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Section I: Executive Summary

Introduction:

The project aims to enhance the John F. Kennedy corridor from Carter Rd to Highway 20 by improving both operational and geometric aspects, with a particular focus on pedestrian safety and non-motorized transportation. Data analysis, including vehicle and pedestrian counts, traffic signal timing plans, and road geometry, will inform comprehensive assessments of current and future conditions. Plans include implementing mixed-use designs to integrate residential and retail areas, creating pedestrian-friendly intersections to facilitate easy access to amenities like retail stores, Hoover Elementary School, and parks, while also ensuring efficient motorized service along the corridor. Overall, the project seeks to balance the needs of pedestrians and motorists while enhancing community connectivity and safety.

Purpose:

This study considers traffic operation and pedestrian accommodations within several intersections of the JFK corridor. The purpose of this report is to evaluate potential benefits and drawbacks associated with each intersection being analyzed to create recommendations as to what best fits each intersection's needs. The focus of the study evaluates the two major intersections, Wacker Dr and John F. Kennedy Rd (JFK), along with Pennsylvania Ave and JFK. Proposed alternative traffic control strategies include changes in traffic signaling and stop sign control on minor street intersections.

Existing Intersections Analysis:

The traffic analysis report provides comprehensive insights into the traffic conditions and intersections along the JFK corridor, focusing on critical intersections, such as Pennsylvania Ave and JFK, Wacker Dr and JFK, as well as minor street intersections. The analysis encompasses various aspects including traffic volumes, level of service (LOS), approach delays, and potential improvements needed for each intersection. The software used to complete this analysis required Highway Capacity Software (HCS) and Synchro, specifically SimTraffic a micro-simulation analysis tool. Along with these analysis tools we used Iowa DOT data from the Iowa Crash Analysis Tool (ICAT) to understand crash data along the corridor and major intersections.

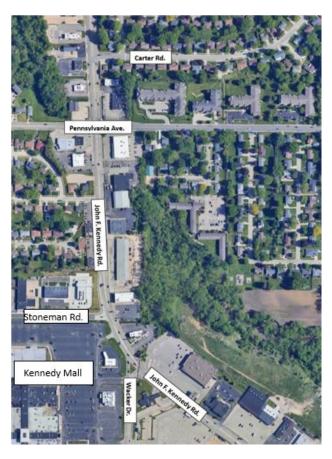


Figure 1. Aerial view displaying the southern portion of the JFK Corridor

At the intersection of Pennsylvania Avenue and JFK, varying levels of service were observed at various times, which include 11am-12pm, 12pm-1pm, 4pm-5pm, 5pm-6pm on Tuesday (February 6th, 2024) and Saturday (February 10th, 2024). Significant differences were noted between the northbound (NB)/southbound (SB) and eastbound (EB)/westbound (WB) directions. Similarly, at the Wacker Dr and JFK intersection, varying LOS and approach delays were observed, particularly for EB/WB traffic. The minor street, Carter Rd. was looked at as a possible area for sidewalk and crosswalk enhancements due to Hoover Elementary School's locatation just Northeast of the Carter Rd and JFK intersection. The LOS of all the intersections mentioned ranged from A to D. The analysis noted potential issues with the software's understanding of intersection geometry, leading to unrealistic delays and LOS ratings. By looking at the analysis, the team was able to determine the critical hour of traffic for each day. The critical hours of traffic found for both Saturday and Tuesday was 12-1 PM.

Additional intersections along the corridor, including Carter Rd, Crestwood Dr, Stoneman Rd, Daykin Ct, and University Ave, were also analyzed. These intersections generally achieved satisfactory LOS ratings of A and B with overall acceptable approach delays, with minimal need for operational or geometric modifications.

Overall, the analysis provides valuable insights into traffic dynamics along the JFK corridor, highlighting areas of congestion and potential improvements needed to optimize traffic

flow and enhance safety. Further studies and assessments are recommended to address specific issues identified, ensuring efficient transportation management and urban planning in the region.

Future Intersections Analysis:

The team conducted a comprehensive analysis of traffic conditions and projections for various intersections, focusing on Pennsylvania Ave and JFK Rd, as well as Wacker Dr and JFK Rd. Utilizing a 1% population growth rate, the group forecasted traffic volumes for 5, 10, and 20 years into the future. At the Pennsylvania Ave and JFK intersection with optimized signaling of the 5-year projection, there are decreases in delays compared to the existing traffic signaling, and the intersection maintains an acceptable level of service (LOS) of C. Optimization strategies effectively minimize overall delay, particularly in the northbound direction. Similar trends are observed in the 10-year projection, with notable improvements in the northbound direction. However, concerns arise in the 20-year projection as certain movements exceed acceptable delay thresholds, when optimizing the 20-year projection it will decrease the delay and allow the intersection to run with a LOS of C which is still acceptable, but this intersection is nearing an unacceptable LOS. This is a sign to look at potential geometric changes in the 20-year window with the delay approaching an unacceptable LOS. Despite improvements in delay, further analysis with sophisticated software is recommended for enhanced projected traffic flow.

Turning to the Wacker Dr and JFK Rd intersection, the 5-year projection demonstrates that existing operational signaling is effective, maintaining an acceptable LOS. Though optimization efforts yield marginal improvements, more sophisticated analysis is required to find significant enhancements. In the 10-year projection, multiple movements experience unacceptable delays, indicating ineffective functionality. Optimization strategies do not substantially improve traffic flow, necessitating further investigation. Similarly, in the 20-year projection, although marginal improvements are observed, several movements still exhibit unacceptable delays. Optimization efforts maintain an overall LOS of C, but more in-depth analysis is required for significant improvements.

Overall, the team's analysis underscores the importance of considering both operational and geometric changes to ensure smooth traffic flow within acceptable parameters as Dubuque's population grows over the next two decades.

Final Design Recommendations:

In the final design recommendations for the JFK Rd corridor, the team proposes a comprehensive set of enhancements to bolster pedestrian safety and optimize traffic flow. To kickstart these improvements, the team suggests utilizing optimization tables provided in the report to update signal timing at the Pennsylvania and JFK intersection. Meanwhile, for the Wacker and JFK intersection; a more sophisticated software system is recommended for further investigation due to minimal improvements observed in most movements.

Addressing pedestrian safety and sidewalk connectivity, the team advocates for the addition of a sidewalk along the west side of JFK from Stoneman Rd to the Wacker Dr and Kennedy Mall intersection. This addition aims to enhance sidewalk connectivity and is

complemented by the reconstruction of sections near the Sunshine Family Restaurant. To facilitate safe pedestrian crossings, the plan involves adding crosswalk markings across the Kennedy Mall entrance and Wacker Dr, along with updating markings across JFK. Additionally, pedestrian pushbuttons are proposed at Wacker Dr and JFK to provide pedestrians with control over signal changes.

To further enhance pedestrian safety, a pedestrian median is advised at the Carter Rd and JFK intersection. This feature will be supplemented by flexible delineators along the sidewalk perimeter, serving to improve safety and discourage cars from encroaching onto pedestrian paths. Moreover, the recommendation includes converting the Carter Rd and Ridge Rd intersection into a 3-way stop, a measure aimed at enhancing safety and traffic management.

In addition to pedestrian-focused enhancements, the proposal also entails adjusted signal timing at major intersections along the corridor's southern portion. These adjustments are intended to reduce overall delay and improve traffic efficiency.

Collectively, these measures represent a comprehensive approach to improving pedestrian infrastructure and traffic flow along the JFK corridor, aligning with the overarching goal of enhancing safety and efficiency for all road users.

Section II: Introduction

This project's objective is to enhance operational and geometric aspects of the John F. Kennedy corridor, particularly focusing on the stretch from Carter Rd to Highway 20. Alongside improvements for motorized vehicles, there's a significant emphasis on enhancing non-motorized transportation, especially pedestrian safety. To assess the corridor comprehensively, data including existing vehicle and pedestrian counts, traffic signal timing plans, and road geometry was utilized. Additionally, the project aimed to evaluate both current and future conditions. Specifically, the city of Dubuque is considering implementing changes aiming for a mixed-use design that integrates residential and retail areas. Given the community layout, it's crucial to create pedestrian-friendly intersections facilitating easy access for residents to nearby amenities such as retail stores, Hoover Elementary School, and parks. Ensuring efficient motorized service along the corridor is also a key consideration alongside pedestrian safety and service levels.

Study Area Description:



Figure 2. Aerial View of Dubuque, IA with JFK Rd highlighted.

Figure 2 (shown above) displays the aerial view of the John F Kennedy Rd. corridor which spans from the NW Arterial to Highway 20. The corridor serves as a key thoroughfare facilitating significant traffic flow.



Figure 3. Aerial view of the section of JFK Rd the project is focused on.

The group decided to focus efforts on improving the pedestrian safety and traffic efficiency of the southern section of JFK (spanning from Carter Rd. to University Ave). JFK Rd serves as a major corridor for the city of Dubuque, with the southern section (shown in Figure 2) running adjacent to the Kennedy Mall. The Kennedy Mall is a center for dining and entertainment with approximately 63 businesses in operation. Additionally, JFK Road serves as a vital route for school children attending Hoover and Kennedy Elementary schools. Just south of Asbury Rd lies Dubuque Fire Station #2, overseeing a traffic light directly across the street, despite not marking an intersection. Further down the road, Our Redeemer Lutheran Church is positioned south of the fire station, contributing to the local community fabric.

Section III: Capacity and Level of Service (LOS) Analysis

Manual Vehicle Counts:

The team conducted comprehensive traffic assessments at two critical intersections: John F. Kennedy Road (JFK) and Pennsylvania Ave and Wacker Dr and JFK. Vehicular and pedestrian counts from both Tuesday, February 6th, and Saturday, February 10th, were utilized in the analysis. The video footage was captured during the morning and evening peaks, and the team manually counted the vehicles from 11 AM to 1 PM and from 4 PM to 6 PM, respectively. This comprehensive approach allowed for a thorough examination of traffic and pedestrian flow during peak hours on different days of the week. The limitations of this method of getting traffic counts were found when looking at Wacker and JFK with minimal vision from the footage showing SB left movements, along with no vision of the right turn movements off JFK onto Wacker on the Tuesday video footage.



Figure 4. Aerial view displaying the location of cameras used to analyze the JFK Rd. and Pennsylvania Ave. intersection.



Figure 5. Aerial view displaying the location of cameras used to analyze the JFK Rd. and Wacker Dr. intersection.

The analysis of the Wacker and JFK intersection on Tuesday holds several assumptions. Firstly, due to limitations in the amount of camera angles provided, observations for southbound traffic on JFK turning left into PetSmart parking lot were unavailable during Tuesday's analysis. The team gathered data from Saturday's peak hours (counting 20 and 8 vehicles per hour for the evening peak, with 13 and 13 vehicles per hour for the morning peak) to accurately represent Tuesday's corresponding peak traffic periods. Secondly, right-hand turns from JFK onto Wacker were determined using traffic volume data provided by the Iowa Department of Transportation (DOT). Lastly, there was limited ability for the team to count the vehicles leaving the Kennedy Mall heading eastbound near the intersection of Wacker and JFK. We extrapolated Saturday's peak traffic analysis counts for this movement and included the values in Tuesday's analysis.

For both Tuesday and Saturday's analysis, the team was unable to view the number of vehicles turning right out of the PetSmart parking lot. To address this, the left-hand turn quantity was multiplied by 1.2 to approximate the right-hand turn quantity. This decision was made based on the understanding that northbound traffic on JFK from Wacker Dr typically experiences a 20% higher volume compared to the southbound traffic, indicating that travelers are more likely to go northbound. Under these assumptions, we aimed to ensure an accurate assessment of traffic dynamics at the Wacker and JFK intersection, thereby providing valuable insights for urban planning and transportation management.

Two-Way Stop Control:

The Two-Way Stop Control (TWSC) HCS was used to determine the level of service of minor street intersections (Carter Rd, St Anne Dr, Ridge Rd, Stoneman Rd, Crestwood Dr, University Ave, Daykin Ct) with JFK. The assumptions used for this analysis included using AADT data for volume of vehicles per hour along each intersection. The AADT was used for

these minor intersections as there are no cameras along these spots. Along with an excel sheet using MUTCD turning movement percentiles for arterial and collector roads. As for the pedestrian information in this analysis an assumption was made based on a reference relating to percentage of children who walk to school in the United States. This is from the National Center for Safe Routes to School. The team is using this percentage and multiplying it by the number of children that attend Hoover Elementary School to estimate the number of pedestrians crossing Carter Rd.

Crash Analysis:

In addition to completing manual counts, the team reviewed the Average Annual Daily Traffic (AADT) at all the sections of JFK to observe where heavy traffic was occurring. The team noted which areas of the corridor had the most collisions. Using the Iowa Crash Analysis Tool (ICAT) the intersection of Wacker Dr. and JFK was analyzed. There have been 8 crashes at the intersection since the beginning of 2023, none resulting in serious injury or fatality. The vast majority of incidents were side-swipe style collisions. Two of the 8 incidents involved vehicles running lights. The report also noted that 3 of the remaining 6 crashes were caused by improper or erratic lane change. Unclear lane markings (specifically when taking a right and then immediate left onto JFK) may have contributed to the collisions.

In addition, the intersection at Pennsylvania Ave and JFK was analyzed. Since the beginning of 2023, there have been 35 crashes that have taken place, none of which resulted in a fatality. Over half of the crashes that occurred at the intersection were the result of drivers losing control of their cars and failing to yield the right of way when making a left turn. Additionally, there have been 4 crashes where drivers have failed to yield from traffic making a right turn from the driveway coming out of Domino's heading eastbound onto Pennsylvania Ave. This could be due to the traffic backup that exists at this intersection because the phasing is not optimized at the intersection. The intersection of JFK and Carter Rd was also analyzed. There have been 13 crashes, all minor with no fatalities. Most of the crashes occurred due to either a driver failing to yield or losing control. The majority of crashes that occurred at the three intersections took place between 10 AM and 4 PM.

Synchro:

On Synchro, the team modeled the section of road from HWY 20 to Carter Rd for the existing conditions. The team modeled this section of JFK to mirror real world conditions, namely intersection geometry. All intersections were modeled to have the correct intersection control. At the signalized intersections, signal timing was also modeled correctly. In the model, eight different scenarios were created (corresponding to 8 peak hours) to see the effect traffic had on the corridor. The traffic volumes and turning movements at the various intersections were inputted into model based off the data collected from the traffic videos at the intersections of JFK Rd and Pennsylvania Ave as well as JFK and Wacker Dr. The traffic volumes at the intersections between JFK and some of the minor streets were also added using the calculated values from the excel spreadsheet.

In the Synchro analysis, the team ran 60 different simulation runs for each of the eight scenarios and gathered the data from each of those simulations for the existing conditions and for 5 years from now. Simulation runs were also done for two alternatives to see the impact of what the delay would be if the alternatives were put into place. The data can be seen in the reports for each of the scenarios for the existing conditions and the 5-year projected growth which includes the total amount of delay per vehicle (seconds) denied delay (hours), total delay (hours), stop delay (hours), travel distance (miles), travel time (hours), and density (ft/vehicle) for each of the intersections in the corridor as well as the whole corridor itself.

Highway Capacity Analysis Methods:

Tuesday, February 6th, 2024:

Table 1. Pennsylvania Ave and JFK Rd Tuesday Noon-1PM HCS Existing Conditions

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roice Mode	rixed	Simult. Gap N/S	On	Red	1.2	10.0	[1.1	1.2	[0.0	1.2		6	0		¥
Timer Results				EBI		EBT	WB	1	WBT	NBI		NBT	SBI		SBT
Assigned Phase	e			3		8	7	_	4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1	\neg	4.0
Phase Duration	hase Duration, s					18.8	10.5	5	17.5	11.8		23.9	10.8	3	22.9
Change Period,	hange Period, (Y+R c), s					5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Head	dway (/	MAH), s		3.1		3.1	3.1	\neg	3.1	3.1	\neg	3.1	3.1	\neg	3.1
Queue Clearan	ce Time	e (a s), S		6.7		12.6	4.2		7.0	5.6		16.9	4.1		13.0
Green Extensio	n Time	(ge), S		0.2		1.0	0.1	\neg	1.1	0.3		1.8	0.1	\neg	0.5
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Cycle Queue C Green Ratio (a		e nine (gr), s		0.30	0.21		0.28	0.19		0.38	0.29	0.29	0.37	0.28	0.28
Capacity (c), v				435	372		278	358	303	385	544	521	292	517	475
Volume-to-Capa		atio (V)		0.381	0.811		0.287	0.459		0 401	0.843		0.307	0.684	
		t/In (95 th percentile	1)	80	192		38	95	50.294	62	231	218	36	191	177
		eh/In (95 th percentile		3.1	7.5		1.5	3.7	1.9	2.4	9.0	8.7	1.4	7.5	7.1
	V 71 -	RQ) (95 th percent		0.44	0.00		0.33	0.00		0.62	0.00	0.00	0.30	0.00	0.0
Uniform Delay (17.7	24.0		18.7	22.9	0.10	14.6	21.3	21.3	15.8	20.6	20.
				0.2	1.7		0.2	0.3	0.2	0.2	0.9	0.9	0.1	2.2	2.5
	icremental Delay (d z), s/veh iitial Queue Delay (d s), s/veh				0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ontrol Delay (d), s/veh				25.7		18.9	23.3		14.7	22.1	22.2	16.0	22.8	23.
	evel of Service (LOS)				C		В	C	C	В	C	C	В	C	C
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Intersection De							1.8						C		
Multimodal Re	sults				EB			WB			NB			SB	
Pedestrian LOS	Score	/LOS		2.28	3	В	2.28	8	В	2.10)	В	1.91		В
Bicycle LOS Sc	ore / LO	OS		1.26	3	Α	1.04	4	Α	1.20)	Α	1.17	7	Α

The existing conditions at Pennsylvania Ave and JFK Rd. generate acceptable levels of service, which was to be expected considering it is a traditional four-leg intersection. All four of the left turns at the intersection are protected and permitted. It is important to note that vehicles approaching the intersection do so at a significant decline (inherently making braking more difficult).

HCS Signalized Intersection Results Summary General Information Intersection Information 1.000 Agency Duration, h Analysis Date 2/15/2024 Analyst Area Type Other PHF 1.00 Time Period Jurisdiction John F Kennedy Analysis Year 2024 Analysis Period 1> 12:00 Urban Street TUESDAY Intersection (Penn-JFK)_existingFINA 12-1pm Penn/JFK Intersection File Name Project Description Demand Information FB WR SB Approach Movement Т R Т R Т 97 562 166 197 105 80 164 89 127 649 90 174 Demand (v) veh/h Signal Information 66.6 Reference Phase 62 Reference Point Green Yes Simult. Gap E/W On Fixed Simult. Gap N/S On Timer Results EBL EBT WBL WBT NBL NBT SBL SBT Assigned Phase 4 0 Case Number 11 4 0 11 3.0 4 0 Phase Duration, s 19.3 10.6 17.9 11.8 25.7 10.9 24.8 Change Period, (Y+Ro), s 5.2 5.2 5.2 5.2 5.2 5.1 5.2 5.1 Max Allow Headway (MAH), s 3 1 3.1 3 1 3.1 3 1 3.1 3.1 3 1 Queue Clearance Time (g s), s 6.9 13.0 4.3 7.2 5.7 17.1 4.1 13.2 Green Extension Time (g e), s 0.2 0.1 1.0 0.3 3.4 0.1 3.4 Phase Call Probability 0.95 1.00 0.77 1.00 0.94 1.00 0.81 1.00 Max Out Probability 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 Movement Group Results R R Assigned Movement 8 14 16 12 Adjusted Flow Rate (v), veh/h 166 302 80 164 89 154 459 439 90 353 327 Adjusted Saturation Flow Rate (s), veh/h/ln 1767 1746 1856 1572 1838 1856 1776 1705 Queue Service Time (g s), s 11.0 11.2 5.2 15.1 Cycle Queue Clearance Time (g c), s 4.9 11.0 5.2 15.1 11.2 0.29 0.21 0.27 0.19 0.19 0.40 0.31 0.38 Green Ratio (g/C) 0.31 0.30 0.30 355 Capacity (c), veh/h 428 301 394 576 551 300 0.294 0.462 0.796 0.813 0.296 0.392 0.797 0.641 0.646 Volume-to-Capacity Ratio (X) 0.388 0.299 Back of Queue (Q), ft/ln (95 th percentile) 100 Back of Queue (Q), veh/ln (95 th percentile 3.3 7.8 1.6 3.9 2.0 2.5 9.3 8.9 1.4 6.8 Queue Storage Ratio (RQ) (95 th percentile 0.47 0.00 0.35 0.00 0.46 0.63 0.00 0.00 0.31 0.00 18.6 25.1 19.6 24.0 23.2 14.4 15.7 20.5 Uniform Delay (d 1), s/veł 21.1 20.4 Incremental Delay (d 2), s/veh 0.3 0.2 0.2 Initial Queue Delay (d 3), s/veh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 19.8 24.3 23.4 15.8 Control Delay (d), s/veh 18.8 26.7 14.6 21.8 21.8 20.7 20.8 Level of Service (LOS) ВС В С С В В С 23.0 20.7 Approach Delay, s/veh / LOS Intersection Delay, s/veh / LOS Multimodal Results EB WB NB SB Pedestrian LOS Score / LOS 2 28 2 28 2 10 1 91 Bicycle LOS Score / LOS 1.26 1.04 1.20

Table 2. Pennsylvania Ave and JFK Rd Tuesday Noon-1PM HCS Optimized Conditions

Analysis of the traffic conditions at the Pennsylvania Ave and JFK intersection on Tuesday from 12PM-1PM are shown above. The existing conditions were optimized to minimize overall delay and successfully did so in the NB/SB directions (with minimal increases in the EB/WB directions). Before and after optimization, the intersection maintained an acceptable level of service, going from an average delay of 21.8 seconds/vehicle to 21.4 seconds/vehicle after optimization (both delays falling into the LOS C range). The intersection experiences a level of service of B for all left turns, and C for all through movements. Pedestrian level of service is not negatively affected by the adjusted signal timing.

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Timer Results				EBI		EBT	WBI	L	WBT	NBI		NBT	SBI		SBT
Assigned Phase	е					4			8	5		2	1		6
Case Number						10.0			12.0	1.1		4.0	1.1		4.0
Phase Duration	1, S					15.4			6.7	10.0)	25.0	5.9		20.9
Change Period	hange Period, (Y+R c), s					5.5			5.5	5.0		5.5	5.0		5.5
Max Allow Head	ax Allow Headway (MAH), s					3.3			3.2	3.1		3.1	3.1		3.1
Queue Clearan	ueue Clearance Time (g s), s					9.1		\neg	2.2	5.2		15.6	2.3		10.1
Green Extension	n Time	(ge), s				0.9		\neg	0.0	0.2		3.8	0.0		3.8
Phase Call Pro	bability				-	1.00			0.20	0.92	2	1.00	0.17		1.00
Max Out Proba	bility					0.00		\Box	0.00	0.00		0.00	0.00		0.00
		14						W			NB			0.0	
Movement Gro	•	sults			EB				_					SB	_
Approach Move				L	T	R	L	Т	R	L	T	R	L	T	R
Assigned Move				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow I				180	247		8	_	7	167	547	545	13	331	297
		ow Rate (s), veh/h/l	In	1810	1758		1853		1650	1810	1900	1893	1810	1900	168
Queue Service				4.8	7.1		0.2		0.2	3.2	13.6	13.6	0.3	7.9	8.1
Cycle Queue C		e Time (g c), s		4.8	7.1		0.2		0.2	3.2	13.6	13.6	0.3	7.9	8.1
Green Ratio (g				0.19	0.19		0.02		0.02	0.41	0.37	0.37	0.31	0.29	0.29
Capacity (c), v				340	331		42		38	420	699	697	206	552	489
Volume-to-Cap				0.529	0.747		0.187		0.190	0.398	0.782	0.782	0.063	0.599	0.60
		t/ln (95 th percentile		82	120		4		4	47	190	189	4	135	122
		eh/ln (95 th percenti		3.3	4.8		0.2		0.2	1.9	7.6	7.6	0.2	5.4	4.9
		RQ) (95 th percent	tile)	0.16	0.24		0.10		0.09	0.24	0.38	0.38	0.07	0.27	0.2
Uniform Delay				19.5	20.4		25.5		25.5	11.3	14.9	14.9	14.1	16.2	16.
Incremental De				0.5	1.3		8.0		0.9	0.1	0.4	0.4	0.0	0.4	0.5
Initial Queue De		**		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (19.9	21.7		26.3		26.4	11.4	15.3	15.3	14.1	16.6	16.7
Level of Service	. ,			В	С		С	_	С	В	В	В	В	В	В
	• •			20.9		С	26.3		С	14.8	3	В	16.6		В
Approach Dela	ntersection Delay, s/veh / LOS					16	5.5						В		
	,,														
Intersection De					ED			10/5			MD			Ç.D	
	sults	/108		2.29	EB	В	2.29	WI	3 B	1.89	NB	В	2.09	SB	В

Table 3. Wacker Dr and JFK Rd Tuesday Noon-1PM HCS Existing Conditions

The existing conditions at the Wacker Dr and JFK Rd intersection (displayed above in Table 3) show that vehicles experience an intersection delay level of service of B. By and large delay at the intersection is low, except for vehicles going westbound (exiting the PetSmart parking lot). NB/SB traffic experiences an average approach delay of between 14.8 and 16.6 seconds/vehicle while the EB/WB traffic sees approach delays of between 20.9 and 26.3 seconds/vehicle. Considering vehicles exiting the PetSmart parking lot have by far the lowest volume (and there is an alternative parking lot exit south of the intersection) it is expected that this direction would see significantly higher delay than other directions.

	-	HUS	Sign	Ialize	u inte	ISECL	IOII K	esu	its su	mmar	_				
General Inform	nation								Interse	ction In	formation	on	l J	dow l	KIU.
Agency									Duratio		1.000			4.7	
Analyst				Analys	is Date	2/20/2	024		Area Ty		Other		4		
Jurisdiction				Time F		212012	.524		PHF	PC	1.00				A
Urban Street		Wacker/JFK		******	is Year	2024				s Period		00			
Intersection		Wacker/JFK NOON	1DM	File Na			DAV Int	0.000	tion (Wa				- 100		
Project Descrip	tion	Wacker/JFK TUESI		I lie ive	aine	TIOES	DAT IIII	CISC	JUOII (VVZ	CKCI-JI I	()_exist	iligi liv	-	1 - 44	le (*
Demand Inforr	nation				EB			10	/B		NB			SB	
						T .	+ -	_			_	T 5		T	R
Approach Move				L	T 3	R	L	_	T R	L	T	R	L	_	
Demand (v), v	eh/h		_	360	3	64	4		5 6	79	511	5	13	415	21:
Signal Informa	tion						IJ.	_	8		77				
Cycle, s	52.3	Reference Phase	2	1	7	l	12.4.2	_ 🗠	月			.	512		7
Offset, s	0	Reference Point	End		1	1	<u> </u>	°				1	2	3	Z
Uncoordinated	Yes	Simult. Gap E/W	On	Green		4.1	15.1	9.							A
				Yellow		0.0	4.0 1.5	3.				۲. ۲	<u> </u>	- ^∵	V
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	10.0	1.5	12.	J ∠.	[0.0		6	0	7	
Timer Results				EBL		EBT	WB		WBT	NB	L	NBT	SBI		SBT
Assigned Phase	e					4			8	5		2	1		6
Case Number						10.0			12.0	1.1		4.0	1.1		4.0
Phase Duration	•			_	_	15.1	_	_	6.7	10.	_	24.7	5.9		20.6
	hange Period, (Y+R c), s					5.5		\rightarrow	5.5	5.0	_	5.5	5.0	-	5.5
	ax Allow Headway (MAH), s					3.3	_	-	3.2	3.1	_	3.1	3.1	_	3.1
	ax Allow Headway (MAH), s ueue Clearance Time (g s), s					9.0	_	_	2.2	5.1	_	15.3	2.3		10.0
Green Extension				_		0.6	_	-	0.0	0.2	_	3.7	0.0	_	2.9
Phase Call Pro		(9=), 5				1.00	_	_	0.20	0.9	-	1.00	0.17	-	1.00
Max Out Proba					_	0.09		_	0.00	0.0	_	0.01	0.00	-	0.34
	,														
Movement Gro	up Res	sults			EB			W	3		NB			SB	
Approach Move	ment			L	Т	R	L	Т	R	L	T	R	L	Т	R
Assigned Move	ment			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow I	Rate (v), veh/h		180	247		8		7	166	542	540	13	331	297
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1810	1758		1853		1650	1810	1900	1893	1810	1900	168
Queue Service	Time (g	g s), S		4.7	7.0		0.2		0.2	3.1	13.3	13.3	0.3	7.9	8.0
Cycle Queue C	learanc	e Time (gε), s		4.7	7.0		0.2		0.2	3.1	13.3	13.3	0.3	7.9	8.0
Green Ratio (g	/C)			0.18	0.18		0.02		0.02	0.41	0.37	0.37	0.31	0.29	0.29
Capacity (c), v	reh/h			333	324		42		38	421	697	695	208	548	486
Volume-to-Cap	acity Ra	itio (X)		0.540	0.763		0.186		0.18	0.394	0.777	0.777	0.063	0.603	0.61
Back of Queue	(Q), fl	t/ln (95 th percentile)	81	119		4		4	46	185	185	4	134	12
Back of Queue	(Q), ve	eh/ln (95 th percenti	le)	3.3	4.8		0.2		0.2	1.8	7.4	7.4	0.2	5.4	4.8
Queue Storage	Ratio (RQ) (95 th percent	ile)	0.16	0.24		0.10		0.09	0.24	0.37	0.37	0.07	0.27	0.2
Uniform Delay	(d1), s	/veh		19.4	20.3		25.2		25.2	11.2	14.7	14.7	14.0	16.1	16.
Incremental De				0.5	1.4		0.8		0.9	0.1	0.4	0.4	0.0	0.4	0.5
Initial Queue De	elay (d	3), s/veh		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/ve	eh		19.9	21.8		26.0		26.1	11.3	15.1	15.1	14.0	16.5	16.
Level of Service	(LOS)			В	С		С		С	В	В	В	В	В	В
Approach Delay	, s/veh	/LOS		21.0		С	26.0		С	14.	6	В	16.5	5	В
Intersection De						16	5.4						В		
Multimodal Re					EB			W	3		NB			SB	
Pedestrian LOS	Score	/LOS		2.29		В	2.29		В	1.8	9	В	2.09)	В
. cocomian Ecc												A			

Table 4. Wacker Dr and JFK Rd Tuesday Noon-1PM HCS Existing Conditions Optimized

Analysis of the optimized traffic conditions at the Wacker Dr and JFK intersection on Tuesday from 12 PM-1PM are shown above. The existing conditions were optimized to minimize overall delay and successfully did so in the NB/SB and WB directions (with a minimal increase of .1 seconds/vehicle in the EB directions). Before and after optimization the intersection maintained an acceptable level of service, going from an average delay of 16.5 seconds/vehicle to 16.4 seconds/vehicle after optimization (both delays falling into the LOS B range). The intersection sees a level of service of B for all left turns apart from the WB direction (which receives a C), and C for all through movements. Pedestrian level of service is not negatively affected by the adjusted signal timing.

General Inform	nation								Intersec					410	de lu
Agency									Duration	, h	1.000	1	-	4+3	
Analyst					is Date	5/1/20)24		Area Typ	e	Other				
Jurisdiction				Time F	Period				PHF		1.00		2		
Urban Street		JFK Rd		Analys	is Year	2024			Analysis	Period	1> 7:0	00	7		
Intersection				File Na	ame	Wack	er_Penr	n Exist	ing Upda	te 12-1.	xus			111	
Project Descrip	tion								-				Ti S	4144	114
Demand Inforr	nation				EB			W	В		NB			SB	
Approach Move	ement			L	T	R	L	T	R	L	T	R	L	T	F
Demand (v), v	eh/h			174	148	126	103	13	0 72	140	717	87	88	760	15
Signal Informa	tion				6			2	- 2	1 2	<u></u>	. ,	L.	_	Ð
Cycle, s	66.5	Reference Phase	2		5	150	Z 51	2 M		R	Ş	`	/× , -	- ^ .∥	Y
Offset, s	0	Reference Point	End	Green	5.6	0.8	20.2	6.0	1.5	11.6			2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	4.0		4.0			NZ.	_	7
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2		1.2		5	6	7	Z
Timer Results				EBI		EBT	WB	L	WBT	NBI		NBT	SBL		SBT
Assigned Phase	e			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1	\neg	3.0	1.1		4.0	1.1		4.0
Phase Duration	l. S			12.6		18.3	11.3	-	16.8	11.7	,	26.2	10.8		25.3
Change Period	,	c) S		5.2	-	5.2	5.2		5.2	5.2	_	5.1	5.2	_	5.1
	ax Allow Headway (MAH), s					3.2	3.1	_	3.2	3.1	_	3.1	3.1	_	3.1
	ueue Clearance Time (g s), s					12.2	5.0	\rightarrow	6.1	5.4	_	14.8	4.1		17.6
	Rueue Clearance Time ($g \circ$), s Green Extension Time ($g \circ$), s				_	0.9	0.1		0.9	0.2	_	3.7	0.1	_	2.6
Phase Call Pro		(g e), s		1.00	-	1.00	0.8	+	1.00	0.92	$\overline{}$	1.00	0.80	_	1.00
Max Out Proba				0.00	_	0.00	0.00	_	0.00	0.92		0.01	0.00		0.45
Max Out Proba	Dility			0.00	,	0.00	0.00	,	0.00	0.00	,	0.01	0.00	,	0.45
Movement Gro	un Res	ults			EB			WB			NB			SB	
Approach Move		, units		L	T	R	L	T	I R	L	T	R	L	Т	TR
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow F		\ veh/h		174	274	10	103	130		139	407	392	88	468	44
), ven/n ow Rate (s), veh/h/l	n	1767	1714		1767	1856		1767	1856	1785	1767	1856	174
							11.21	1000		3.4					
Queue Service		, ,.		5.2	10.2		3.0	4.1	2.6		12.8	12.8	2.1	15.6	15.
Cycle Queue C		e τime (g ο), s		5.2	10.2		3.0	4.1	2.6	3.4	12.8	12.8	2.1	15.6	15.
Green Ratio (g				0.29	0.20		0.26	0.17		0.40	0.32	0.32	0.39	0.30	0.3
Capacity (c), v				448	338		283	324		323	589	566	322	565	53
Volume-to-Cap				0.389	0.811		0.364	0.40		0.431	0.692	0.693	0.273	0.828	0.8
		t/In (95 th percentile	_	90	184		54	80	43	56	217	205	36	292	27
		eh/In (95 th percenti		3.5	7.2		2.1	3.1	1.7	2.2	8.5	8.2	1.4	11.4	10
Queue Storage	Ratio (RQ) (95 th percent	ile)	0.50	0.00		0.47	0.00	0.37	0.56	0.00	0.00	0.30	0.00	0.0
Uniform Delay ((d 1), S	/veh		18.9	25.5		20.1	24.4	23.7	15.3	19.9	19.9	14.7	21.5	21
Incremental De	lay (d 2), s/veh		0.2	1.8		0.3	0.3	0.2	0.3	0.5	0.5	0.2	6.0	6.
Initial Queue De	elay (d	з), s/veh		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Control Delay (d), s/ve	eh		19.1	27.4		20.3	24.7	23.9	15.6	20.3	20.4	14.9	27.5	27
Level of Service				В	С		С	С	С	В	С	С	В	С	C
Approach Delay		/LOS		24.2		С	23.0	i T	С	19.6	5	В	26.6	; T	С
Intersection De							3.3					_	C		
	,														
Multimodal Re	sults				EB			WB			NB			SB	
Pedestrian LOS	Score	/LOS		2.28	3	В	2.28	3	В	2.10		В	1.91		В
Bicycle LOS So	ore / LC)S		1.23	3	Α	0.99		Α	1.27	7	Α	1.31		Α
	Lycie Los scole / Los				_									_	_

Table 5.Pennsylvania Ave and JFK Rd Saturday Noon-1PM HCS Existing Conditions

The table provides an overview of the existing conditions during Saturday from 12-1 pm, showcasing results across various movement groups. Notably, the absence of data in the EB right movement is explained by the apparent configuration at the top right of the table indicating synchronization between the through movement and the right movement, consolidating data from both sections. Of particular significance for analysis are several key variables: Control Delay, Level of Service (LOS), Approach Delay alongside corresponding LOS, and the overall intersection delay and LOS. Examination of these variables reveals that the Pennsylvania and JFK intersection operates at an average LOS of C, which falls within acceptable parameters. There is no indication of approaching an undesirable LOS of D or exceeding a delay threshold of 35 s/veh. In summary, the existing operational signaling demonstrates effective functionality, ensuring smooth traffic flow within acceptable parameters.

		HCS	Sign	nalize	d Inte	rsect	ion R	esult	s Sun	nmary					
General Inform	ation							T.	ntersec	tion Inf	ormatic	on.		dael	WIU.
Agency	iuuon							\rightarrow	Duration.		1.000			4.1	
Analyst				Analys	ie Dato	5/1/20	24	_	Area Typ		Other		4		
Jurisdiction				Time F		3/1/20	124		PHF	e .	1.00		- 1		<u>`</u>
Urban Street		JFK Rd		_	is Year	2024				Desired	1> 7:0	20			
		JFK R0					D	_	Analysis		1		- 60		
Intersection				File N	ame	Wack	er_Penr	1 Existi	ng Upda	te 12-1	(Overal	I Dela	- 4	ንተተ	
Project Descript	tion							-						N WY	KID.
Demand Inform	nation				EB		$\overline{}$	WE			NB			SB	
Approach Move	ment			L	T	R	L	T	R	L	Т	R	L	T	R
Demand (v), v	eh/h			174	148	126	103	130	72	140	717	87	88	760	150
Signal Informa					6		<u>U</u>	1 2	_ 2	1 2	₽.				4
Cycle, s	68.4	Reference Phase	2		5	500	a 50	2 L	Æ	R	E.,	ነ "	, _	- ∕`,	~
Offset, s	76	Reference Point	End	Green	5.7	0.8	21.7	6.0	1.0	12.5				,	
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	4.0	0.0	4.0		_	N.	_	_
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		6	0	7	Δ
Timer Results				EBI		EBT	WB		WBT	NBI		NBT	SBI		SBT
Assigned Phase				3	-	8	7	-	4	1	-	6	5	-	2
Case Number				1.1	_	4.0	1.1	-	3.0	1.1	_	4.0	1.1	_	4.0
					_			_						_	
Phase Duration	,			12.2 5.2	-	18.6	11.2	_	17.7	11.7		27.6	10.9	_	26.8
	nange Period, (Y+R c), s				_	5.2	5.2	_	5.2	5.2	_	5.1	5.2	_	5.1
	ax Allow Headway (MAH), s				_	3.2	3.1	_	3.2	3.1	_	3.1	3.1	_	3.1
Queue Clearan				7.4		12.5	5.1	_	6.2	5.4	_	15.0	4.2	_	17.8
Green Extensio		(ge), s		0.0		8.0	0.2	-	0.9	0.3	_	3.7	0.2	_	3.7
Phase Call Prob	bability			1.00)	1.00	0.86	3	1.00	0.93	3	1.00	0.81	1	1.00
Max Out Probal	bility			1.00		0.01	0.00		0.00	0.00		0.00	0.00		0.00
Movement Gro	un Res	uilts			EB			WB			NB			SB	
Approach Move		74110		L	T	R	L	Т	R	L	T	R	1	Т	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow F		\ vale/le		174	274	10	103	130	72	139	407	392	88	468	442
		ow Rate (s), veh/h/l	_	1767	1714		1767	1856	1572	1767	1856	1785	1767	1856	1749
			"		10.5		3.1	4.2	2.7	3.4	13.0	13.0	2.2	15.8	***
Queue Service Cycle Queue C				5.4	10.5		3.1	4.2	2.7	3.4	13.0	13.0	2.2	15.8	15.8
Green Ratio (g		e inne (gc), s		0.29	0.20		0.27	0.18	0.18	0.42	0.33	0.33	0.40	0.32	0.32
Capacity (c), v				443	337		279	340	289	328	612	589	330	591	557
Volume-to-Capa		atio (X)		0.393	0.812		0.370	0.382	_	0.425	0.666	0.667	0.267	0.793	0.79
		t/In (95 th percentile	١	94	192		55	82	44	57	219	208	36	269	251
		eh/In (95 th percenti		3.7	7.5		2.2	3.2	1.7	2.2	8.6	8.3	1.4	10.5	10.0
		RQ) (95 th percent		0.52	0.00		0.48	0.00	0.38	0.57	0.00	0.00	0.30	0.00	0.00
Uniform Delay (ne)	19.6	26.4		20.4	24.6	24.0	15.2	19.8	19.8	14.6	21.4	21.4
Incremental Del				0.2	1.8		0.3	0.3	0.2	0.3	0.4	0.4	0.2	0.9	1.0
Initial Queue De				0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (**		19.8	28.2		20.7	24.9	24.2	15.4	20.2	20.2	14.7	22.3	22.4
Level of Service				В	С		С	С	С	В	С	С	В	С	С
Approach Delay				25.0	_	С	23.3	3	С	19.5		В	21.7		C
Intersection Del							1.6						C		
Multimodal Re					EB			WB			NB			SB	
	destrian LOS Score / LOS					В	2.28	3	В	2.10		В	1.91		В
Pedestrian LOS	Score	/ LUS		2.28	_		2.20	_	ь	2.10	,	ь	1.9		

Table 6.Pennsylvania Ave and JFK Rd Saturday Noon-1PM HCS Existing Conditions Optimized

Displayed in the table above are the optimized results for the Pennsylvania and JFK intersection during Saturday from 12-1 pm, building on the previously examined existing conditions. Significantly, improvements are evident, particularly in the total intersection delay, which has decreased by 1.7 s/veh. On closer examination, it becomes apparent that while the control delay and approach delay have increased across certain movements, they have decreased notably from others. Noteworthy is the reduction of 5.2 s/veh in the control delay for SB through movements. This optimization strategy strategically manages delay in each direction, effectively aligning with the traffic volume dynamics of the intersection. In essence, these optimizations contribute to enhancing traffic flow within the intersection, exemplifying a targeted approach to delay management across various movement directions.

General Inform	ation								Interse	tion Inf	ormatio	on	1 2	4244	HIU.
Agency									Duration		1.000			411	
Analyst				Analys	is Date	5/1/20	024		Area Ty	oe .	Other	r	-		
Jurisdiction				Time F	Period				PHF		1.00				
Urban Street		JFK Rd		Analys	is Year	2024			Analysis	Period	1> 7:	00	70		
Intersection		JFK/Wacker		File Na			er Penn	Exis	sting Upda		xus			ጎተት	
Project Descript	ion						_						1	4144	Þľ
Damand Inform	4:				EB			14	/B		NB			SB	
Demand Inform						T 5		_		+ -					
Approach Move				L 389	16	71	L	-	T R 4 14	L 11C	T	R 4	13	498	35 35
Demand (v), ve	en/n			389	16	/1	12		4 14	116	536	4	13	498	3
Signal Informat	tion				IJ	\top		Т	5_	\top					
Cycle, s	74.4	Reference Phase	2	1		54	2 A	"⊨	7		1	>	1	-	~
Offset, s	0	Reference Point	End	Green	1 9	4.5	24.1	13	7.8 4.6	0.0		1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	Off	Yellow		0.0	4.0	3.		0.0		< 4		7	+
Force Mode	Fixed	Simult. Gap N/S	Off	Red	1.5	0.0	1.5	2.		0.0		5	6	7	
				ED!	-	- DT	Lun		WOT	L NE		NOT	0.01		0.07
Timer Results				EBL	-	EBT 4	WBI	-	WBT	NBI	-	NBT	SBL	-	SBT
Assigned Phase	:			_	_			-	8	5	_	2	1	+	6
Case Number					-	10.0		-	12.0	2.0		4.0	2.0	+	4.0
Phase Duration,	hange Period, (Y+R c), s				+	23.3	-	-	10.1	11.4 5.0	-	34.1	6.9	\rightarrow	29.6
thange Period, (Y+R o), s Max Allow Headway (MAH), s				<u> </u>	-	5.5 3.3	-	\dashv	5.5 3.2	3.1	-	5.5 3.0	5.0 3.1	-	5.5 3.2
Queue Clearanc				\vdash	+	16.9	_	-	2.6	6.8	_	9.8	2.6	+	21.8
Green Extension				-	-	0.9	_	\rightarrow	0.0	0.0	-	1.0	0.0	-	2.1
Phase Call Prob		(g e), s		_	_	1.00	_	\rightarrow	0.46	0.1		1.00	0.0	-	1.00
Max Out Probab				\vdash	+	0.00		-	0.00	0.00	_	0.00	0.00		0.00
	,														
Movement Gro	•	ults			EB			W	_		NB			SB	_
Approach Move				L	Т	R	L	Т	R	L	Т	R	L	Т	F
Assigned Mover				7	4	14	3	8	18	5	2	12	1	6	1
Adjusted Flow R		**		117	359	_	16		14	116	270	270	15	524	45
		ow Rate (s), veh/h/l	n	1767	1731	-	1788		1576	1767	1856	1851	1767	1856	15
Queue Service				4.0	14.9	-	0.6	_	0.6	4.8	7.8	7.8	0.6	19.8	19
Cycle Queue Cl		e Time (gε), s		4.0	14.9	-	0.6		0.6	4.8	7.8	7.8	0.6	19.8	19
Green Ratio (g/	_			0.24	0.24		0.06		0.06	0.09	0.38	0.38	0.03	0.32	0.3
Capacity (c), ve		P- (34)		424	415		112		99	151	713	711	44	601	51
Volume-to-Capa				0.275	0.866		0.141		0.144		0.379	0.379	0.335	0.871	0.8
	. ,.	/In (95 th percentile		74	260		12		11	97	142	138	12	295	25
		eh/ln (95 th percenti	_	2.9	10.1		0.5		0.4	3.8	5.5	5.5	0.5	11.5	10
		RQ) (95 th percent	iie)	0.15	0.52		0.27		0.25	0.19	0.28	0.28	0.02	0.59	0.
Uniform Delay (23.1	27.2		33.1		33.1	33.4	16.5	16.5	35.8	23.8	23
Incremental Del		,.		0.1	3.0		0.2		0.2	3.1	0.1	0.1	0.9	0.9	1.
Initial Queue De				23.2	0.0 30.2		0.0 33.3		33.3	0.0 36.5	16.7	0.0 16.7	0.0 36.6	24.6	24
Control Delay (- /-	511					_			-				24.6 C	24
Level of Service		11.08		C 28.5	С	С	C 33.3		C	D 20.2	В	C	D 24.9		
Approach Delay				26.5	'		4.4		C	20.2					C
Intersection Dela	ay, s/ve	en / LOS				2	4.4						С		
Multimodal Res	sults				EB			W	В		NB			SB	
Pedestrian LOS		/LOS		2.30		В	2.30	_	В	1.90		В	2.10		В
	cycle LOS Score / LOS				-	Α	0.51		Α	1.03		Α	1.20	$\overline{}$	Α

Table 7. Wacker Dr and JFK Rd Saturday Noon-1PM HCS Existing Conditions

The table provides a rundown of the existing conditions during Saturday from 12-1 pm at Wacker and JFK, displaying results across various movement groups. Notably, the absence of data in the EB right and WB through movement is explained by the apparent configuration at the top right of the table indicating synchronization between the through movement and the right movement of the EB direction, as for the WB the configuration combines the through movements with its respective turning lane consolidating data from both sections. Of particular significance for analysis are several key variables: Control Delay, Level of Service (LOS), Approach Delay alongside corresponding LOS, and the overall intersection delay and LOS. Examination of these variables reveals that the Wacker and JFK intersection operates at an average LOS of C, which falls within acceptable parameters. There is no indication of approaching an undesirable LOS of D or exceeding a delay threshold of 35 s/veh. In summary, the existing operational signaling demonstrates effective functionality, ensuring smooth traffic flow within acceptable parameters.

Table 8.Wacker Dr and JFK Rd Saturday Noon-1PM HCS Existing Conditions Optimized

		пс	July	nalize	a mite	rsecu	OII K	esu	113 3	uiii	ınaı y					
General Inform	ation								Inters	sect	ion Info	ormatic	nn	1 3	dool	K U
Agency	iution								Durat			1.000			4.1	
Analyst				Analys	ie Date	5/1/20	24		Area	_		Other		- 4		
Jurisdiction				Time F		5/1/20	24		PHF	туре		1.00				
Urban Street		JFK Rd			is Year	2024				oio I	Period	1> 7:0	20	- 6		•
Intersection		JFK/Wacker		File Na		_		F						-		
		JFK/Wacker		File Na	ime	vvacke	r_Penn	EXIS	sting U	paai	e 12-1	(Overal	прега	- 5	111	
Project Descrip	tion															
Demand Inform	nation				EB		$\overline{}$	٧	/B		$\overline{}$	NB		$\overline{}$	SB	
Approach Move	ment			L	Т	R	L	Т	Т	R	L	T	R	L	Т	R
Demand (v), v	eh/h			389	16	71	12		4	14	116	536	4	13	498	35
0:	41						1 11	-				-				
Signal Informa	74.4	Deference Dhace	2		1 6		24	L	· 뉰			Į		tz		,
Cycle, s		Reference Phase		-	15	1 517	"l ∩i	"F					1	2	3	
Offset, s	0	Reference Point	End	Green	1.9	4.5	24.0	17	7.8 4	1.6	0.0					5
Uncoordinated	Yes	Simult. Gap E/W	Off	Yellow		0.0	4.0	3.		3.0	0.0		$\setminus \triangleleft$	_	⋰ │	V
Force Mode	Fixed	Simult. Gap N/S	Off	Red	1.5	0.0	1.5	2.	5 2	2.5	0.0		6	0	7	
Timer Results				EBI	_	EBT	WBI		WBT	-	NBL	_	NBT	SBI		SBT
Assigned Phase	p			LDI		4	VVDI		8		5		2	1	-	6
Case Number						10.0			12.0		2.0	_	4.0	2.0		4.0
Phase Duration	. s				_	23.3		_	10.1	_	11.4		34.0	6.9	-	29.5
	nange Period, (Y+R c), s				_	5.5			5.5	_	5.0		5.5	5.0		5.5
	ax Allow Headway (MAH), s			_	_	3.3		_	3.2	-	3.1	_	3.0	3.1	_	3.2
	uax Allow Headway (MAH), s ueue Clearance Time (g s), s					16.8			2.6	\neg	6.8	-	9.8	2.6		21.8
Green Extensio					_	0.9		_	0.0	_	0.1	_	0.7	0.0		2.1
Phase Call Proi		(8-7)				1.00			0.46		0.91		1.00	0.26		1.00
Max Out Probal					-	0.00		_	0.00	\rightarrow	0.01	-	0.08	0.00	_	0.00
Movement Gro	up Res	ults			EB			W	В	_		NB			SB	
Approach Move	ment			L	T	R	L	Т	R	≀	L	T	R	L	Т	R
Assigned Move	ment			7	4	14	3	8	18	8	5	2	12	1	6	16
Adjusted Flow F	Rate (v), veh/h		117	359		16		14	4	116	270	270	15	524	45
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1767	1731		1788		15	76	1767	1856	1851	1767	1856	159
Queue Service	Time (g s), S		4.0	14.8		0.6		0.	6	4.8	7.8	7.8	0.6	19.8	19.
Cycle Queue C	learanc	e Time (gε), s		4.0	14.8		0.6		0.	6	4.8	7.8	7.8	0.6	19.8	19.
Green Ratio (g	/C)			0.24	0.24		0.06		0.0	06	0.09	0.38	0.38	0.03	0.32	0.3
Capacity (c), v	reh/h			424	415		112		99	9	151	713	711	44	600	51
Volume-to-Capa	acity Ra	tio (X)		0.275	0.865		0.141		0.1	44	0.766	0.379	0.380	0.335	0.873	0.8
Back of Queue	(Q), fl	l/ln (95 th percentile)	73	256		12		1	1	97	142	138	12	298	25
Back of Queue	(Q), ve	eh/ln (95 th percenti	le)	2.9	10.0		0.5		0.	4	3.8	5.5	5.5	0.5	11.7	10.
Queue Storage	Ratio (RQ) (95 th percent	tile)	0.15	0.51		0.27		0.2	25	0.19	0.28	0.28	0.02	0.60	0.5
Uniform Delay ((d1), s	/veh		23.0	27.2		33.0		33	.0	33.3	16.6	16.6	35.7	23.8	23.
Incremental De	lay (d 2), s/veh		0.1	2.2		0.2		0.	2	3.1	0.1	0.1	0.9	0.9	1.
Initial Queue De	elay (d	3), s/veh		0.0	0.0		0.0		0.	0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/ve	eh		23.2	29.4		33.3		33	.3	36.4	16.7	16.7	36.7	24.7	24.
Level of Service	(LOS)			С	С		С		C	;	D	В	В	D	С	С
Approach Delay	, s/veh	/LOS		27.9		С	33.3		С		20.2		С	25.0		С
Intersection Del	lay, s/ve	h / LOS				24	.3							С		
Multimodal Re					EB			W				NB			SB	
Pedestrian LOS				2.30	-	В	2.30	\rightarrow	В		1.90	-	В	2.10	-	В
	ore / LC			1.27		A	0.51		Δ		1.03		Α	1.20		Α

The table above presents the optimized results for the Wacker and JFK intersection during Saturday from 12-1 pm, expanding upon the previously analyzed existing conditions. Although marginal, improvements are observable, particularly in the total intersection delay, which has decreased by a modest 0.1 s/veh. On closer look, it is evident that while the control delay and approach delay have remained relatively stable across most movements, there has been a notable decrease in the EB direction. Particularly noteworthy is the reduction of 0.6 s/veh in the approach delay for all EB movements. This optimization strategy tactically addresses delay in each direction, aligning effectively with the traffic volume dynamics of the intersection. In essence, these optimizations contribute incrementally to enhancing traffic flow within the intersection, showcasing a focused approach to managing delay across diverse movement directions.

Synchro Analysis Methods:

The following Synchro simulation analysis was done using the SimTraffic features. The directions analyzed were found to have the most significant delay per vehicle (seconds) for the two major signalized intersections for the current conditions.

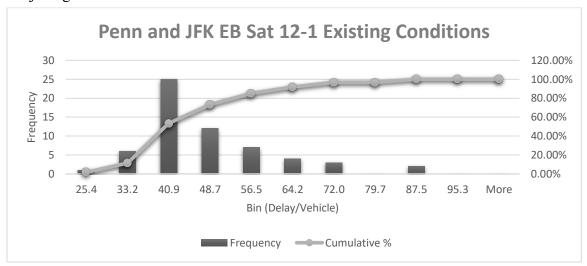


Figure 6. The total delay/vehicle the Penn and JFK intersection going eastbound experienced during the 60 simulation runs from 12-1 on a Saturday.

For each of the 60 simulation runs that were run on SimTraffic, our team obtained a total delay per vehicle. As shown on the graph above, on Saturday (February 10, 2024) at the Pennsylvania Ave and JFK intersection, the traffic going eastbound had approximately 70 percent of the simulation runs have a total delay per vehicle of 48.7 seconds or less. The eastbound direction at this intersection was significant since there were many collisions going out of the driveway about 205 feet from the stop bar of the leg as mentioned earlier. The minimum delay per vehicle for the EB direction was found to be 25.4 seconds while the maximum delay was found to be 87.5 seconds with an average delay of 44.3 seconds. With 95

percent confidence, one could say that the total delay per vehicle would fall between 41 and 47.5 seconds for the eastbound direction of Pennsylvania Ave and JFK.

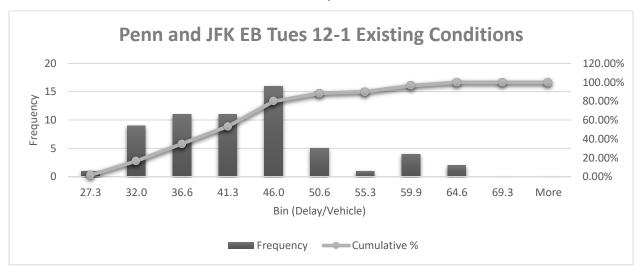


Figure 7. The total delay/vehicle the Penn and JFK intersection going eastbound experienced during the 60 simulation runs from 12-1 on a Tuesday.

For each of the 60 simulation runs off of SimTraffic, our team obtained a total delay per vehicle. As shown on the graph above, on Tuesday (February 6, 2024) at the Pennsylvania Ave and JFK intersection, the traffic going eastbound had approximately 70 percent of the simulation runs have a total delay per vehicle of 46 seconds or less. The minimum delay per vehicle for this direction was found to be 27.3 seconds while the maximum delay was found to be 64.6 seconds with an average delay of 40.6 seconds. With 95 percent confidence, one could say that the total delay per vehicle would fall between 38.3 seconds and 42.8 seconds for the eastbound direction of Pennsylvania Ave and JFK.

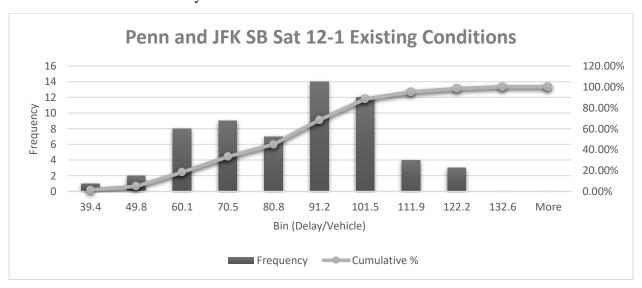


Figure 8. The total delay/vehicle the Penn and JFK intersection going southbound experienced during the 60 simulation runs from 12-1 on a Saturday.

Another direction that was found significant at this intersection was the southbound direction. This leg is significant because it had the largest total delay per vehicle. 60 simulation runs were done on SimTraffic for the southbound direction at Pennsylvania Ave and JFK. The team obtained a total delay per vehicle for each of the simulation runs as shown on the graph above. The Saturday (February 10, 2024) Pennsylvania Ave and JFK intersection results had vehicles going southbound having a delay of 91.2 seconds or less for 70 percent of the simulation runs. The minimum delay per vehicle for the SB direction was found to be 39.4 seconds while the maximum delay was found to be 122.2 seconds (with an average delay of 79.8 seconds). With 95 percent confidence, one could say that the total delay per vehicle would fall between 74.9 seconds and 84.8 seconds for the southbound direction of Pennsylvania Ave and JFK.

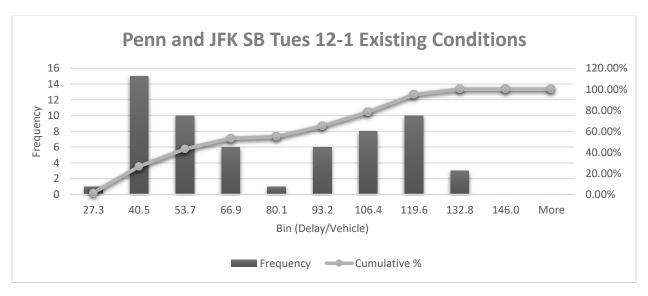


Figure 9. The total delay/vehicle the Penn and JFK intersection going southbound experienced during the 60 simulation runs from 12-1 on a Saturday.

Additionally, 60 simulation runs were done on SimTraffic for the southbound direction at Pennsylvania Ave and JFK for a Tuesday. For 70 percent of the simulation runs done on Tuesday (February 6, 2024) vehicles experienced a total delay of 106.4 seconds or less. The minimum delay per vehicle in the SB direction was found to be 27.3 seconds, while the maximum delay for this direction was 132.8 seconds (with an average delay of 71 seconds). With 95 percent confidence, one could say that the total delay per vehicle would fall between 62.5 seconds and 79.5 seconds for the southbound direction of Pennsylvania Ave and JFK.

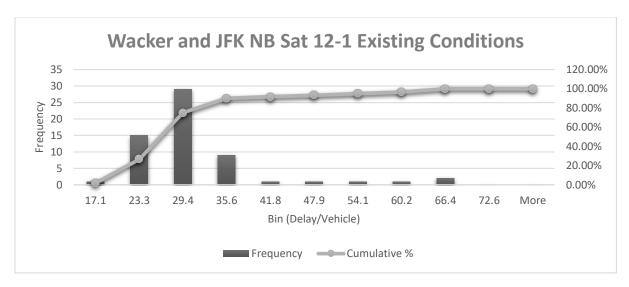


Figure 10. The total delay/vehicle the Wacker and JFK intersection going northbound experienced during the 60 simulation runs from 12-1 on a Saturday.

We also analyzed the total delay per vehicle for the Wacker Dr and JFK intersection. The team felt that the northbound direction was significant in this analysis. We believe this leg of the intersection to be significant because we wanted to analyze the total delay per vehicle at one of the JFK legs and this leg had the highest total delay per vehicle of the two. On Saturday (February 10, 2024) at the Wacker Dr and JFK intersection, northbound vehicles experienced a delay of 29.4 seconds or less for 70 percent of simulation runs. The minimum delay per vehicle for the NB direction was 17.1 seconds, while the maximum delay was 66.4 seconds (with an average delay of 28.4 seconds). With 95 percent confidence, one could say that the total delay per vehicle would fall between 25.9 seconds and 31 seconds for the northbound direction of Wacker Dr and JFK.

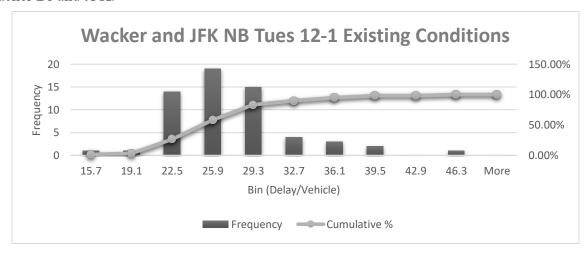


Figure 11. The total delay/vehicle the Wacker and JFK intersection going northbound experienced during the 60 simulation runs from 12-1 on a Tuesday.

The delay per vehicle was also analyzed at the intersection of Wacker Dr and JFK (for 24 vehicles traveling northbound) on Tuesday (February 6, 2024). Vehicles going northbound experienced a delay of 29.3 seconds or less for 70 percent of simulation runs. The minimum delay per vehicle for the NB direction was found to be 15.7 seconds while the maximum delay was 42.9 seconds (with an average delay of 25.7 seconds). With 95 percent confidence, one could say that the total delay per vehicle in the northbound direction at Wacker Dr and JFK would fall between 24.3 seconds and 27 seconds.

Wacker and JFK WB Sat 12-1 Existing Conditions

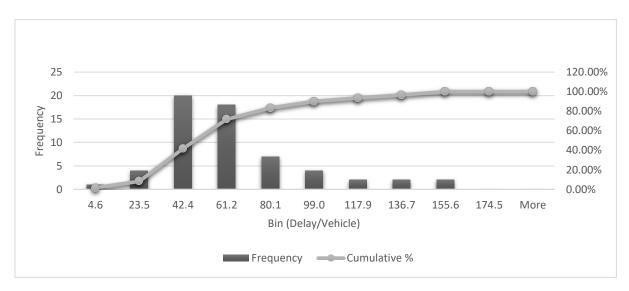


Figure 12. The total delay/vehicle the Wacker and JFK intersection going westbound experienced during the 60 simulation runs from 12-1 on a Saturday.

The delays experienced by a vehicle traveling westbound through Wacker and JFK was analyzed. The east leg of the intersection had the largest total delay per vehicle. On Saturday (February 10, 2024) the Wacker Dr and JFK intersection had westbound vehicles experiencing a delay of 61.2 seconds or less for 70 percent of simulation runs. The minimum delay per vehicle for the WB direction was 4 seconds, while the maximum delay was 155.6 seconds (with an average delay of 53.7 seconds). With 95 percent confidence, one could say that the total delay per vehicle would fall between 45.3 seconds and 62.1 seconds for the westbound direction of Wacker Dr and JFK.

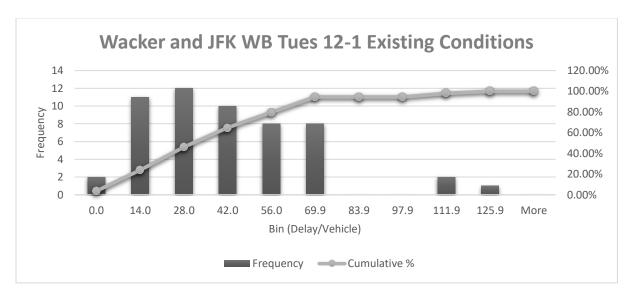


Figure 13. The total delay/vehicle the Wacker and JFK intersection going westbound experienced during the 60 simulation runs from 12-1 on a Tuesday.

Lastly, on Tuesday (February 6, 2024) westbound traffic at the Wacker Dr and JFK intersection, 70 percent of simulation runs resulted in a delay per vehicle of 42 seconds or less. The minimum delay per vehicle for the WB direction was 0 seconds, while the maximum delay was 111.9 seconds (with an average delay of 34.8 seconds). With 95 percent confidence, one could say that the total delay per vehicle would fall between 27.6 seconds and 42 seconds for the westbound direction of Wacker Dr and JFK.

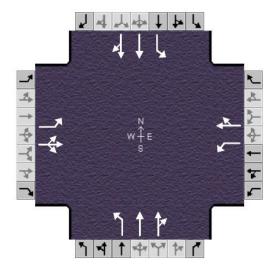


Figure 14. Existing intersection geometry of Wacker Dr and JFK Rd

Above is the existing intersection geometry of Wacker Dr and JFK. It is important to note that WB traffic is exiting a mall, while EB through would be entering the parking lot.

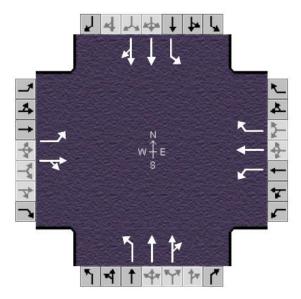


Figure 15. Existing intersection geometry of Pennsylvania Ave and JFK Rd

Shown above is the existing geometric layout of the Pennsylvania Ave and JFK intersection. It is important to note that vehicles driving towards the intersection do so at a significant decline, which contributes to the overall danger of the intersection (by increasing average vehicle speed).

HCS Two-Way Stop-Control Report **General Information** Site Information Payton Stuart Intersection Dubuque County University of Iowa Agency/Co. Jurisdiction East/West Street Date Performed 2/15/2024 Carter Rd 2024 Analysis Year North/South Street John F. Kennedy 3:05 0.92 Intersection Orientation North-South Analysis Time Period (hrs) 1.00 Project Description Lanes **Vehicle Volumes and Adjustments** Westbound Northbound Southbound U R U Priority 11 12 8 9 1U 3 2 Number of Lanes 0 Configuration Т TR LT Volume (veh/h) 29 8 572 96 37 551 Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) -7 Right Turn Channelized No Median Type I Storage Critical and Follow-up Headways Base Critical Headway (sec) 7.5 6.9 4.1 Critical Headway (sec) 5.42 6.22 4.12 Base Follow-Up Headway (sec) 3.5 3.3 2.2 Follow-Up Headway (sec) Delay, Queue Length, and Level of Service Flow Rate, v (veh/h) 32 40 Capacity, c (veh/h) 301 683 879 0.10 0.01 0.05 v/c Ratio 95% Queue Length, Q₉₅ (veh) 0.0 0.1 0.3 95% Queue Length, Q₉₅ (ft) 7.6 0.0 2.5 Control Delay (s/veh) 18.4 10.3 9.3 0.4 Level of Service (LOS) В Δ Δ Approach Delay (s/veh) 1.0 Approach LOS

Table 9. Carter Rd and JFK Rd Two-Way Stop HCS Control Report

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HCS™ TWSC Version 2024

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The analysis of the Carter and JFK intersection, as described above, presents the layout of the intersection alongside the vehicle volumes associated with the respective roadways, as determined by the Iowa DOT AADT maps. Additionally, a one-hour sample was conducted for all TWSC reports. The findings indicate a Level of Service (LOS) of A in the northbound and southbound directions, with an approach delay of 1 second per vehicle. However, in the westbound direction, the LOS is C with an approach delay of 16.6 seconds per vehicle. Overall, the intersection is in good standing, with potential opportunities for improvement in the westbound direction.

HCS Two-Way Stop-Control Report **General Information Site Information** Analyst Payton Stuart Intersection Crestwood/John F. Kennedy Agency/Co. U of I Jurisdiction Dubuque County Date Performed 2/20/2024 East/West Street Crestwood Analysis Year 2024 North/South Street John F. Kennedy Time Analyzed 10:37 Peak Hour Factor 0.92 Intersection Orientation North-South Analysis Time Period (hrs) 1.00 JFK Redesign Project Description Lanes **Vehicle Volumes and Adjustments** Westbound Northbound Southbound Movement 12 4U Priority 10 9 11 8 1U 1 2 3 5 6 0 0 R TR Configuration 2 3 4 411 411 4 Volume (veh/h) Percent Heavy Vehicles (%) 1 1 3 Proportion Time Blocked Percent Grade (%) Right Turn Channelized No Median Type | Storage Undivided Critical and Follow-up Headways Base Critical Headway (sec) 6.9 4.1 Critical Headway (sec) 7.22 7.12 4.16 3.3 2.2 Base Follow-Up Headway (sec) 3.5 Follow-Up Headway (sec) 3.31 2.23 Delay, Queue Length, and Level of Service Flow Rate, v (veh/h) Capacity, c (veh/h) 352 761 1099 v/c Ratio 0.01 0.00 0.00 95% Queue Length, Q₉₅ (veh) 0.0 0.0 0.0 0.0 0.0 0.0 95% Queue Length, Qss (ft) Control Delay (s/veh) 15.3 9.7 8.3 Α Α Level of Service (LOS) С Approach Delay (s/veh) 12.0 Approach LOS Copyright © 2024 University of Florida. All Rights Reserved. HCS TM TWSC Version 2024 Generated: 4/4/2024 7:11:52 PM

Table 10. Crestwood Dr and JFK Rd Two-Way Stop HCS Control Report

The analysis of the Crestwood and JFK intersection, as detailed above, reveals its layout and the traffic volumes observed on the respective roads, as determined by the Iowa DOT AADT maps. The report indicates that the intersection achieves a Level of Service (LOS) rating of A in the northbound and southbound directions, with an approach delay of 0.1 seconds per vehicle. In the eastbound direction, the intersection has a LOS of B with an approach delay of 12 seconds per vehicle. Based on these findings, it is concluded that the intersection does not require any operational or geometric modifications.

HCS Two-Way Stop-Control Report General Information Site Information Intersection Stoneman/John F. Kennedy Agency/Co. U of I Jurisdiction **Dubuque County** Date Performed 2/20/2024 East/West Street Stoneman 2024 John F. Kennedy Analysis Year Time Analyzed 10:34 Peak Hour Factor 0.92 Intersection Orientation North-South Analysis Time Period (hrs) 1.00 Project Description JFK Redesign Lanes 14174776 **Vehicle Volumes and Adjustments** Movement U R Priority 10 11 12 8 9 10 2 3 4U 4 5 6 Number of Lanes 0 0 0 0 1 1 1 0 0 0 2 1 2 Configuration 19 249 247 3 3 3 3 Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized No Critical and Follow-up Headways Base Critical Headway (sec) 7.5 6.9 4.1 4.1 Critical Headway (sec) 7.76 7.06 4.16 4.16 Base Follow-Up Headway (sec) 2.2 2.2 3.33 2.23 2.23 Follow-Up Headway (sec) 3.53 Delay, Queue Length, and Level of Service Flow Rate, v (veh/h)

Table 11. Stoneman Rd and JFK Rd Two-Way Stop HCS Control Report

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471

0.00

0.0

0.0

12.7

0.00

0.0

0.0

9.1

Capacity, c (veh/h)

95% Queue Length, Qas (veh)

95% Queue Length, Qss (ft)

Control Delay (s/veh)

Level of Service (LOS)

Approach Delay (s/veh)

Approach LOS

v/c Ratio

HCS™ TWSC Version 2024 Stoneman Stop Intersection.xtw 1278

0.02

0.0

0.0

7.9

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1273

0.00

0.0

7.8

The examination of the Stoneman and JFK intersection, as outlined above, showcases its layout and the traffic volumes observed on the respective roads, as determined by the Iowa DOT AADT maps. The analysis reveals a Level of Service (LOS) rating of A in the northbound and southbound directions, with an approach delay of 0.5 seconds per vehicle. In the eastbound direction, the intersection achieves an LOS of A with an approach delay of 10 seconds per vehicle. In summary, it is determined that this intersection does not require any operational or geometric alterations.

HCS Two-Way Stop-Control Report **General Information Site Information** Payton Stuart Daykin/John F. Kennedy Analyst Intersection U of I Jurisdiction Dubuque County 2/20/2024 Daykin 2024 North/South Street John F. Kennedy Analysis Year Time Analyzed 10:31 Peak Hour Factor 0.92 Intersection Orientation North-South Analysis Time Period (hrs) 0.25 Project Description JFK Redesign 14174716 **Vehicle Volumes and Adjustments** Approach Westbound Northbound Southbound Movement Priority 10 11 12 8 9 10 2 3 4U 4 5 6 Number of Lanes 0 0 0 0 0 0 0 0 2 1 1 2 1 1 Т Т TR TR Configuration 1 Volume (veh/h) 4 35 0 181 565 13 0 19 534 13 Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Undivided Median Type | Storage Critical and Follow-up Headways Base Critical Headway (sec) 6.9 Critical Headway (sec) 7.76 7.06 4.16 4.16 Base Follow-Up Headway (sec) 3.5 3.3 2.2 Follow-Up Headway (sec) 3.33 2.23 2.23 Delay, Queue Length, and Level of Service Flow Rate, v (veh/h) 38 197 21 Capacity, c (veh/h) 673 943 0.05 0.06 0.20 0.02 v/c Ratio 0.2 0.8 0.1 95% Queue Length, Q₉₅ (veh) 0.2 95% Queue Length, Q₉₅ (ft) 5.1 5.1 20.5 2.6 Control Delay (s/veh) 10.7 52.5 9.6 8.9 Level of Service (LOS) F Α Α Approach Delay (s/veh) Approach LOS Copyright © 2024 University of Florida, All Rights Reserved. HCS™ TWSC Version 2024 Daykin Stop Intersection.xtw

Table 12. Daykin Ct and JFK Rd Two-Way Stop HCS Control Report

The examination of the Daykin and JFK intersection, as detailed above, presents the intersection's layout and the vehicle volumes related to the respective roadways, utilizing data from the Iowa DOT AADT maps. The report indicates a Level of Service (LOS) of A in the northbound and southbound directions, with an approach delay of 2.3 seconds per vehicle in the northbound direction and 0.3 seconds per vehicle in the southbound direction. In the eastbound direction, the intersection achieves a LOS of B with an approach delay of 15 seconds per vehicle. Overall, it is concluded that no operational or geometric changes are necessary for this intersection.

HCS Two-Way Stop-Control Report General Information Site Information Analyst Payton Stuart Intersection University/John F. Kennedy Jurisdiction Agency/Co. Dubuque County Date Performed 2/20/2024 East/West Street University Analysis Year 2024 North/South Street John F. Kennedy 9:47 0.92 Analysis Time Period (hrs) Intersection Orientation North-South 0.25 Project Description JFK Redesign Lanes Vehicle Volumes and Adjustments Approach Movement U U Priority 10 11 12 8 9 1U 1 2 3 4U 4 5 6 Number of Lanes 0 0 0 0 0 0 0 0 0 2 0 1 2 Configuration R TR Volume (veh/h) 91 247 20 21 277 Percent Heavy Vehicles (%) Proportion Time Blocked Percent Grade (%) Right Turn Channelized Median Type | Storage Critical and Follow-up Headways Base Critical Headway (sec) 6.9 4.1 Critical Headway (sec) 7.26 4.16 Base Follow-Up Headway (sec) 3.3 2.2 3.33 Follow-Up Headway (sec) Delay, Queue Length, and Level of Service Flow Rate, v (veh/h) 99 23 Capacity, c (veh/h) 862 1261 v/c Ratio 0.11 0.02 95% Queue Length, Q₉₅ (veh) 0.4 0.1 95% Queue Length, Q₉₅ (ft) 10.2 2.6 Control Delay (s/veh) 9.7 7.9 Α Level of Service (LOS) Α Approach Delay (s/veh) 9.7 0.6 Approach LOS HCS™ TWSC Version 2024 University Stop Intersection.xtw Copyright © 2024 University of Florida, All Rights Reserved. Generated: 4/4/2024 7:10:21 PM

Table 13. University Ave and JFK Rd Two-Way Stop HCS Control Report

The assessment of the University and JFK intersection provided above outlines the intersection's layout and the traffic volumes associated with the respective roadways, sourced from the Iowa DOT AADT maps. According to the report, the intersection achieves a Level of Service (LOS) rating of A in the northbound and southbound directions, with an approach delay of 0.6 seconds per vehicle. In the eastbound direction, the intersection also attains an LOS of A with an approach delay of 9.7 seconds per vehicle. Overall, it is determined that there is no requirement for operational or geometric changes at this intersection.

HCS Signalized Intersection Results Summary General Information Intersection Information Duration, h Agency Analysis Date 2/15/2024 Analyst Area Type Other Jurisdiction Time Period PHF 1.00 Urban Street John F Kennedy Analysis Year 2024 Analysis Period 1> 12:00 12-1pm Penn/JFK TUESDAY Intersection (Penn-JFK)_5YEARprojec Intersection Project Description **Demand Information** WB Approach Movement 133 682 95 Demand (v), veh/h 174 207 110 172 94 102 591 183 Signal Information Cycle, s 67.3 Reference Phase Offset, s 0 Reference Point End Uncoordinated Yes Simult. Gap E/W On Force Mode Fixed Simult, Gap N/S On Red 1.2 0.0 Timer Results EBL EBT WBL WBT NBL NBT SBL SBT Assigned Phase 1.1 4.0 Case Number 4.0 1.1 3.0 4.0 1.1 Phase Duration, s 12.3 20.0 10.8 18.4 11.9 25.6 11.0 24.7 Change Period, (Y+Rc), s 52 5.2 52 52 52 5.1 5.2 5.1 Max Allow Headway (MAH), s 31 31 3 1 31 31 3 1 3 1 Queue Clearance Time (g s), s 7.1 13.7 4.4 7.5 6.0 18.5 4.3 14.0 Green Extension Time (g e), s 0.3 0.1 0.3 1.9 0.1 0.0 Phase Call Probability 0.96 0.79 0.95 1.00 0.83 1.00 1.00 1.00 0.00 Max Out Probability 0.00 0.00 0.00 0.00 0.09 0.00 1.00 Movement Group Results Ŧ R R Approach Movement L Assigned Movement 3 8 18 4 14 6 16 5 12 1 Adjusted Flow Rate (v), veh/h 174 317 84 172 94 162 483 462 94 372 343 Adjusted Saturation Flow Rate (s), veh/h/ln 1767 1746 1767 1856 1572 1838 1856 1776 1838 1856 1704 Queue Service Time (g s), s 5.1 11.7 2.4 5.5 3.4 4.0 16.5 16.5 2.3 12.0 12.0 Cycle Queue Clearance Time (g c), s 5.1 11.7 2.4 5.5 3.4 4.0 16.5 16.5 12.0 12.0 Green Ratio (g/C) 0.30 0.22 0.28 0.20 0.20 0.39 0.30 0.30 0.38 0.29 0.29 271 365 375 541 Capacity (c), veh/h 433 384 309 564 540 284 497 0.402 0.825 0.309 0.471 0.304 Volume-to-Capacity Ratio (X) 0.431 | 0.855 | 0.855 0.332 0.687 0.691 Back of Queue (Q), ft/ln (95 th percentile) 89 210 43 106 56 68 254 239 40 206 Back of Queue (Q), veh/ln (95 th percentile) 3.5 8.2 1.7 4.1 2.2 2.7 9.9 9.6 8.1 Queue Storage Ratio (RQ) (95 th percentile) 0.49 0.00 0.37 0.00 0.48 0.68 0.00 0.00 0.33 0.00 0.00 24.0 Uniform Delay (d 1), s/veh 18.5 25.1 19.6 23.1 15.1 22.1 22.1 21.2 21.2 16.4 Incremental Delay (d 2), s/veh 0.2 0.4 0.2 1.3 0.2 1.8 0.2 1.2 0.2 2.1 2.4 Initial Queue Delay (d 3), s/veh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 Control Delay (d), s/veh 18.7 26.8 19.8 24.3 23.4 15.3 23.3 23.3 16.6 23.3 23.6 В Level of Service (LOS) С С Approach Delay, s/veh / LOS 23.0 22.6 Intersection Delay, s/yeh / LOS 22.7 Multimodal Results WB EB NB SB 2.28 2.10 Pedestrian LOS Score / LOS В 2.28 В В 1.91 В Bicycle LOS Score / LOS 1.30

Table 14. Pennsylvania Ave and JFK Rd Tuesday Noon-1PM HCS 5 Year Projection Conditions

Table 14 presents the 5-year projections for the Pennsylvania Ave and JFK Rd intersection. A 1% population growth rate was applied to estimate future traffic volumes. The projected delays are slightly higher than those of the existing conditions. That being said, the intersection still maintains an acceptable level of service in all directions.

General Inform	ation							\neg	Intersec	tion Inf	ormatio	n	T &	4744	KIU
Agency									Duration,	, h	1.000			411	
Analyst				Analys	is Date	2/15/2	024	\neg	Area Typ	e	Other		4		
Jurisdiction				Time F	Period				PHF		1.00		3 ='		
Urban Street		John F Kennedy		Analys	is Year	2024			Analysis	Period	1> 12	-00	7		
Intersection		12-1pm Penn/JFK		File Na			DAY Int		ion (Peni				-		
Project Descrip	tion	TE Ipini Similari		1 110 111		1.020	D7 11 1111	0,000		10110_	,512,41	projeciii	-	1107	kiń
Demand Inform	nation				EB		7	WE	2		NB			SB	
Approach Move				L	T	R	1	ΤŢ	R	1	T	R	1	T	R
Demand (v), v				174	207	110	84	172		133	682	95	102	591	18
Demand (V), V	GIVII		-	174	201	110	04	177	. 34	133	002	33	102	331	10
Signal Informa	tion				T L	$\overline{}$		$\overline{}$	$\overline{}$	$\overline{}$	R.				人
Cycle, s	70.9	Reference Phase	2	1	"		1214	"F	4	R	į •	\ 4)	→	7
Offset, s	68	Reference Point	End		100	500						1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Green Yellow		0.8	22.1 4.0	5.7 4.0	1.9	13.7	-l		-4-	_	_
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		M 6	Y	7	↔
. Sico Mode	, iven	Simult. Oap 14/5	Jii	rtou	1.6	10.0	11.1	1.2	10.0	1.2					
Timer Results				EBI	-	EBT	WB	L	WBT	NBI	L	NBT	SBI	-	SBT
Assigned Phase	9			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	, S			12.8	3 3	20.8	10.9)	18.9	12.0)	28.0	11.2	2	27.2
Change Period,	hange Period, (Y+R c), s					5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Head	lax Allow Headway (MAH), s					3.1	3.1		3.1	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	(g s), S		7.4		14.3	4.6		7.9	6.1		19.0	4.3		14.4
Green Extensio	n Time	(ge), S		0.3	\neg	1.1	0.2		1.1	0.3		3.6	0.2		3.4
Phase Call Prol	bability			0.97	,	1.00	0.81		1.00	0.96	5	1.00	0.85	5	1.00
Max Out Probal	bility			0.00) (0.00	0.00		0.00	0.00)	0.00	0.00		0.08
Movement Gro	un Res	ulte			EB			WB			NB			SB	
Approach Move		ruito		L	T	R	L	T	R	1	T	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow F) veh/h		174	317	10	84	172	94	162	483	462	94	372	34
		ow Rate (s), veh/h/l	n	1767	1746		1767	1856		1838	1856	1776	1838	1856	170
Queue Service				5.4	12.3		26	5.9	3.7	4 1	17.0	17.0	2.3	12.3	12
Cycle Queue C				5.4	12.3		2.6	5.9	3.7	4.1	17.0	17.0	2.3	12.3	12.
Green Ratio (a		e rane (gr), s		0.30	0.22		0.28	0.19		0.41	0.32	0.32	0.40	0.31	0.3
Capacity (c), v				430	387		267	361	306	384	601	575	292	581	53
Volume-to-Capa		rtin (X)		0.405	0.818		0.315			0.421	0.803	0.803	0.322	0.639	0.64
		t/In (95 th percentile	0	97	220		47	114	60	71	262	247	41	204	18
	4 - 11	eh/In (95 th percenti	,	3.8	8.6		1.8	4.5	2.3	2.8	10.2	9.9	1.6	8.0	7.5
		RQ) (95 th percent		0.53	0.00		0.41	0.00		0.71	0.00	0.00	0.34	0.00	0.0
Uniform Delay (iiie)	19.6	26.5		20.9	25.6		15.1	22.1	22.1	16.4	21.1	21.
				0.2	1.7		0.2	0.4	0.2	0.2	0.6	0.6	0.2	0.3	0.3
	cremental Delay (d 2), s/veh itial Queue Delay (d 3), s/veh			0.2	0.0		0.2	0.4	0.2	0.2	0.0	0.0	0.2	0.0	0.
Control Delay (••		19.8	28.1		21.1	26.0		15.2	22.7	22.7	16.6	21.4	21.
Level of Service				19.6 B	20.1		21.1 C	20.0 C	24.9 C	15.2 B	C C	C C	10.0 B	21.4 C	21. C
	, ,			25.2		С	24.5			21.6		C	20.9		
Approach Delay				25.2		_	24.5)	С	21.6)	_	20.9 C	,	С
microection De	ntersection Delay, s/veh / LOS					24									
Multimodal Re	sults				EB			WB			NB			SB	
Pedestrian LOS	Score	/LOS		2.28	3	В	2.28	3	В	2.10		В	1.91		В
	cycle LOS Score / LOS					Α	1.07	-	Α		1	Α	1.21	-	Α

Table 15. Pennsylvania Ave and JFK Rd Tuesday Noon-1PM HCS 5 Year Projection Conditions Optimized

Analysis of the projected traffic conditions in 5 years at the Pennsylvania Ave and JFK intersection on Tuesday from Noon-1PM are shown above. The projection conditions were optimized to minimize overall delay and successfully did so in the NB/SB directions (with minimal increases in the EB/WB directions). Before and after optimization the intersection maintained an acceptable level of service, going from an average delay of 22.7 seconds/vehicle to 22.4 seconds/vehicle after optimization (both delays falling into the LOS C range). The intersection sees a level of service of B for all left turns (excluding that of the left-hand turn from Wacker Dr onto JFK which receives a C), and C for all through movements.

HCS Signalized Intersection Results Summary General Information Intersection Information 1.000 Agency Duration h Analyst Analysis Date 2/15/2024 Area Type Time Period Jurisdiction PHF 1.00 Analysis Year 2024 Urban Street John F Kennedy Analysis Period 1> 12:00 Intersection 12-1pm Penn/JFK File Name TUESDAY Intersection (Penn-JEK) 10YEARproje Project Description **Demand Information** EB Approach Movement т R R L т Demand (v), veh/h 183 218 116 88 181 98 140 717 99 107 621 192 Signal Information Reference Phase Offset, s Reference Point 0 End 14.2 Green 6.0 Uncoordinated Simult. Gap E/W On Yes Yellow 4.0 Red 1.2 Force Mode Fixed Simult. Gap N/S On Timer Results **EBL** EBT WBL WBT NBL NBT SBL SBT Assigned Phase 8 6 3.0 4.0 Case Number 1.1 4.0 1.1 1.1 Phase Duration, s 21.4 11.0 19.4 12.0 27.5 26.7 13.0 11.2 Change Period, (Y+Rc), s 5.2 5.2 5.2 5.2 5.2 5.2 5.1 3.1 3.1 3.1 3.1 Max Allow Headway (MAH), s 3.1 3.1 3.1 3.1 Queue Clearance Time (gs), s 15.0 4.7 20.3 15.3 0.3 0.1 1.2 0.3 2.0 0.1 Green Extension Time (g e), s 1.1 0.0 0.97 Phase Call Probability 1.00 0.82 1.00 0.97 1.00 0.86 1.00 Max Out Probability 0.00 0.00 0.00 0.00 0.00 0.15 0.00 1.00 **Movement Group Results** FB NB R R R Approach Movement т R Assigned Movement 3 8 18 4 14 6 16 5 2 12 183 334 88 181 98 170 486 360 Adjusted Flow Rate (v), veh/h 507 99 391 Adjusted Saturation Flow Rate (s), veh/h/ln 1767 1746 1767 1856 1572 1838 1856 1776 1838 1856 1705 Queue Service Time (g s), s 13.0 6.2 3.8 18.3 13.2 13.3 Cycle Queue Clearance Time (g c), s 5.7 13.0 2.7 6.2 3.8 44 18.3 18.3 2.5 13.2 13.3 Green Ratio (g/C) 0.31 0.23 0.28 0.20 0.20 0.40 0.31 0.31 0.39 0.30 0.30 Capacity (c), veh/h 430 398 263 371 315 363 585 560 274 565 519 Volume-to-Capacity Ratio (X) 0.425 0.839 0.334 0.487 0.311 0.469 0.868 0.868 0.361 0.691 0.694 Back of Queue (Q), ft/ln (95 th percentile) 100 230 48 119 62 76 284 268 44 224 206 Back of Queue (Q), veh/ln (95 th percentile) 3.9 9.0 1.9 4.7 2.4 3.0 11.1 10.7 1.7 8.8 8.2 Queue Storage Ratio (RQ) (95 th percentile) 0.55 0.00 0.42 0.00 0.54 0.76 0.00 0.00 0.36 0.00 0.00 Uniform Delay (d 1), s/veh 19.2 26.2 20.6 25.2 24.3 15.7 23.0 23.0 17.1 21.8 21.8 Incremental Delay (d 2), s/veh 0.2 1.9 0.3 0.4 0.2 0.2 2.4 2.5 0.2 2.1 2.3 Initial Queue Delay (d 3), s/veh 0.0 0.0 0.0 0.0 0.0 0.0 Control Delay (d), s/veh 19.5 28.1 20.9 25.6 24.5 15.9 25.4 25.5 17.3 23.8 24.1 Level of Service (LOS) С С С С С В С С Approach Delay, s/veh / LOS 242 24 0 23.2 C C Intersection Delay, s/veh / LOS Multimodal Results ΕB WB NB SB Pedestrian LOS Score / LOS 2.28 2.28 2.10 1.91 1.34 Bicycle LOS Score / LOS 1.09

Table 16. Pennsylvania Ave and JFK Rd Tuesday Noon-1PM HCS 10 Year Projection Conditions

Table 16 presents the 10-year projections for the Pennsylvania Ave and JFK Rd intersection. The 1% population growth rate was applied to estimate future traffic volumes. The projected delays continue to increase further into the future the projection goes. Ten years into the future, the intersection still maintains an acceptable level of service in all directions.

	_	HCS	Sigr	nalize	d Inte	rsect	ion R	esul	ts Sun	ımary		_	_	_	
General Inform	ation							I	Intersec	tion Inf	ormatic	on	الم ا	dool	NIU.
Agency	idiloli							\rightarrow	Duration.		1.000			4.4	
Analyst				Analys	ie Date	2/15/2	0024	\rightarrow	Area Typ		Other		4		
Jurisdiction				Time F		211312	.024		PHF	C	1.00		4		
Urban Street		John F Kennedy			sis Year	2024		_	Analysis	Darind	1> 12	-00	- 3		
Intersection		12-1pm Penn/JFK		File N			DAV In	_	ion (Peni				- 100		
Project Descrip	tion	12-1pm Penn/JFK		File IV	ame	TUES	DAT IIII	ersect	ion (Peni	1-JFK)_	IUTEA	кргоје	-	4 - 44	P A
Demand Inform					EB		-	WE		-	NB		-	SB	_
Approach Move				L	T	R	<u>_</u>	T	R	L	T	R	L	T	F
Demand (v), v	eh/h		_	183	218	116	88	18	1 98	140	717	99	107	621	19
Signal Informa	tion				T U.		IJ.				R.				5
Cycle, s	74.9	Reference Phase	2	1	1 ,			<u> </u>	4	2	₽ ·		<u> </u>	⋰ │	7
Offset, s	116	Reference Point	End		1	1.1	7 51		- 12	79		1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Green		0.7	24.3	5.9	2.1	15.0	<u> </u>		-+-	_	_
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	1.2	0.0	1.1	1.2	0.0	1.2		6	Y	7	-€
Timer Results				EBI	_	EBT	WB	L	WBT	NB	L	NBT	SBI	_	SBT
Assigned Phase	9			3	_	8	7	\rightarrow	4	1	\rightarrow	6	5	\rightarrow	2
Case Number				1.1	\perp	4.0	1.1	\perp	3.0	1.1		4.0	1.1		4.0
Phase Duration	•					22.3	11.1	_	20.2	12.0	_	30.1	11.3	3	29.4
Change Period,	hange Period, (Y+R c), s					5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Head	ax Allow Headway (MAH), s					3.1	3.1		3.1	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	(gs), s		8.0		15.7	4.8		8.5	6.5		20.9	4.5		15.6
Green Extensio		(ge),s		0.1		1.2	0.1	_	1.2	0.3	_	3.9	0.2		3.9
Phase Call Prol	bability			0.98	3	1.00	0.84	4	1.00	0.97	7	1.00	0.87	7	1.00
Max Out Probal	bility			1.00		0.00	0.00		0.00	0.00		0.00	0.00		0.00
Movement Gro	up Res	sults			EB			WB			NB			SB	
Approach Move	•			L	T	R	1	T	R	L	T	R	L	T	T R
Assigned Move	ment			3	8	18	7	4	14	1	6	16	5	2	13
Adjusted Flow F) veh/h		183	334		88	181	98	170	507	486	99	391	36
		ow Rate (s), veh/h/l	n	1767	1746		1767	1856		1838	1856	1776	1838	1856	170
Queue Service			-	6.0	13.7		2.8	6.5	4.0	4.5	18.9	18.9	2.5	13.6	13
Cycle Queue C				6.0	13.7		2.8	6.5	4.0	4.5	18.9	18.9	2.5	13.6	13
Green Ratio (g		(80),0		0.31	0.23		0.28	0.20	0.20	0.42	0.33	0.33	0.41	0.32	0.3
Capacity (c), v				426	401		258	373	316	371	621	595	281	604	55
Volume-to-Capa		itio (X)		0.430	0.833		0.341	0.485		0.460	0.816	0.816	0.352	0.647	0.6
		t/In (95 th percentile)	108	242		52	128	66	80	288	271	45	221	20
		eh/ln (95 th percenti		4.2	9.5		2.0	5.0	2.6	3.1	11.2	10.8	1.8	8.6	8.
		RQ) (95 th percent	_	0.59	0.00		0.45	0.00	0.58	0.79	0.00	0.00	0.38	0.00	0.0
Uniform Delay (20.4	27.7		21.9	26.7	25.7	15.7	23.0	23.0	17.2	21.7	21
Incremental De				0.3	1.8		0.3	0.4	0.2	0.2	0.6	0.7	0.2	0.3	0.
Initial Queue De				0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Control Delay (d), s/ve	eh		20.7	29.5		22.2	27.0	25.9	15.9	23.6	23.6	17.4	22.0	22
Level of Service	(LOS)			С	С		С	С	С	В	С	С	В	С	C
Approach Delay	, s/veh	/LOS		26.3	3	С	25.6	6	С	22.5	5	С	21.5	5	С
Intersection Del	ay, s/ve	h / LOS				23	3.3						С		
Marking	14							1			1				
Multimodal Re				2.5	EB	_	2.5	WB		2.00	NB	_		SB	_
Pedestrian LOS				2.28	_	В	2.28	_	В	2.10	_	В	1.91	_	В
	ycle LOS Score / LOS					Α	1.09	9	Α	1.28	3	A	1.25	5	Α

Table 17. Pennsylvania Ave and JFK Rd Tuesday Noon-1PM HCS 10 Year Projection Conditions Optimized

Analysis of the projected traffic conditions in 10 years at the Pennsylvania Ave and JFK intersection on Tuesday from Noon-1PM are shown above. Conditions were optimized to minimize overall delay and did so in the NB/SB directions (with minimal increases in the EB/WB directions). The intersection maintained an acceptable level of service, going from an average delay of 24 seconds/vehicle to 23.3 seconds/vehicle after optimization (both delays receiving an acceptable level of service of C). The intersection sees a level of service of B for both the NB and SB left turns, a C for the EB and WB left turns, and C for all through movements.

HCS Signalized Intersection Results Summary General Information Intersection Information Agency Duration, h 1.000 Analyst Analysis Date 2/15/2024 Area Type Other Jurisdiction Time Period PHF 1.00 Urban Street John F Kennedy Analysis Year 2024 Analysis Period 1> 12:00 Intersection 12-1pm Penn/JFK File Name TUESDAY Intersection (Penn-JFK)_20YEARproje Project Description EB **Demand Information** WB NB SB Approach Movement т R т R т т R т Demand (v), veh/h 203 240 128 98 200 109 155 792 110 118 685 212 Signal Information ٨. Cycle, s 79.3 Reference Phase Offset, s 0 Reference Point 16.3 Green 6.4 25.6 3.0 Uncoordinated Yes Simult. Gap E/W On Yellow 4.0 Force Mode Fixed Simult. Gap N/S 0.0 **Timer Results EBL EBT** WBL WBT NBL NBT SBL SBT Assigned Phase 8 4.0 3.0 4.0 1.1 4.0 Case Number 1.1 1.1 1.1 Phase Duration, s 14 4 24.5 11.4 21.5 12.7 31.8 11.6 30.7 Change Period, (Y+Rc), s 5.2 5.2 5.2 5.2 5.2 5.1 5.2 5.1 Max Allow Headway (MAH), s 3.1 3.1 3.1 3.1 3.1 3.1 3 1 3.1 Queue Clearance Time (gs), s 9.0 18.0 5.3 9.6 7.3 24.7 5.0 18.4 Green Extension Time (ge), s 0.3 1.2 0.1 1.3 0.3 1.9 0.1 0.0 Phase Call Probability 0.99 1.00 0.88 1.00 0.98 1.00 0.91 1.00 Max Out Probability 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.40 Movement Group Results EΒ WB NB SB Approach Movement R R т R Assigned Movement 18 7 14 16 2 12 3 8 4 1 6 5 Adjusted Flow Rate (v), veh/h 203 368 98 200 109 188 559 536 109 432 398 Adjusted Saturation Flow Rate (s), veh/h/ln 1767 1746 1767 1856 1572 1838 1856 1776 1838 1856 Queue Service Time (g s), s7.0 16.0 3.3 7.6 47 5.3 22.7 22.7 3.0 16.3 16 4 Cycle Queue Clearance Time (gc), s 3.3 7.0 16.0 7.6 4.7 5.3 22.7 22.7 3.0 16.3 16.4 0.24 0.21 0.21 0.42 0.34 0.34 0.32 0.32 Green Ratio (g/C) 0.32 0.28 0.40 Capacity (c), veh/h 425 426 246 382 324 344 626 599 252 599 550 0.864 0.723 Volume-to-Capacity Ratio (X) 0.478 0.399 0.523 0.337 0.547 0.894 0.895 0.433 0.722 Back of Queue (Q), ft/In (95 th percentile) 127 278 62 151 78 95 357 337 54 267 244 Back of Queue (Q), veh/ln (95 th percentile) 4.9 10.8 2.4 3.7 13.9 13.5 2.1 9.8 5.9 3.1 10.4 Queue Storage Ratio (RQ) (95 th percentile) 0.70 0.00 0.54 0.00 0.68 0.95 0.00 0.00 0.45 0.00 0.00 Uniform Delay (d 1), s/veh 21.1 28.8 23.1 28.1 26.9 17.3 25.0 25.0 19.1 23.8 2.5 Incremental Delay (d 2), s/veh 0.3 0.4 0.4 0.2 0.3 5.5 5.8 0.3 23 2.5 Initial Queue Delay (d 3), s/veh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 Control Delay (d), s/veh 31.3 23.5 28.5 30.5 30.8 19.3 26.1 26.3 21.4 27.1 17.6 Level of Service (LOS) C C C С С В С C В C C Approach Delay, s/veh / LOS 26.9 С 28.7 С 25.4 C Intersection Delay, s/veh / LOS 27.3 C Multimodal Results Pedestrian LOS Score / LOS 2.28 2.29 2.10 1.91 В В В Bicycle LOS Score / LOS 1.43

Table 18. Pennsylvania Ave and JFK Rd Tuesday Noon-1PM HCS 20 Year Projection Conditions

Table 18 presents the 20-year projections for the Pennsylvania Ave and JFK Rd intersection. The projected delays continue to increase further into the future. Twenty years into the future, the intersection still maintains an acceptable level of service in all directions (although it is steadily approaching the unacceptable LOS of 35 second/vehicle delay).

		поз	Sigr	ianze	u mite	13000	ion K	esui	Juli	iiiiaiy					
General Inform	nation								Intersec	tion Inf	ormatio	on	1 2	doet	NU
Agency									Duration.	h	1.000			4.6	
Analyst				Analys	is Date	2/15/2	024	\rightarrow	Area Typ		Other		4		
Jurisdiction				Time F		2.10/2		-	PHF		1.00		2		:
Urban Street		John F Kennedy		Analys	is Year	2024			Analysis	Period	1> 12	-00	- 3		
Intersection		12-1pm Penn/JFK		File N		-	DAY Int	_	ion (Penr				-		
Project Descrip	tion	TZ-TPITT CHINGT K		T IIC IV		11020	DAI III	010001	on (r om	1-01 It/ <u></u>	ZUTEA	тргојо		111	N A
Demand Inform	nation				EB			WE	}		NB			SB	
Approach Move				L	T	R	1	T	R	1	ΤT	R	1	ΤT	T R
Demand (v), v				203	240	128	98	200		155	792	110	118	685	21
Demand (V), V	en/n			203	240	120	90	200	109	100	792	110	110	000	21.
Signal Informa	tion				T U	$\overline{}$	IJ.	$\overline{}$		$\overline{}$	8				K
Cycle, s	83.8	Reference Phase	2	1	" ₂₁			. L	4	R	£ .	\ K	<u> </u>		+
Offset, s	56	Reference Point	End		1	1	" [1		_ S			1	2	3	
Uncoordinated	Yes	Simult, Gap E/W	On	Green		0.9	29.2	6.3 4.0	3.5	16.6	<u> </u>		-4-		_
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	1.2	0.0	4.0	1.2	0.0	1.2		Y 6	Y	7	↔
1 orce would	1 IXEG	Simult. Gap 19/5	Oll	. tou	1.2	10.0	11.1	1.2	0.0	1.2		9			
Timer Results				EBI		EBT	WB	L	WBT	NBI		NBT	SBI	L	SBT
Assigned Phase	е			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	, s			15.0		25.3	11.5	,	21.8	12.6	,	35.2	11.7		34.3
Change Period,	(Y+R	c), s		5.2		5.2	5.2	\neg	5.2	5.2		5.1	5.2		5.1
Max Allow Head	dway (/	MAH), s		3.1		3.1	3.1		3.1	3.1		3.1	3.1		3.1
	: Allow Headway (MAH), s rue Clearance Time (g s), s					19.1	5.6	\top	10.2	7.4		25.3	5.1	\neg	18.7
Green Extensio	eue Clearance Time (g s), s en Extension Time (g e), s					0.7	0.1	\neg	0.0	0.0	-	4.5	0.2		4.3
Phase Call Proi	bability			0.99		1.00	0.90	,	1.00	0.99	,	1.00	0.92	2	1.00
Max Out Probal	en Extension Time (g e), s se Call Probability : Out Probability					0.00	0.00		1.00	1.00		0.00	0.00)	0.06
Movement Gro	un Res	ults			EB			WB			NB			SB	
Approach Move		74110		L	T	R	L	Т	R	L	т	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow F) veh/h		203	368		98	200	109	188	559	536	109	432	39
		ow Rate (s), veh/h/l	n	1767	1746		1767	1856	1572	1838	1856	1776	1838	1856	170
Queue Service				7.4	17.1		3.6	8.2	5.0	5 4	23.3	23.3	3.1	16.7	16.
Cycle Queue C				7.4	17.1		3.6	8.2	5.0	5.4	23.3	23.3	3.1	16.7	16.
Green Ratio (g		5 mile (g v), 5		0.32	0.24		0.28	0.2	0.20	0.44	0.36	0.36	0.43	0.35	0.3
Capacity (c), v				416	421		235	369	313	352	670	641	260	648	59
Volume-to-Capa		atio (X)		0.488	0.873		0.417	0.542		0.534	0.835	0.836	0.419	0.667	0.6
		t/In (95 th percentile)	137	294		68	166	85	99	346	326	56	264	24
		eh/ln (95 th percenti		5.3	11.5		2.6	6.5	3.3	3.9	13.5	13.0	2.2	10.3	9.0
		RQ) (95 th percent		0.75	0.00		0.59	0.00	0.74	0.99	0.00	0.00	0.47	0.00	0.0
Uniform Delay (22.5	30.8		25.1	30.4	29.1	17.1	24.7	24.7	19.1	23.3	23
Incremental De				0.3	2.3		0.4	0.9	0.2	0.4	0.6	0.7	0.3	0.3	0.3
Initial Queue De				0.0	0.0		0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (22.8	33.1		25.5	31.3	29.4	17.5	25.3	25.4	19.4	23.6	23.
Level of Service				C	C		C	C	C	В	C	C	B	C	C
Approach Delay				29.5		С	29.4		С	24.2		С	23.1		C
Intersection Del				23.5		_	5.5		-	24.2		_	C 23.1		
Multimodal Re					EB			WB			NB			SB	
Pedestrian LOS	Score	/LOS		2.28		В	2.29		В	2.10)	В	1.91	1	В
	ore / LC			1.43		Α	1.16		Α	1.36		Α	1.32		Α

Table 19. Pennsylvania Ave and JFK Rd Tuesday Noon-1PM HCS 20 Year Projection Conditions Optimized

Analysis of the projected traffic conditions in 20 years at the Pennsylvania Ave and JFK intersection on Tuesday from 12PM-1PM are shown above. Conditions were optimized to minimize overall delay and did so in the NB/SB directions. The NB direction saw a relatively significant drop in delay. The EB/WB directions delays increased (due to the fact that in order to minimize overall delay longer green times were needed for the NB/SB directions). The intersection maintained an acceptable level of service, going from an average delay of 27.3 seconds/vehicle to 25.5 seconds/vehicle after optimization (both delays receiving an acceptable level of service of C). The intersection sees a level of service of B for both the NB and SB left turns, a C for the EB and WB left turns, and C for all through movements.

General Inform	nation							Intersec	tion Inf	ormatio	n	l é	4341.	24 1/2
Agency								Duration	, h	1.000		-	414	
Analyst			Analy	sis Date	2/20/2	2024		Area Typ	e	Other				
Jurisdiction			Time	Period				PHF		1.00		4		÷
Urban Street		Wacker/JFK	Analy	sis Year	2024			Analysis	Period	1> 7:0	00	3		
Intersection		Wacker/JFK NOON-1PM	File N	ame	TUES	DAY Int	erse	ction (Wac	ker-JFK) 5YEA	Rproi	1	117	
Project Descrip	tion	Wacker/JFK TUESDAY									,,	7	4107	N In
Demand Inform	nation		7	EB			V	/B	T	NB			SB	
Approach Move				T	R			T R	1	T	R	1	T	□ R
Demand (v), v			378	3	67	4	_	5 5	83	537	5	14	444	22
Demand (v), v	CHAIT		310	,	01	_		5 5	00	331		17	777	22
Signal Informa	ition			I	т		Т	5_	\top	ш				
Cycle, s	55.2	Reference Phase 2	7	E	54		" ⊨ 3	7			-	Ψ	-	-4
Offset, s	0	Reference Point End	Green	110	4.3		11	0.7 1.2	0.0		1	2	3	¥
Uncoordinated	Yes	Simult. Gap E/W On	Yellov		0.0	16.6 4.0	3.		0.0	-			7	+
Force Mode	Fixed	Simult. Gap N/S On		1.5	0.0	1.5	2.		0.0		5	0	7	
Timer Results			EB		EDT	WBI		WBT	NBI		NBT	SBI	_	ODT
	_		EB	L	EBT	WBI	_			-			-	SBT
Assigned Phas	е		_		4		-	8	5		2	1		6
Case Number			-	_	10.0	_	-	12.0	1.1		4.0	1.1	_	4.0
Phase Duration	., -		+	_	16.2		_	6.7	10.3		26.4	6.0	_	22.1
Change Period		**	_		5.5		_	5.5	5.0	_	5.5	5.0	_	5.5
Max Allow Hea			\bot		3.3		_	3.2	3.1	_	3.1	3.1		3.1
Queue Clearan			_		9.7		_	2.2	5.4	_	16.7	2.3	-	10.9
Green Extension		(ge), S			0.9			0.0	0.2	_	4.0	0.0	_	4.0
				_	1.00			0.19	0.93		1.00	0.19		1.00
Max Out Proba	se Call Probability				0.00			0.00	0.00		0.00	0.00		0.00
Movement Gro	oup Res	ults		EB			W	В		NB			SB	
Approach Move			1	T	R	L	T	R	L	T	R	L	T	R
Assigned Move			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow I) veh/h	189	259	-1-7	7	- ·	7	174	569	567	14	352	310
		w Rate (ε), veh/h/ln	1810	1759		1850		1674	1810	1900	1894	1810	1900	168
Queue Service			5.2	7.7		0.2		0.2	3.4	14.7	14.7	0.3	8.8	8.9
Cycle Queue C			5.2	7.7		0.2		0.2	3.4	14.7	14.7	0.3	8.8	8.9
Green Ratio (g		e mine (yt), s	0.19	0.19		0.02		0.02	0.42	0.38	0.38	0.32	0.30	0.3
			350	340		39		36	414	720	718	202	573	50
	/CII/II		11 330	340		39		0.186	0.420	0.789	0.789	0.069	0.615	0.62
Capacity (c), v	acity Da	tio (V)	0.540	0.764		0.100			∥ U.4∠U	0.769	0.769	0.000	151	13
Capacity (c), v			0.540			0.186		000	E4	204	204			
Capacity (c), v Volume-to-Cap Back of Queue	(Q), fl	/In (95 th percentile)	90	133		4		4	51	201	201	5		
Capacity (c), v Volume-to-Cap Back of Queue Back of Queue	(Q), ft (Q), ve	/In (95 th percentile) eh/In (95 th percentile)	90	133 5.3		4 0.2		4 0.2	2.0	8.1	8.0	0.2	6.0	
Capacity (c), v Volume-to-Cap Back of Queue Back of Queue Queue Storage	(Q), ft (Q), ve Ratio (l/ln (95 th percentile) eh/ln (95 th percentile) RQ) (95 th percentile)	90 3.6 0.18	133 5.3 0.27		4 0.2 0.10		0.2 0.09	2.0 0.26	8.1 0.40	8.0 0.40	0.2	6.0	0.2
Capacity (c), v Volume-to-Cap Back of Queue Back of Queue Queue Storage Uniform Delay	(Q), ft (Q), ve Ratio ((d 1), s	v/In (95 th percentile) wh/In (95 th percentile) RQ) (95 th percentile) veh	90 3.6 0.18 20.1	133 5.3 0.27 21.1		4 0.2 0.10 26.6		4 0.2 0.09 26.6	2.0 0.26 11.5	8.1 0.40 15.2	8.0 0.40 15.2	0.2 0.08 14.3	6.0 0.30 16.6	0.2
Capacity (c), v Volume-to-Cap Back of Queue Back of Queue Queue Storage Uniform Delay Incremental De	(Q), ff (Q), ve Ratio ((d1), si	vIn (95 th percentile) eh/In (95 th percentile) RQ) (95 th percentile) veh), s/veh	90 3.6 0.18 20.1 0.5	133 5.3 0.27 21.1 1.3		4 0.2 0.10 26.6 0.8		0.2 0.09 26.6 0.9	2.0 0.26 11.5 0.1	8.1 0.40 15.2 0.4	8.0 0.40 15.2 0.4	0.2 0.08 14.3 0.1	6.0 0.30 16.6 0.4	0.2 16. 0.5
Capacity (c), v Volume-to-Cap Back of Queue Back of Queue Queue Storage Uniform Delay Incremental De Initial Queue D	(Q), fi (Q), ve Ratio ((d1), si lay (d2 elay (d	vin (95 th percentile) eh/in (95 th percentile) RQ) (95 th percentile) veh), s/veh s, s/veh	90 3.6 0.18 20.1 0.5 0.0	133 5.3 0.27 21.1 1.3 0.0		4 0.2 0.10 26.6 0.8 0.0		4 0.2 0.09 26.6 0.9 0.0	2.0 0.26 11.5 0.1 0.0	8.1 0.40 15.2 0.4 0.0	8.0 0.40 15.2 0.4 0.0	0.2 0.08 14.3 0.1 0.0	6.0 0.30 16.6 0.4 0.0	0.2 16. 0.5
Capacity (c), v Volume-to-Cap Back of Queue Back of Queue Queue Storage Uniform Delay Incremental De Initial Queue Do Control Delay ((Q), fi (Q), ve Ratio ((d1), si lay (d2 elay (d d), s/ve	vin (95 th percentile) eh/in (95 th percentile) RQ) (95 th percentile) veh), s/veh s, s/veh	90 3.6 0.18 20.1 0.5 0.0	133 5.3 0.27 21.1 1.3 0.0 22.5		4 0.2 0.10 26.6 0.8 0.0 27.5		4 0.2 0.09 26.6 0.9 0.0 27.6	2.0 0.26 11.5 0.1 0.0 11.6	8.1 0.40 15.2 0.4 0.0 15.6	8.0 0.40 15.2 0.4 0.0 15.6	0.2 0.08 14.3 0.1 0.0	6.0 0.30 16.6 0.4 0.0 17.0	0.2 16. 0.5 0.0
Capacity (c), v Volume-to-Cap Back of Queue Back of Queue Queue Storage Uniform Delay Incremental De Initial Queue D Control Delay (Level of Service	(Q), fi (Q), ve Ratio ((d1), si elay (d2 elay (d d), s/ve e (LOS)	vin (95 th percentile) eh/ln (95 th percentile) RQ) (95 th percentile) veh), s/veh s), s/veh	90 3.6 0.18 20.1 0.5 0.0 20.6	133 5.3 0.27 21.1 1.3 0.0 22.5		4 0.2 0.10 26.6 0.8 0.0 27.5 C		4 0.2 0.09 26.6 0.9 0.0 27.6	2.0 0.26 11.5 0.1 0.0 11.6 B	8.1 0.40 15.2 0.4 0.0 15.6 B	8.0 0.40 15.2 0.4 0.0 15.6 B	0.2 0.08 14.3 0.1 0.0 14.4 B	6.0 0.30 16.6 0.4 0.0 17.0	0.2 16. 0.5 0.0 17.
Capacity (c), v Volume-to-Cap Back of Queue Back of Queue Back of Queue Uniform Delay Uniform Delay Initial Queue Di Control Delay (Level of Service Approach Delay	(Q), fl (Q), ve Ratio ((d1), se lay (d2 elay (d d), s/ve e (LOS) y, s/veh	VIn (95 th percentile) sh/ln (95 th percentile) sh/ln (95 th percentile) RQ) (95 th percentile) veh), s/veh s), s/veh sh // LOS	90 3.6 0.18 20.1 0.5 0.0	133 5.3 0.27 21.1 1.3 0.0 22.5	C	4 0.2 0.10 26.6 0.8 0.0 27.5 C		4 0.2 0.09 26.6 0.9 0.0 27.6	2.0 0.26 11.5 0.1 0.0 11.6	8.1 0.40 15.2 0.4 0.0 15.6 B	8.0 0.40 15.2 0.4 0.0 15.6 B	0.2 0.08 14.3 0.1 0.0 14.4 B	6.0 0.30 16.6 0.4 0.0 17.0	0.2 16. 0.5 0.0
Capacity (c), v Volume-to-Cap Back of Queue Back of Queue Queue Storage Uniform Delay Initial Queue Di Control Delay (Level of Service Approach Delay	(Q), fl (Q), ve Ratio ((d1), se lay (d2 elay (d d), s/ve e (LOS) y, s/veh	VIn (95 th percentile) sh/ln (95 th percentile) sh/ln (95 th percentile) RQ) (95 th percentile) veh), s/veh s), s/veh sh // LOS	90 3.6 0.18 20.1 0.5 0.0 20.6	133 5.3 0.27 21.1 1.3 0.0 22.5		4 0.2 0.10 26.6 0.8 0.0 27.5 C		4 0.2 0.09 26.6 0.9 0.0 27.6	2.0 0.26 11.5 0.1 0.0 11.6 B	8.1 0.40 15.2 0.4 0.0 15.6 B	8.0 0.40 15.2 0.4 0.0 15.6 B	0.2 0.08 14.3 0.1 0.0 14.4 B	6.0 0.30 16.6 0.4 0.0 17.0	0.2 16.0 0.5 0.0 17.
Capacity (c), v Volume-to-Cap Back of Queue Back of Queue Back of Queue Storage Uniform Delay Incremental De Initial Queue Do Control Delay (Level of Servici Approach Delay Intersection De	(Q), fl (Q), ve Ratio ((d1), si elay (d2 elay (dd), s/ve e (LOS) y, s/veh lay, s/ve	VIn (95 th percentile) sh/ln (95 th percentile) sh/ln (95 th percentile) RQ) (95 th percentile) veh), s/veh s), s/veh sh // LOS	90 3.6 0.18 20.1 0.5 0.0 20.6	133 5.3 0.27 21.1 1.3 0.0 22.5 C		4 0.2 0.10 26.6 0.8 0.0 27.5 C	S	4 0.2 0.09 26.6 0.9 0.0 27.6 C	2.0 0.26 11.5 0.1 0.0 11.6 B	8.1 0.40 15.2 0.4 0.0 15.6 B	8.0 0.40 15.2 0.4 0.0 15.6 B	0.2 0.08 14.3 0.1 0.0 14.4 B	6.0 0.30 16.6 0.4 0.0 17.0	0.2 16. 0.5 0.0 17.
Capacity (c), v Volume-to-Cap Back of Queue Back of Queue Queue Storage Uniform Delay Incremental De Initial Queue D Control Delay (Level of Service	(Q), fi (Q), ve Ratio ((d1), si elay (d2 elay (d3), si e (LOS) y, si ve lay, si esults	Vin (95 th percentile) eh/ln (95 th percentile) RQ) (95 th percentile) RQ) (95 th percentile) Veh), s/veh s), s/veh eh / LOS	90 3.6 0.18 20.1 0.5 0.0 20.6	133 5.3 0.27 21.1 1.3 0.0 22.5 C		4 0.2 0.10 26.6 0.8 0.0 27.5 C	W	4 0.2 0.09 26.6 0.9 0.0 27.6 C	2.0 0.26 11.5 0.1 0.0 11.6 B	8.1 0.40 15.2 0.4 0.0 15.6 B	8.0 0.40 15.2 0.4 0.0 15.6 B	0.2 0.08 14.3 0.1 0.0 14.4 B	6.0 0.30 16.6 0.4 0.0 17.0 B	

Table 20. Wacker Dr and JFK Rd Tuesday Noon-1PM HCS 5 Year Projected Conditions

The 5-year pre-optimization projections at the Wacker Dr and JFK Rd intersection (displayed above in Table 20) show that vehicles experience an intersection delay level of service of B. By and large delay at the intersection is low, except for vehicles going westbound (exiting the PetSmart parking lot). NB/SB traffic experiences an average approach delay of between 15.1 and 17 seconds/vehicle while the EB/WB traffic sees approach delays of between 21.7 and 27.5 seconds/vehicle. Considering vehicles exiting the PetSmart parking lot have by far the lowest volume (and there is an alternative parking lot exit south of the intersection) it is expected that this direction (WB) would see significantly higher delay than other directions.

HCS Signalized Intersection Results Summary General Information Duration, h 1.000 Agency Analyst Analysis Date 2/20/2024 Area Type Other Jurisdiction Time Period Urban Street Wacker/JFK Analysis Year Analysis Period Intersection Wacker/JEK NOON-1PM File Name TUESDAY Inters ection (Wacker-JFK)_5YEARpr Project Description Wacker/JFK TUESDAY Demand Information EB WB NB Approach Movement 3 67 5 83 537 5 14 444 224 Demand (v), veh/h Signal Information 54.9 Reference Phase 517 Offset, s Reference Point End 10.6 Uncoordinated Yes Simult. Gap E/W On 0.0 Yellow 3.5 Red 1.5 Force Mode Fixed Simult. Gap N/S Timer Results EBL EBT WBL WBT NBL NBT SBL SBT Assigned Phase 10.0 12.0 4.0 Phase Duration, s 16.1 6.7 10.1 26.2 6.0 22.0 Change Period, (Y+Rc), s 5.5 5.5 5.0 5.5 5.0 5.5 3.3 3.2 3.1 Max Allow Headway (MAH), s 3.1 3.1 3.1 9.7 2.2 10.9 Queue Clearance Time (g s), s 16.5 Green Extension Time (g e), s 0.9 0.0 0.0 4.0 0.0 4.0 Phase Call Probability 1.00 0.19 0.93 1.00 0.19 1.00 Max Out Probability 0.00 0.00 1.00 0.00 0.03 0.00 Movement Group Results EB WB NB SB Approach Movement Assigned Movement 3 18 12 Adjusted Flow Rate (v), veh/h 189 259 172 564 562 14 352 316 Adjusted Saturation Flow Rate (s), veh/h/ln 1850 1674 1810 1759 1810 | 1900 | 1894 1810 | 1900 | 1685 Queue Service Time (g s), s 3.4 14.5 14.5 0.3 Cycle Queue Clearance Time (g c), s 5.2 7.7 0.2 0.2 3.4 14.5 14.5 0.3 8.8 8.9 Green Ratio (g/C) 0.19 0.19 0.02 0.02 0.42 0.38 0.38 0.32 0.30 0.30 Capacity (c), veh/h 350 340 40 36 412 717 715 203 575 510 0.540 0.762 Volume-to-Capacity Ratio (X) 0.186 0.419 0.785 0.785 0.186 0.069 | 0.613 | 0.620 Back of Queue (Q), ft/ln (95 th percentile) Back of Queue (Q), veh/ln (95 th percentile) 3.6 5.3 0.2 0.2 2.0 7.9 7.9 0.2 6.0 Queue Storage Ratio (RQ) (95 th percentile) 0.18 0.26 0.10 0.09 0.26 0.40 0.40 0.08 0.30 0.27 Uniform Delay (d 1), s/veh 20.0 21.0 26.5 26.5 11.5 15.2 15.2 14.3 16.5 16.5 Incremental Delay (d 2), s/veh 0.5 1.4 0.8 0.1 0.4 0.4 0.1 0.4 0.5 0.9 Initial Queue Delay (d s), s/veh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 Control Delay (d), s/veh 20.5 22.4 27.3 27.4 11.7 15.6 15.6 14.3 16.9 17.0 Level of Service (LOS) СС С С B B B В В В Approach Delay, s/veh / LOS Intersection Delay, s/veh / LOS Multimodal Results Bicycle LOS Score / LOS

Table 21. Wacker Dr and JFK Rd Tuesday Noon-1PM HCS 5 Year Projected Conditions Optimized

Intersection signal timing was optimized to minimize overall delay and successfully did so in all directions. Optimization produced slight decreases in delay, but nothing significant enough to improve the (already good) level of service of B. The average intersection delay/vehicle went from 16.9 seconds/vehicle to 16.8 seconds/vehicle.

HCS Signalized Intersection Results Summary General Information Intersection Information 1.000 Duration, h Agency Analysis Date 2/20/2024 Analyst Area Type Other Jurisdiction Time Period PHF 1.00 Urban Street Wacker/JFK Analysis Period 1> 7:00 Analysis Year 2024 Wacker/JFK NOON-1PM File Name TUESDAY Intersection (Wacker-JFK) 10YEARp Intersection Project Description Wacker/JFK TUESDAY Approach Movement Demand (v), veh/h 397 70 87 564 6 14 Signal Information Cycle, s 57.2 Reference Phase 0 Reference Point Offset, s Simult. Gap E/W Uncoordinated Yes On Fixed Simult. Gap N/S Timer Results EBT WBT NBL NBT Assigned Phase 10.0 12.0 4.0 4.0 Phase Duration, s 16.9 6.8 27.5 23.0 10.5 6.0 Change Period, (Y+Rc), s 5.5 5.5 5.0 5.5 5.0 5.5 3.2 3.1 3.1 3.1 Max Allow Headway (MAH), s 3.3 3.1 2.2 17.6 11.7 Queue Clearance Time (gs), s 10.4 5.6 2.3 Green Extension Time (g e), s 0.9 0.0 0.2 4.2 0.0 4.3 Phase Call Probability 1.00 0.21 0.94 1.00 0.20 1.00 Max Out Probability 0.00 0.00 0.00 0.00 0.00 0.00 Movement Group Results WB EB NB SB Approach Movement Т R Т R Т R R Assigned Movement 4 14 3 8 18 5 2 12 1 6 16 Adjusted Flow Rate (v), veh/h 199 272 8 178 583 581 14 370 331 Adjusted Saturation Flow Rate (s), veh/h/ln 1810 1759 1853 1687 1810 1900 1893 1810 1900 1685 Queue Service Time (gs), s 5.7 8.4 0.2 0.2 3.6 15.6 15.6 0.3 9.6 9.7 Cycle Queue Clearance Time (g c), s 5.7 8.4 0.2 0.2 3.6 15.6 15.6 0.3 9.6 9.7 Green Ratio (g/C) 0.20 0.20 0.02 0.02 0.43 0.38 0.38 0.33 0.31 0.31 Capacity (c), veh/h 361 351 42 38 405 733 730 197 584 518 Volume-to-Capacity Ratio (X) 0.550 0.773 0.188 0.187 0.438 0.796 0.796 0.071 0.633 0.639 Back of Queue (Q), ft/In (95 th percentile) 99 146 5 4 54 212 212 167 150 8.5 Back of Queue (Q), veh/ln (95 th percentile) 4.0 5.8 0.2 0.2 2.1 8.5 6.7 6.0 0.27 0.42 Queue Storage Ratio (RQ) (95 th percentile 0.20 0.29 0.11 0.10 0.42 0.08 0.33 0.30 20.7 21.7 Uniform Delay (d 1), s/veh 27.5 27.5 11.8 15.6 15.6 14.7 17.1 17.1 Incremental Delay (d 2), s/veh 0.5 1.4 8.0 0.9 0.1 0.4 0.4 0.1 0.4 0.5 0.0 0.0 Initial Queue Delay (d 3), s/veh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 21.1 23.1 14.8 17.5 28.3 Control Delay (d), s/veh 28.4 11.9 | 16.0 | 16.0 17.6 C Level of Service (LOS) C С С В В В В В В Approach Delay, s/veh / LOS 22.3 28.4 С 15.5 17.5 Intersection Delay, s/veh / LOS 17.4 Multimodal Results EB NB SB Pedestrian LOS Score / LOS 2 29 В 2 29 В 1.89 В 2 09 Bicycle LOS Score / LOS

Table 22. Wacker Dr and JFK Rd Tuesday Noon-1PM HCS 10 Year Projected Conditions

The 10-year pre-optimization projections at the Wacker Dr and JFK Rd intersection (displayed above in Table 19) show that vehicles experience an intersection delay level of service of B. Delay at the intersection is low, except for vehicles going westbound (exiting the PetSmart parking lot). NB/SB traffic experiences an average approach delay of between 15.5 and 17.5 seconds/vehicle while the EB/WB traffic sees approach delays of between 22.3 and 28.4 seconds/vehicle. Vehicles exiting the PetSmart parking lot have by far the lowest volume (and there is an alternative parking lot exit south of the intersection), so it is expected that this direction (WB) would see significantly higher delay than other directions.

HCS Signalized Intersection Results Summary General Information Intersection Information Agency Duration, h 1.000 Analyst Analysis Date 2/20/2024 Area Type Other Jurisdiction Time Period PHF 1.00 Urban Street Wacker/JFK Analysis Year 2024 Analysis Period 1> 7:00 Intersection Wacker/JFK NOON-1PM File Name TUESDAY Intersection (Wacker-JFK)_10YEARpr. Project Description Wacker/JFK TUESDAY Demand Information Approach Movement Т R 397 87 564 6 466 235 Demand (v), veh/h 3 70 6 5 14 Signal Information Reference Phase 56.7 Cycle, s Offset s 0 Reference Point End 11.3 Uncoordinated Yes Simult. Gap E/W On 0.0 Force Mode Fixed Simult. Gap N/S On Timer Results NBT SBL Assigned Phase 6 10.0 12.0 4.0 1.1 4.0 Case Number 1.1 Phase Duration, s 16.8 6.8 10.0 27.1 6.0 23.1 Change Period, (Y+Rc), s 5.5 5.5 5.0 5.5 5.0 5.5 Max Allow Headway (MAH), s 3.2 Queue Clearance Time (gs), s 10.3 2.2 5.6 17.3 11.6 Green Extension Time (ge), s 0.9 0.0 0.0 0.0 4.2 4.2 Phase Call Probability 1.00 0.21 0.94 1.00 0.20 1.00 Max Out Probability 0.00 0.00 1.00 0.01 0.00 0.00 Movement Group Results EΒ WB NB SB Approach Movement т т R Assigned Movement 7 4 14 3 8 18 5 2 12 6 16 Adjusted Flow Rate (v), veh/h 199 175 370 272 14 331 1810 1759 1853 1687 1810 1900 Adjusted Saturation Flow Rate (s), veh/h/ln 8.3 0.2 0.2 3.6 15.3 15.3 0.3 9.5 9.6 Queue Service Time (g s), s 5.6 Cycle Queue Clearance Time (gc), s 8.3 0.2 0.2 3.6 15.3 0.3 9.5 5.6 15.3 9.6 Green Ratio (g/C) 0.20 0.20 0.02 0.02 0.42 0.38 0.38 0.33 0.31 0.31 Capacity (c), veh/h 361 351 42 38 398 727 724 197 594 526 0.550 0.774 0.441 0.792 0.792 Volume-to-Capacity Ratio (X) 0.188 0.071 0.623 0.629 Back of Queue (Q), ft/ln (95 th percentile) 144 5 4 98 54 208 208 5 164 147 Back of Queue (Q), veh/ln (95 th percentile) 5.8 0.2 2.2 6.5 5.9 3.9 0.2 8.3 8.3 0.2 Queue Storage Ratio (RQ) (95 th percentile) 0.20 0.29 0.11 0.10 0.28 0.42 0.42 0.08 0.33 0.29 Uniform Delay (d 1), s/veh 20.5 21.6 27.3 27.3 11.9 15.6 15.6 14.5 16.7 16.7 Incremental Delay (d 2), s/veh 0.1 nitial Queue Delay (d ɜ), s/veh 0.0 0.0 0.0 Control Delay (d), s/veh 21.0 23.0 28.1 28.2 12.1 15.9 16.0 14.5 17.1 17.2 Level of Service (LOS) C С С С В В В В В В Approach Delay, s/veh / LOS 28.2 15.4 17.1 Intersection Delay, s/veh / LOS 17.2 Multimodal Results SB 2.29 1.89 2.09 Bicycle LOS Score / LOS 1.26 0.50 1.03

Table 23. Wacker Dr and JFK Rd Tuesday Noon-1PM HCS 10 Year Projected Conditions Optimized

Intersection signal timing was optimized to minimize overall delay and successfully did so in all directions. Optimization produced slight decreases in delay. The intersection maintained a level of service of B. The average intersection delay/vehicle went from 17.4 seconds/vehicle to 17.2 seconds/vehicle.

HCS Signalized Intersection Results Summary General Information Intersection Information Agency Duration, h 1.000 Analyst Analysis Date 2/20/2024 Area Type Other Jurisdiction Time Period PHF 1 00 Urban Street Wacker/JFK Analysis Year 2024 Analysis Period 1> 7:00 Wacker/JFK NOON-1PM TUESDAY Intersection (Wacker-JEK), 20YEARpr Intersection File Name Project Description Wacker/JFK TUESDAY **Demand Information** Approach Moveme Demand (v), veh/h 439 78 6 623 6 16 515 260 Signal Information 0.1 64.9 Reference Phase Cvcle, s 0 Reference Point Offset, s End Green 13.8 Yes Simult. Gap E/W Uncoordinated On Force Mode Fixed Simult. Gap N/S On Timer Results EBL EBT WBL WBT NBL NBT SBL SBT Assigned Phase Case Number 10.0 12.0 1.1 4.0 4.0 Phase Duration, s 19.3 7.1 11.3 32.3 6.3 27.2 Change Period, (Y+R ε), s 5.5 5.5 5.0 5.5 5.0 5.5 Max Allow Headway (MAH), s 3.3 3.2 3.1 3.1 3.1 3.1 2.3 6.2 Queue Clearance Time (a s), s 12.6 21.6 2.4 14.0 Green Extension Time (g e), s 1.0 0.0 5.0 Phase Call Probability 1.00 0.27 0.97 1.00 0.25 1.00 Max Out Probability 0.00 0.00 0.00 0.01 0.00 0.00 Movement Group Results EB R R R T R Approach Movement Assigned Movement 4 14 3 8 18 5 2 12 6 16 Adjusted Flow Rate (v) veh/h 220 302 9 8 196 643 641 16 410 365 Adjusted Saturation Flow Rate (s), veh/h/ln 1810 1759 1848 1676 1810 1900 1893 1810 1900 1684 Queue Service Time (g s), s 7.1 10.6 0.3 0.3 4.2 19.6 19.6 0.4 11.9 12.0 Cycle Queue Clearance Time (g c), s 7.1 10.6 0.3 0.3 4.2 19.6 19.6 0.4 11.9 12.0 Green Ratio (g/C) 0.21 0.21 0.02 0.02 0.47 0.41 0.41 0.36 0.33 0.33 Capacity (c), veh/h 385 374 46 42 397 786 783 182 637 565 Volume-to-Capacity Ratio (X) 0.570 0.806 0.194 0.194 0.494 0.818 0.818 0.088 0.644 0.647 128 255 Back of Queue (Q), ft/ln (95 th percentile) 190 6 6 66 256 6 208 191 Back of Queue (Q), veh/ln (95 th percentile) 5.1 7.6 0.3 0.2 2.6 10.2 10.2 0.3 8.3 7.6 Queue Storage Ratio (RQ) (95 th percentile) 0.26 0.38 0.14 0.13 0.34 0.51 0.51 0.10 0.42 0.38 Uniform Delay (d 1), s/veh 23.0 24.4 31.2 31.2 12.5 17.0 17.0 15.9 18 4 18 4 Incremental Delay (d 2), s/veh 0.5 1.6 0.8 0.8 0.1 0.3 0.3 0.1 0.4 0.5 Initial Queue Delay (d 3), s/veh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 12.7 17.3 17.3 Control Delay (d), s/veh 23.5 26.0 32.0 32.0 15.9 18.8 18.9 Level of Service (LOS) С С С С В В B В B Approach Delay, s/veh / LOS 25.0 32.0 С 16.7 В 18.8 Intersection Delay, s/veh / LOS 18.9 **Multimodal Results** Pedestrian LOS Score / LOS 2.29 2.30 В 1.89 В 2.10 Bicycle LOS Score / LOS

Table 24. Wacker Dr and JFK Rd Tuesday Noon-1PM HCS 20 Year Projected Conditions

The 20-year pre-optimization projections at the Wacker Dr and JFK Rd intersection (displayed above in Table 24) show that vehicles experience an intersection delay level of service of B. NB/SB traffic experiences an average approach delay of between 16.7 and 18.8 seconds/vehicle while the EB/WB traffic sees approach delays of between 25 and 32 seconds/vehicle. Vehicles exiting the PetSmart parking lot have by far the lowest volume (and there is an alternative parking lot exit south of the intersection), so it is expected that this direction (WB) would see significantly higher delay than other directions.

HCS Signalized Intersection Results Summary General Information Intersection Information Agency Duration, h 1 000 Analyst Analysis Date 2/20/2024 Area Type Other Jurisdiction Time Period PHF 1.00 2024 Analysis Period Urban Street Analysis Year 1> 7:00 Wacker/JFK NOON-1PM TUESDAY Intersection (Wacker-JFK)_20YEARpr Intersection Project Description **Demand Information** WB NB Approach Movement т R т т R Ŧ R Demand (v), veh/h 439 78 6 6 96 623 6 16 515 260 Signal Information 65.3 Reference Phase Cycle, s Offset s 0 Reference Point End Green Uncoordinated Yes Simult. Gap E/W On Yellow : Force Mode Fixed Simult. Gap N/S Timer Results EBL EBT WBT NBL NBT SBL SBT Assigned Phase 12 0 4 0 Case Number 10.0 40 Phase Duration, s 19.4 7.1 10.0 32.5 6.3 28.8 Change Period, (Y+R ε), s 5.5 5.0 5.5 3.2 3.1 Max Allow Headway (MAH), s 3.1 Queue Clearance Time (g s), s 12.7 6.4 21.7 13.7 Green Extension Time (g e), s 1.0 0.0 5.0 Phase Call Probability 1.00 0.27 0.97 1.00 0.25 1.00 Max Out Probability 0.00 0.00 1.00 0.00 0.00 0.00 Movement Group Results Approach Movem Assigned Movement 4 5 12 16 Adjusted Flow Rate (v), veh/h 220 302 196 643 641 16 410 Adjusted Saturation Flow Rate (s), veh/h/ln 1810 1759 1848 1676 1810 1900 1893 1810 1900 Queue Service Time (g s), s 19.7 10.7 19.7 11.6 11.7 7.2 0.3 0.3 4.4 0.4 Cycle Queue Clearance Time (g c), s 10.7 0.3 0.3 4.4 19.7 19.7 0.4 11.6 0.45 Green Ratio (q/C) 0.21 0.21 0.02 0.02 0.41 0.41 0.38 0.36 0.36 Capacity (c), veh/h 385 374 46 42 381 790 787 183 683 606 Volume-to-Capacity Ratio (X) 0.570 0.805 0.193 0.193 0.514 0.814 0.814 0.087 0.600 0.603 Back of Queue (Q), ft/In (95 th percentile) 129 192 6 70 257 256 6 202 Back of Queue (Q), veh/ln (95 th percentile) 5.2 77 0.3 0.2 2.8 10.3 10.3 0.2 8 1 7.3 Queue Storage Ratio (RQ) (95 th percentile 0.26 0.38 0.14 0.13 0.36 0.51 0.51 0.10 0.40 0.37 23.2 24.6 31.5 31.5 12.8 17.0 17.0 17.2 Uniform Delay (d 1), s/veh Incremental Delay (d 2), s/veh 0.5 1.6 0.7 8.0 0.2 0.3 0.3 0.1 0.3 0.4 0.0 0.0 0.0 Initial Queue Delay (d s), s/veh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 Control Delay (d), s/veh 23.7 26.2 32.2 32.3 13.0 17.3 17.3 15.4 17.5 17.6 Level of Service (LOS) С С С С В В В В В В Approach Delay, s/veh / LOS 32.2 16.7 17.5 Intersection Delay, s/yeh / LOS 18.6 **Multimodal Results** EB NB SB Pedestrian LOS Score / LOS 2.29 2.30 В 1.89 2.09 Bicycle LOS Score / LOS

Table 25. Wacker Dr and JFK Rd Tuesday Noon-1PM HCS 20 Year Projected Conditions Optimized

Intersection signal timing was optimized to minimize overall delay and successfully did so in the NB/SB directions. EB/WB traffic saw increases in approach delay of .2 seconds/vehicle. The intersection maintained a level of service of B. The average intersection delay/vehicle went from 18.9 seconds/vehicle to 18.6 seconds/vehicle.

Saturday, February 10th, 2024:

HCS Signalized Intersection Results Summary General Information Intersection Information Agency Analysis Date 5/1/2024 Jurisdiction Time Period PHF 1.00 Urban Street Analysis Year 2024 Analysis Period 1> 7:00 Project Description **Demand Information** Approach Movement 105 141 86 147 776 82 107 721 147 193 181 176 Signal Information 个 71.5 Reference Phase Cycle, s 0 Reference Point End Uncoordinated Yes Simult. Gap E/W On Force Mode Fixed Simult. Gap N/S Timer Results Assigned Phase Case Number 13.4 11.3 11 4 25.7 5.1 Change Period, (Y+R o), s 5.2 5.2 5.2 5.1 Max Allow Headway (MAH), s Queue Clearance Time (g s), s 16.3 16.1 18.2 Green Extension Time (q e), s 0.3 1.1 1.2 3.5 0.88 1.00 1.00 Phase Call Probability 1.00 1.00 0.93 0.88 1.00 Max Out Probability 0.00 0.00 0.01 0.49 Movement Group Results EB Approach Movement 4 14 Assigned Movement Adjusted Flow Rate (v), veh/h 357 141 86 137 405 107 1767 1704 1767 1856 1572 1767 1856 1793 1767 1856 1746 Adjusted Saturation Flow Rate (s), veh/h/lr Queue Service Time (g a), s Cycle Queue Clearance Time (g c), s 5.9 14.3 4.6 3.2 3.7 14.1 14.1 2.9 16.2 Green Ratio (q/C) 0.33 0.24 0.30 0.22 0.22 0.38 | 0.29 | 0.29 0.38 | 0.29 | 0.29 492 417 270 401 340 302 545 527 Capacity (c), veh/h 299 536 504 0.393 0.856 0.389 0.352 0.253 0.452 0.743 0.744 0.357 0.835 Volume-to-Capacity Ratio (X) Back of Queue (Q), ft/In (95 th percentile) 102 243 56 89 53 64 241 230 50 309 290 Back of Queue (Q), veh/ln (95 th percentile) 0.56 0.00 0.49 0.00 0.46 0.64 0.00 0.00 0.41 0.00 0.00 Queue Storage Ratio (RQ) (95 th percentile Uniform Delay (d 1), s/veh 18.2 25.8 20.1 23.8 23.3 17.2 22.8 22.8 16.9 23.9 23.9 0.3 0.7 0.7 0.3 7.1 0.2 2.0 0.3 0.2 0.1 Incremental Delay (d 2), s/vel nitial Queue Delay (d 3), s/veh Control Delay (d), s/veh 18.4 27.9 20.4 24.0 23.4 17.6 23.5 23.5 17.2 31.0 31.5 Level of Service (LOS) CC Approach Delay, s/veh / LOS Intersection Delay, s/veh / LOS Multimodal Results 2.10 2.28 2.28 1.91 Bicycle LOS Score / LOS

Table 26.Pennsylvania Ave and JFK Rd Saturday Noon-1PM HCS 5 Year Projection Conditions

The table above is an overview of the projected 5-yr conditions during Saturday from 12PM-1PM, showcasing results across various movement groups. Notably, the absence of data in the EB right movement is explained by the apparent configuration at the top right of the table indicating synchronization between the through movement and the right movement, consolidating data from both sections. Of particular significance for analysis are several key variables: Control Delay, Level of Service (LOS), Approach Delay alongside corresponding LOS, and the overall intersection delay and LOS. Examination of these variables reveals that the Pennsylvania and JFK intersection operates at an average LOS of C, which falls within acceptable parameters. There is no indication of approaching an undesirable LOS of D or exceeding a delay threshold of 35 s/veh. In summary, the existing operational signaling demonstrates effective functionality for the 5-yr projection, ensuring smooth traffic flow within acceptable parameters.

HCS Signalized Intersection Results Summary General Information Intersection Information Agency Duration, h 1.000 Analysis Date 5/1/2024 Analyst Area Type Other Jurisdiction Time Period PHF 1.00 Urban Street JFK Rd Analysis Year 2024 Analysis Period 1> 7:00 Intersection Wacker_Penn 5yr Update 12-1(Overall Delay).xus Project Description Demand Information EB WB NB SB Approach Movement R 193 181 176 105 141 86 147 776 82 107 721 147 Signal Information Cycle, s 73.5 Reference Phase 112 Reference Point Green Yes Simult. Gap E/W On Fixed Simult. Gap N/S Timer Results EBT WBL WBT NBL NBT SBL SBT Assigned Phase 4.0 Case Number 1.1 4.0 1.1 3.0 1.1 4.0 1.1 Phase Duration, s 12.2 23.3 11.4 22.5 11.8 27.4 11 4 27.1 Change Period, (Y+Rc), s 5.2 5.2 5.2 5.2 5.2 5.1 5.2 5.1 Max Allow Headway (MAH), s 3.1 3.2 3.1 3.2 3.1 3.1 3.1 8.1 16.8 18.4 Queue Clearance Time (gs), s 5.8 16.4 Green Extension Time (g e), s 0.0 1.2 0.2 0.2 3.6 0.0 3.4 1.2 Phase Call Probability 1.00 1.00 0.88 1.00 0.94 1.00 0.89 1.00 Max Out Probability 1.00 0.00 0.00 0.00 0.00 0.00 1.00 0.05 Movement Group Results Approach Movement R R R Assigned Movement 8 16 18 Adjusted Flow Rate (v), veh/h 193 357 105 141 86 136 405 391 107 447 421 Adjusted Saturation Flow Rate (s) veh/h/ln 1767 1704 1767 1856 1572 1767 1856 1793 1767 1856 1746 Queue Service Time (g s), s 6.1 14.8 32 4.6 3.3 3.8 14.3 14.4 2.9 16.4 16.4 14.3 16.4 Cycle Queue Clearance Time (g c), s 6.1 14.8 3.2 4.6 3.3 3.8 14.4 16.4 Green Ratio (g/C) 0.33 0.25 0.32 0.23 0.23 0.39 0.30 0.30 0.39 0.30 0.30 484 420 268 438 371 523 Capacity (c), veh/h 305 565 546 305 556 0.850 0.392 0.322 0.232 0.447 0.716 0.717 0.351 0.804 0.805 Volume-to-Capacity Ratio (X) 0.399 Back of Queue (Q), ft/ln (95 th percentile) 250 264 107 57 89 53 65 244 232 51 283 Back of Queue (Q), veh/ln (95 th percentile) 4.2 9.7 2.2 3.5 2.1 2.5 9.5 9.3 2.0 11.1 10.6 Queue Storage Ratio (RQ) (95 th percentile) 0.59 0.00 0.49 0.00 0.46 0.65 0.00 0.00 0.42 0.00 0.00 Uniform Delay (d 1), s/veh 18.7 26.5 20.0 23.3 22.8 17.2 22.9 22.9 16.9 23.9 23.9 Incremental Delay (d 2), s/veh 1.9 0.3 0.2 0.1 0.3 0.6 0.6 1.1 Initial Queue Delay (d 3), s/veh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 18.9 28.5 20.4 23.5 22.9 17.6 23.4 23.4 Control Delay (d), s/veh 17.2 24.9 25.0 Level of Service (LOS) В С С C C В С С В C С Approach Delay, s/veh / LOS 25.1 22.4 22.6 24.1 Intersection Delay, s/veh / LOS 23.6 Multimodal Results EB WB NB SB Pedestrian LOS Score / LOS 1 91 Bicycle LOS Score / LOS 1.04 1.29

Table 27.Pennsylvania Ave and JFK Rd Saturday Noon-1PM HCS 5 Year Projection Conditions Optimized

Displayed in the table above are the optimized results for the 5-yr projected conditions at Pennsylvania and JFK intersection during Saturday from 12PM -1PM, building upon the

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previously examined 5-yr conditions. Significantly, improvements are evident, particularly in the overall intersection delay, which has decreased by 1.9 s/veh. Upon closer examination, it becomes clear that while the control delay and approach delay remain mostly constant across certain movements, they have notably decreased in the NB direction as the approach delay decreases by 5.6 s/veh. This is ultimately the control delay and approach delay in the NB direction have the contributing factors in the optimization to bring the overall intersection delay down. This optimization strategy strategically manages delay in each direction, effectively aligning with the traffic volume dynamics of the intersection. In essence, these optimizations were able to minimize overall intersection delay to maintain an acceptable LOS.

HCS Signalized Intersection Results Summary General Information Intersection Information Duration, h 1.000 Agency Analyst Analysis Date Area Type Other Time Period PHF 1.00 Jurisdiction JFK Rd Urban Street Analysis Year 2024 Analysis Period 1> 7:00 Intersection File Name Wacker Penn 10yr Update 12-1.xus Project Description **Demand Information** ΕB WB NB SB Т Т Approach Movement R 155 113 758 Demand (v), veh/h 203 190 184 110 91 815 86 148 155 Signal Information 74.5 Reference Phase Cycle, s Offset, s 0 Reference Point End 16.4 24 Green Uncoordinated Yes Simult Gap F/W On Yellow Force Mode Fixed Simult, Gap N/S On **Timer Results** EBL EBT WBL WBT NBL NBT SBT Assigned Phase Case Number 1.1 4.0 3.0 1.1 4.0 4.0 1.1 1.1 Phase Duration, s 13.9 24.1 11.5 21.6 11.8 27.4 27.1 11.5 Change Period, (Y+Rc), s 5.2 5.2 5.2 5.1 5.1 5.2 5.2 5.2 Max Allow Headway (MAH), s 3 1 32 3 1 32 3 1 3 1 3 1 3 1 Queue Clearance Time (g $\mathfrak s$), $\mathfrak s$ 8 4 17.7 5 4 7.0 6.1 17.5 5.2 19.8 Green Extension Time (g e), s 0.3 12 0.1 12 0.3 3.8 0.1 2.1 Phase Call Probability 1.00 1.00 0.90 1.00 0.95 1.00 0.90 1.00 Max Out Probability 0.00 0.00 0.69 **Movement Group Results** ΕВ WB NB SB Approach Movement R R R R Assigned Movement 3 8 18 4 14 16 12 Adjusted Flow Rate (v), veh/h 374 148 143 410 443 Adjusted Saturation Flow Rate (s), veh/h/ln 1767 1705 1767 1856 1767 1856 1793 1767 1856 1572 17.8 Queue Service Time (a s), s 6.4 15.7 3.4 5.0 4.1 15.5 17.8 3.6 15.5 3.2 Cycle Queue Clearance Time (go), s 6.4 15.7 3.4 5.0 3.6 4.1 15.5 15.5 3.2 17.8 17.8 Green Ratio (g/C) 0.34 0.25 0.31 0.22 0.22 0.39 0.30 0.30 0.38 0.30 0.30 Capacity (c), veh/h 493 432 263 409 347 288 557 538 549 516 290 Volume-to-Capacity Ratio (X) 0.412 0.866 0.419 0.362 0.263 0.497 0.761 0.762 0.390 0.857 0.857 Back of Queue (Q), ft/ln (95 th percentile) 113 263 62 98 58 71 261 248 55 351 329 2.3 2.4 2.8 2.1 Back of Queue (Q), veh/ln (95 th percentile) 4.4 10.3 3.8 10.2 9.9 13.7 13.2 Queue Storage Ratio (RQ) (95 th percentile) 0.62 0.00 0.54 0.00 0.51 0.71 0.00 0.00 0.46 0.00 0.00 Uniform Delay (d 1), s/veh 18 7 26.6 20.9 246 24 1 18 1 23 7 23 7 177 248 248 Incremental Delay (d 2), s/veh 0.2 2.1 0.4 0.2 0.1 0.4 0.7 0.7 0.3 10.4 11.1 Initial Queue Delay (d 3), s/veh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 Control Delay (d), s/veh 18.9 28.8 21.3 24.8 24.4 Level of Service (LOS) В D 25.3 23.6 С 33.6 Approach Delay, s/veh / LOS 23.6 Intersection Delay, s/yeh / LOS 27.4 **Multimodal Results** EB NB SB Pedestrian LOS Score / LOS 2.28 2.28 В 2.10 1.91 Bicycle LOS Score / LOS 1.44 1.06 Α 1.36 1.33 Copyright © 2024 University of Florida, All Rights Reserved.

Table 28.Pennsylvania Ave and JFK Rd Saturday 12PM-1PM HCS 10 Year Projection Conditions

The table provided above is an overview of the projected 10-yr conditions during Saturday from 12-1 pm, showcasing results across various movement groups. There is no indication of approaching an undesirable LOS of D or exceeding a delay threshold of 35 s/veh. In summary, the existing operational signaling demonstrates effective functionality for the 10-yr projection, ensuring smooth traffic flow within acceptable parameters.

General Inforn	nation								Intersec	tion Inf	ormatio	on	Į,	4501	ЯŲ
Agency									Duration	h	1.000			411	
Analyst				Analys	is Date	5/1/20	24		Area Typ	е	Other		4		
Jurisdiction				Time F	Period				PHF		1.00		1		
Urban Street		JFK Rd		Analys	is Year	2024		\neg	Analysis	Period	1> 7:0	00	- 2		
Intersection				File N		-	er Penr		Update 1				1	346	
Project Descrip	tion							, .					7	4107	M
Demand Inform	nation				EB			WE			NB			SB	
Approach Move					T	R	L	T		L	T	□ R	L	T T	T
Demand (v), v				203	190	184	110	14		155	815	86	113	758	15
Demand (V), V	en/n	_	_	203	190	104	110	144	91	155	015	00	113	/50	13
Signal Informa	tion						IJ.				8				
Cycle, s	78.1	Reference Phase	2		2	_	12.4.0	_ 2		K	F			7	t
Offset. s	111	Reference Point	End		1	150	7 51		F			1	2	8	
Uncoordinated	Yes	Simult. Gap E/W	On	Green		0.3	24.4	6.4		17.1					
Force Mode	_		0	Yellow		0.0	4.0	4.0		4.0		7	Ψ	Y .	4
roice Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		6	0	-	-
Times Deer !!				F.D.		CDT	14/2		IMPT	NE		NDT	000		CDT
Timer Results				EBI	-	EBT	WB	L	WBT	NBI	-	NBT	SBI	-	SBT
Assigned Phas	e			3		8	7		4	1	_	6	5	_	2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration				14.4		25.1	11.6	_	22.3	11.9		29.8	11.6		29.5
Change Period				5.2 3.1		5.2	5.2		5.2	5.2		5.1	5.2		5.1
	Allow Headway (MAH), s ue Clearance Time (g s), s					3.2	3.1		3.2	3.1		3.1	3.1		3.1
	ue Clearance Time (g s), s					18.4	5.6	_	7.3	6.2		18.0	5.2		20.3
Green Extension	n Time	(ge),s		0.4		1.2	0.2		1.2	0.2		3.8	0.1		3.8
Phase Call Pro	bability			1.00		1.00	0.91	1	1.00	0.96	6	1.00	0.92	2	1.00
Max Out Proba	bility			0.00		0.00	0.00)	0.00	0.00		0.02	0.04	1	0.02
Movement Gro		sults			EB			WB			NB			SB	_
Approach Move				L	Т	R	L	Т	R	L	T	R	L	T	F
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	1:
Adjusted Flow	Rate (v), veh/h		203	374		110	148	91	144	426	412	113	470	44
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1767	1705		1767	1856	1572	1767	1856	1793	1767	1856	17
Queue Service	Time (g s), S		6.8	16.4		3.6	5.3	3.8	4.2	16.0	16.0	3.2	18.3	18
Cycle Queue C	learanc	e Time (gε), s		6.8	16.4		3.6	5.3	3.8	4.2	16.0	16.0	3.2	18.3	18
Green Ratio (g	/C)			0.34	0.25		0.30	0.22	0.22	0.40	0.32	0.32	0.40	0.31	0.3
Capacity (c), v				492	437		259	407	345	292	588	568	295	581	54
Volume-to-Cap		itio (X)		0.413	0.857		0.424	0.364	0.264	0.493	0.724	0.725	0.383	0.810	0.8
		t/ln (95 th percentile)	121	274		67	104	62	74	270	257	57	313	29
		eh/ln (95 th percenti		4.7	10.7		2.6	4.1	2.4	2.9	10.5	10.3	2.2	12.2	11
		RQ) (95 th percent		0.66	0.00		0.58	0.00		0.73	0.00	0.00	0.47	0.00	0.0
Uniform Delay				19.7	27.9		22.2	26.0	_	18.2	23.8	23.8	17.7	24.8	24
Incremental De				0.2	2.0		0.4	0.2	0.2	0.4	0.6	0.6	0.3	1.1	1.
Initial Queue D		**		0.2	0.0		0.4	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.
Control Delay (19.9	29.8		22.6	26.2		18.7	24.4	24.4	18.0	25.9	26
				19.9 B	29.8 C		C C	26.2 C	25.6 C	18.7 B	24.4 C	24.4 C	18.0 B	25.9 C	-
Level of Service				_		_	_								ΓĆ
Approach Dela	•			26.3		С	24.9	,	С	23.5		С	25.1		С
Intersection De	iay, s/ve	en / LOS				24	4.8						С		
Multimodal Re	sults				EB			WB			NB			SB	
Pedestrian LOS	Score	/LOS		2.28		В	2.28	3	В	2.10		В	1.91		В
Bicycle LOS So	ore / LO	os		1.44		Α	1.06	3	Α	1.36		Α	1.33	3	Α
•	ore / LO			1.44		A		6	A		_	A	1.33		

Table 29.Pennsylvania Ave and JFK Rd Saturday 12PM-1PM HCS 10 Year Projection Conditions Optimized

Displayed in the table above are the optimized results for the 10-yr projected conditions at Pennsylvania and JFK intersection during Saturday from 12PM-1PM, building upon the previously examined 10-yr conditions. Significantly, improvements are evident, particularly in the overall intersection delay, which has decreased by 2.6 s/veh. Upon closer examination, it becomes clear that while the control delay and approach delay remain mostly constant across certain movements, they have notably decreased in the NB direction as the approach delay decreases by 8.5 s/veh. This ultimately indicates the control delay and approach delay in the NB direction have the main contributing factors in the optimization to bring the overall intersection delay down. This optimization strategy manages delay in each direction, effectively aligning with the traffic volume dynamics of the intersection. In essence, these optimizations were able to minimize overall intersection delay to maintain an acceptable LOS.

HCS Signalized Intersection Results Summary General Information Intersection Information Duration, h Agency Analysis Date 5/1/2024 Analyst Area Type Other Jurisdiction Time Period 1.00 JFK Rd Analysis Period 1> 7:00 Urban Street Analysis Year 2024 Intersection File Name Wacker Penn 20vr Update 12-1.xus Project Description Approach Movement 171 901 124 837 Demand (v), veh/h 210 204 122 164 100 Signal Information Cvcle, s 80.8 Reference Phase Offset, s 0 Reference Point End 18.7 Uncoordinated Yes Simult. Gap E/W On Yellow 4.0 Force Mode Fixed Simult. Gap N/S Timer Results EBL EBT WBL WBT NBT SBT NBL Assigned Phase 4.0 Case Number 4.0 4.0 15.1 11.8 23.9 30.0 29.7 Phase Duration, s 27.3 12.1 Change Period, (Y+R c), s 5.2 5.2 Max Allow Headway (MAH), s 3.1 3.2 3.1 3.2 3.1 3.1 3.1 Queue Clearance Time (g s), s 9.6 20.9 6.1 8.0 20.5 23.9 Green Extension Time (g e), s 0.3 0.2 0.3 4.3 0.7 Phase Call Probability 1.00 1.00 0.94 1.00 0.97 1.00 0.94 1.00 0.00 0.00 0.00 Max Out Probability 0.02 0.00 0.00 0.04 1.00 Movement Group Results WB Approach Movement R R R Assigned Movement 3 8 14 16 225 414 156 Adjusted Flow Rate (v), veh/h 122 164 100 461 446 489 Adjusted Saturation Flow Rate (s), veh/h/ln 1767 1704 1767 1856 1572 1767 1856 1793 1767 1856 1746 Queue Service Time (g s), s 18.9 4.1 4.8 Cycle Queue Clearance Time ($g \circ$), s 4.1 6.0 4.2 4.8 21.9 Green Ratio (g/C) 0.36 0.27 0.31 0.23 0.23 0.39 0.31 0.31 0.39 467 Capacity (c), veh/h 498 248 431 365 257 571 552 266 565 531 0.887 0.452 0.491 0.381 0.274 0.605 0.807 0.467 Volume-to-Capacity Ratio (X) 0.807 0.920 0.920 Back of Queue (Q), ft/ln (95 th percentile) 136 330 76 118 70 86 308 293 67 487 Back of Queue (Q), veh/ln (95 th percentile) 5.3 12.9 3.0 4.6 2.7 3.3 12.0 11.7 2.6 19.0 18.3 Queue Storage Ratio (RQ) (95 th percentile) 0.75 0.00 0.66 0.00 0.61 0.86 0.00 0.00 0.56 0.00 0.00 Uniform Delay (d 1), s/veh 19 4 28.2 22 6 26.2 25.5 20.1 25.8 25.8 19.6 27.2 27.2 Incremental Delay (d 2), s/veh 0.2 7.5 0.6 0.2 0.1 0.7 0.9 0.9 0.5 25.7 Initial Queue Delay (d 3), s/veh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 Control Delay (d), s/veh 19.7 35.6 23.2 26.4 25.6 20.9 26.7 26.7 20.1 52.9 Level of Service (LOS) В D С С С С С С С D Approach Delay, s/veh / LOS 30.0 25.2 49.9 **Multimodal Results** Pedestrian LOS Score / LOS 2 28 2 28 2 11 1 92 1.42 Bicycle LOS Score / LOS 1.54 1.12 В 1.45

Table 30.Pennsylvania Ave and JFK Rd Saturday 12PM-1PM HCS 20 Year Projection Conditions

The table provided above is an overview of the projected 20-yr conditions during Saturday from 12PM - 1 PM, showcasing results across various movement groups. There is a concern for the 20-yr projections as based on the 1% growth rate provided to use for volume projections. As the SB through and right movements exceed the acceptable threshold by 15-20 s/veh. Also the EB through movement hits the unacceptable LOS mark by 0.6 s/veh. In summary, the existing operational signaling indicates that geometric changes will need to be examined at this intersection within the 20-yr window of this corridor to ensure smooth traffic flow within acceptable parameters.

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HCS Signalized Intersection Results Summary General Information Agency Duration h 1 000 Analysis Date 5/1/2024 Analyst Area Type Other Jurisdiction Time Period Urban Street JFK Rd Analysis Year 2024 Analysis Period 1> 7:00 Intersection File Name Wacker_Penn 20yr Update 12-1(Overall Delay).xus Project Description Demand Information EB NB WB Approach Movement 225 210 204 122 164 100 171 901 95 124 837 171 89.8 Reference Phase Cycle, s 92 Reference Point End Offset s Simult. Gap E/W Uncoordinated Yes On Fixed Simult. Gap N/S Timer Results EBL EBT WBL WBT NBL NBT SBL SBT Assigned Phase Case Number Phase Duration, s 16.3 29.8 11.9 25.5 12.6 36.1 11.9 35.4 Change Period, (Y+Rc), s 5.2 5.2 5.2 5.2 5.2 5.1 5.2 5.1 Max Allow Headway (MAH), s 3.2 3.1 3.1 Queue Clearance Time (g s), s Green Extension Time (g e), s 0.4 0.9 0.0 0.3 4.3 0.2 Phase Call Probability 1.00 1.00 0.95 1.00 0.98 1.00 0.96 1.00 Max Out Probability 0.00 0.00 1.00 0.04 0.00 0.04 0.00 0.03 Movement Group Results EB SB Approach Movement Assigned Movement 18 Adjusted Flow Rate (v), veh/h 225 414 122 164 100 156 463 448 124 519 489 Adjusted Saturation Flow Rate (s), veh/h/lr 1767 1704 1767 1856 1572 1767 1856 1793 1767 1856 1746 Queue Service Time (a s), s 8.5 4.7 6.8 4.8 5.1 19.8 19.8 4.0 23.4 23.4 8.5 21.2 Cycle Queue Clearance Time (g c) 6.8 4.8 19.8 19.8 Green Ratio (g/C 0.37 0.27 0.31 0.23 0.23 0.43 0.35 0.35 0.42 0.34 Capacity (c), veh/h 488 470 231 421 357 270 645 624 278 630 592 0.579 0.718 0.718 Volume-to-Capacity Ratio (X) 0.462 0.881 0.528 | 0.389 | 0.280 0.446 | 0.825 | 0.825 Back of Queue (Q), ft/ln (95 th percentile) 155 344 90 138 82 93 327 310 73 Back of Queue (Q), veh/ln (95 th percentile) 13.4 3.5 5.4 3.2 3.6 12.8 12.4 2.9 6.1 Queue Storage Ratio (RQ) (95 th percentile 0.85 0.00 0.78 0.00 0.71 0.93 0.00 0.00 0.61 0.00 0.00 Uniform Delay (d 1), s/veh 21.5 31.6 26.1 29.9 29.1 20.9 25.8 25.8 19.8 27.6 27.6 Incremental Delay (d 2), s/veh 0.3 2.2 0.7 0.2 0.2 0.6 0.5 0.5 0.4 1.1 Initial Queue Delay (d 3), s/veh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 Control Delay (d), s/veh 21.7 33.8 26.8 30.1 29.2 21.5 26.3 26.3 20.2 28.7 28.8 Level of Service (LOS) С С Approach Delay, s/veh / LOS 29.6 28.8 25.6 Intersection Delay, s/yeh / LOS Multimodal Results EB WB NB SB 2 29 1 92 Pedestrian LOS Score / LOS В 1.12 1.42 Bicycle LOS Score / LOS Α ated: 5/1/2024 6:13:34 PM

Table 31.Pennsylvania Ave and JFK Rd Saturday 12PM-1PM HCS 20 Year Projection Conditions Optimized

Displayed in the table above are the optimized results for the 10-yr projected conditions at Pennsylvania and JFK intersection during Saturday from 12PM-1PM, building upon the previously examined 10-yr conditions. Significantly, improvements are evident, particularly in the overall intersection delay, which has decreased by 2.6 s/veh.

While the control delay and approach delay remain mostly constant across certain movements, they have notably decreased in the NB direction as the approach delay decreases by 8.5 s/veh. This ultimately indicates the control delay and approach delay in the NB direction have the main contributing factors in the optimization to bring the overall intersection delay down. This optimization strategy strategically manages delay in each direction, effectively aligning with the traffic volume dynamics of the intersection. In essence, these optimizations were able to minimize overall intersection delay to maintain an acceptable LOS.

General Inform	nation									Into	react	ion Infe	ormatic	\n	T i	4744	Ja L
Agency	iation									-	ation,		1.000			417	
				Analys	io Dota) E /d	1/202	14	_	-			Other		- 2		
Analyst Jurisdiction				Analys Time F		5 3/1	1/202	.4		PHE	а Туре =	5	1.00		-		
		IEIX D.4		_		- 000	0.4			-		D11	_	20	- 1		
Urban Street		JFK Rd			is Yea	$\overline{}$			F			Period	1> 7:0	00	- 5		
Intersection	41	JFK/Wacker		File Na	ame	Ivva	аскег	_Penn	эуг	Upda	ate 12-	-1.XUS			- 1	ጎተት	h C
Project Descrip	uon															3 1 7 1	IR(III)
Demand Infor	mation				EB				V	/B			NB			SB	
Approach Move				L	T	Т	R	L	_	T	R	1	T	R	L	T	Т
Demand (v), v				446	12	\rightarrow	69	20	-	2	24	165	542	5	14	474	3
Demand (V),				440	12			20		-		100	042		14	41.4	
Signal Informa	ation				ΠŢ	Т		121	Т	5_		\top					
Cycle, s	81.4	Reference Phase	2	1	8	Ι,	5小刀	Φ2	,≝	\sim	1		1	-	₽		~
Offset, s	0	Reference Point	End	Green	21	2.	<u>JIL.</u>	20.5	1/	5.9	7.2	0.0		1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	Off	Yellow		3.		26.5	3.		3.0	0.0		< /		7	÷
Force Mode	Fixed	Simult. Gap N/S	Off	Red	1.5	1.		1.5	2.		2.5	0.0		5	6	7	
Timer Results				EBI		EBT	T	WBL		WE	ВТ	NBI		NBT	SBI		SB
Assigned Phas	е					4	\neg		\neg	8	3	5		2	1		6
Case Number						10.0			\dashv	12	.0	2.0		4.0	2.0		4.0
Phase Duration	1, S					22.4	\rightarrow		\neg	12	-	14.4	\rightarrow	39.2	7.1	\rightarrow	32.0
Change Period		c), S				5.5	1		\rightarrow	5.	_	5.0	-	5.5	5.0	-	5.5
Max Allow Hea						3.2	7		7	3.		3.1		3.0	3.1	_	3.2
Queue Clearan						15.8	1		+	3.	-	9.4		10.3	2.7	$\overline{}$	24.2
Green Extension		1.0				1.0	-		+	0.	_	0.1		1.0	0.0	-	2.2
Phase Call Pro		(9 =), 3		_	+	1.00	-		\dashv	1.0	-	0.98		1.00	0.30	-	1.00
Max Out Proba				_	_	0.00	_		\dashv	0.0	_	0.07		0.00	0.00	-	0.00
Wax Out Floba	Dility					0.00				0.0	00	0.07		0.00	0.00		0.00
Movement Gro	oup Res	ults			EB		т		W	В	\neg		NB			SB	
Approach Move	ement			L	Т	R	7	L	Т	Т	R	L	Т	R	L	Т	П
Assigned Move	ment			7	4	14	4	3	8	\neg	18	5	2	12	1	6	1
Adjusted Flow	Rate (v), veh/h		223	304		\neg	30		\neg	26	165	274	273	16	533	4
		w Rate (s), veh/h/l	n	1767	1725		7	1795		_	1595	1767	1856	1849	1767	1856	15
Queue Service		4 - 11		9.3	13.8		7	1.2		-	1.3	7.4	8.3	8.3	0.7	22.2	2
		e Time (g o), s		9.3	13.8		1	1.2		_	1.3	7.4	8.3	8.3	0.7	22.2	22
Green Ratio (g		(30/10		0.21	0.21		7	0.09		_	0.09	0.12	0.41	0.41	0.03	0.33	0.
Capacity (c), v				367	358		-	159		_	141	204	769	766	47	604	5
Volume-to-Cap		tio (X)		0.608	0.849		+	0.186		_	.188	0.810	0.356	0.357	0.344	0.883	0.8
		/In (95 th percentile)	178	246		-	24		-	22	151	152	148	15	328	2
		eh/In (95 th percenti		6.9	9.6		-	1.0		_	0.9	5.9	5.9	5.9	0.6	12.8	1
		RQ) (95 th percent		0.36	0.49		-	0.55		\rightarrow	0.9	0.30	0.30	0.30	0.03	0.66	0.
Uniform Delay			110)	29.3	31.1	-	-	34.5		_	34.5	35.2	16.4	16.4	39.0	26.1	26
				0.6	2.3		-	0.2		_	0.2	35.2	0.1	0.1	0.8	0.9	1
Incremental De				0.6	0.0		-	0.2		_	0.2	0.0	0.1	0.1	0.0	0.9	0
Initial Queue D				_			-			_		38.8					-
Control Delay (311		29.9	33.4		-	34.7		- 3	34.7		16.5	16.5	39.9	27.0	2
Level of Servic		/1.00		C	C	_	-	C 24.7			C	D 04.7	В	В	D 07.0	С	T.
Approach Dela				31.9	,	С		34.7		С	_	21.7		С	27.3)	С
Intersection De	iay, s/ve	en / LOS					26.	ŏ			_				С		
									14.				NE			0.5	
Multimodal Re		// 00		0.00	EB		-	0.61	WI		-	1.90	NB		0	SB	
Pedestrian LOS	Score	/ LUS		2.30	_	В	4	2.31	_	В	_		_	В	2.11	_	В
Bicycle LOS So				1.36		Α		0.53		Α		1.08		Α	1.21		Α

Table 32. Wacker Dr and JFK Rd Saturday 12PM-1PM HCS 5 Year Projection Conditions

The table above provides a rundown of the 5-yr projected conditions during Saturday from 12PM-1PM at Wacker and JFK, displaying results across various movement groups. Notably, the absence of data in the EB right and WB through movement is explained by the apparent configuration at the top right of the table indicating synchronization between the through movement and the right movement of the EB direction, as for the WB the configuration combines the through movements with its respective turning lane consolidating data from both sections. Of particular significance for analysis are several key variables: Control Delay, Level of Service (LOS), Approach Delay alongside corresponding LOS, and the overall intersection delay and LOS. Examination of these variables reveals that the Wacker and JFK intersection operates at an average LOS of C, which falls within acceptable parameters. There is one indication of approaching an undesirable LOS of D or exceeding a delay threshold of 35 s/veh at the SB left movement. In summary, the overall existing operational signaling demonstrates effective functionality, ensuring smooth traffic flow within acceptable parameters.

Table 33. Wacker Dr and JFK Rd Saturday 12PM-1PM HCS 5 Year Projection Conditions Optimized

General Inform	ation								Intersec	tion Inf	ormatio	on	1 2	43.40	IF U
Agency									Duration	, h	1.000			417	
Analyst				Analys	is Date	5/1/20	24		Area Typ	e	Other		4		
Jurisdiction				Time F	eriod				PHF		1.00		2 3		
Urban Street		JFK Rd		Analys	is Year	2024			Analysis	Period	1> 7:0	00	7		
Intersection		JFK/Wacker		File N		-	r Penn	5vr	Update 12					112	
Project Descrip	tion							-,-	_			,,	7	4100	1- 11
Demand Inform	4:				EB				/B		NB			SB	
					_	T 5		_	_		_			_	٠.
Approach Move				L	T	R	L	-	T R	L	T	R	L	T	F
Demand (v), v	eh/h		_	446	12	69	20	1	2 24	165	542	5	14	474	38
Signal Informa	tion				ΙŢ		IJ	Т	5-		П				
Cycle, s	81.3	Reference Phase	2	1	e	542	4:	,K	7			∠	シ	-	4
Offset, s	0	Reference Point	End	0	24	2.2			6.8 7.2			1	2	3	Ŋ
Uncoordinated	Yes	Simult. Gap E/W	Off	Green Yellow		3.5	26.4 4.0	16		0.0	_			7	+
Force Mode	Fixed	Simult. Gap N/S	Off	Red	1.5	1.5	1.5	2.		0.0		6	0	7	-
Timer Results				EBI	-	EBT	WBI	-	WBT	NBI	L	NBT	SBI	-	SBT
Assigned Phase	•			_	_	4		4	8	5	_	2	1	\perp	6
Case Number				_	-	10.0		4	12.0	2.0	-	4.0	2.0	\rightarrow	4.0
Phase Duration	1 -				_	22.3		_	12.7	14.4	_	39.1	7.1		31.9
Change Period,	(Y+R	c), S			-	5.5		_	5.5	5.0		5.5	5.0		5.5
Max Allow Head	dway (/	MAH), s				3.2			3.2	3.1		3.0	3.1		3.2
Queue Clearan	ce Time	(gs), s				15.8		_	3.3	9.4		10.3	2.7		24.1
Green Extensio	n Time	(ge),s				1.0			0.0	0.1		0.7	0.0		2.2
Phase Call Prol	bability					1.00			1.00	0.98	3	1.00	0.30		1.00
Max Out Probal	bility					0.00			0.00	0.02	2	0.06	0.00		0.00
Movement Gro	up Res	sults			EB			W	3		NB			SB	
Approach Move				L	Т	R	L	Т	R	L	T	R	L	T	F
Assigned Move				7	4	14	3	8	18	5	2	12	1	6	1
Adjusted Flow F) veh/h		223	304		30	_	26	165	274	273	16	533	45
•		ow Rate (s), veh/h/l	n	1767	1725		1795		1595	1767	1856	1849	1767	1856	15
Queue Service		,		9.3	13.8		1.2		1.3	7.4	8.3	8.3	0.7	22.1	22
Cycle Queue C		•		9.3	13.8		1.2		1.3	7.4	8.3	8.3	0.7	22.1	22
Green Ratio (g		c mile (ge), s		0.21	0.21		0.09		0.09	0.12	0.41	0.41	0.7	0.32	0.3
Capacity (c), v				366	357		159		141	204	768	766	47	603	51
Volume-to-Capa		itio (X)		0.609	0.851		0.186		0.188	0.810	0.357	0.357	0.345	0.884	0.8
		t/In (95 th percentile	١	177	246		24		22	150	151	148	15	332	28
		t/in (95 th percentile eh/in (95 th percenti		6.9	9.6		1.0		0.9	5.8	5.9	5.9	0.6	13.0	11
			_	_	0.49		0.55		0.49	0.30	0.30	0.30	0.03	0.66	0.
Uniform Delay (RQ) (95 th percent	ne)	0.35 29.3	31.1		34.4		34.4	35.1	16.4	16.4	39.0	26.0	26
Incremental De				0.6	2.3		0.2		0.2	3.0	0.1	0.1	0.9	1.0	1
Initial Queue De				0.0	0.0		0.2		0.2	0.0	0.1	0.1	0.9	0.0	0
Control Delay (29.9	33.3		34.6		34.6	38.1	16.5	16.5	39.8	27.0	27
Level of Service				C	C		C C		C	D D	B	B	D D	C C	21
Approach Delay	<u> </u>			31.9	_	С	34.6		C	21.5		C	27.3		-c
Intersection Delay				31.8		26			U	21.3			C 21.3		U
	uj, sive	200				20							Ĭ		
Multimodal Re	sults				EB			W	3		NB			SB	
Pedestrian LOS	Score	/LOS		2.30		В	2.31	T	В	1.90)	В	2.11		В
Pedesilian LOS															

The table above presents the optimized results for the Wacker and JFK intersection during Saturday from 12PM-1PM, expanding upon the previously analyzed 5-yr projected conditions. Although marginal, improvements are observable, particularly in the total intersection delay,

which has decreased by a modest 0.1 s/veh. Upon closer look, it is evident that while the control delay and approach delay have remained relatively stable across most movements, there has not been much improvement to delay at this intersection. This optimization strategy does not improve traffic delay through this software by a marginal amount therefore it will need to be investigated with a more sophisticated software to allow the exact configuration of the Wacker and JFK intersection. In essence, these optimizations from HCS are unable to enhance traffic flow within the intersection needing a more in-depth analysis tool to dissect this intersection.

A	41								l to de		in a last				ALL ALL S	N/III
General Inform	nation								-		ion Inf		on	- É	411	
Agency						Ina			-	ration,		1.000				
Analyst						5/1/20)24		Are	а Тур	e	Other				
Jurisdiction				Time F								1.00		*		•
Urban Street		JFK Rd			is Year	-					Period	1> 7:0	00	- 5		
Intersection		JFK/Wacker		File Na	ame	Wack	er_Penn	10y	r Upo	date 1	2-1.xus			- 9	ጎተት	11.0
Project Descrip	tion														NULLARIA	KIII
Demand Inforr	nation				EB			٧	/B			NB			SB	
Approach Move	ement			L	Т	R	T L	Т	T	R	1	Т	R	L	T	T
Demand (v), v	eh/h			468	13	76	21	1	2	25	173	570	6	14	498	40
, ,-																
Signal Informa	tion				1		2	Τ,	. 2			l				
Cycle, s	88.5	Reference Phase	2		15	50	2 h	ηĘ		1			` .			~
Offset, s	0	Reference Point	End	Green	2.3	3.2	29.8	19	9.1	7.6	0.0				-	N K
Uncoordinated	Yes	Simult. Gap E/W	Off	Yellow		3.5	4.0	3.		3.0	0.0		\ 4	<u> </u>	. ▶	4
Force Mode	Fixed	Simult. Gap N/S	Off	Red	1.5	1.5	1.5	2.	5	2.5	0.0		5	6	7	
								-								
Timer Results				EBI	-	EBT	WBI	-		ВТ	NBI	-	NBT	SBL	-	SBT
Assigned Phase	e			<u> </u>	_	4	⊢	-		В	5	_	2	1	+	6
Case Number				<u> </u>	-	10.0	-	-	_	2.0	2.0		4.0	2.0	\rightarrow	4.0
Phase Duration				\vdash	_	24.6	_	-		3.1	15.5		43.5	7.3	_	35.3
Change Period		*		<u> </u>	_	5.5	-	-		.5	5.0	_	5.5	5.0	+	5.5
Max Allow Head		,,		_	-	3.2	-	-		.2	3.1	_	3.0	3.1	\rightarrow	3.2
Queue Clearan				-	-	18.0	-	-		.4	10.5	—	11.3	2.8	-	27.4
Green Extensio		(g e), S		-	_	1.0	_	-	0.	_	0.1	_	1.0	0.0	_	2.3
Phase Call Prol				-	-	1.00 0.01	_	\dashv		00	0.99	-	1.00 0.00	0.00		0.00
Max Out Proba	Dility					0.01			0.0	00	0.22		0.00	0.00		0.00
Movement Gro	up Res	ults			EB			W	В			NB			SB	
Approach Move	ement			L	Т	R	L	Т	Т	R	L	Т	R	L	Т	F
Assigned Move	ment			7	4	14	3	8	Т	18	5	2	12	1	6	1
Adjusted Flow F	Rate (v), veh/h		234	323		31		\neg	27	173	288	288	16	560	47
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1767	1723		1794		1	1594	1767	1856	1849	1767	1856	15
Queue Service	Time (g =), S		10.6	16.0		1.4		\neg	1.4	8.5	9.3	9.3	8.0	25.4	25
Cycle Queue C	learanc	e Time (g o), s		10.6	16.0		1.4			1.4	8.5	9.3	9.3	0.8	25.4	25
Green Ratio (g	/C)			0.22	0.22		0.09		- 1	0.09	0.12	0.43	0.43	0.03	0.34	0.:
Capacity (c), v	/eh/h			382	372		154			137	209	798	795	46	626	53
Volume-to-Cap	acity Ra	itio (X)		0.613	0.868		0.198		0	0.200	0.826	0.362	0.362	0.350	0.895	0.8
Back of Queue	(Q), f	t/In (95 th percentile)	202	291		28			25	188	173	168	16	370	31
Back of Queue	(Q), ve	eh/In (95 th percenti	le)	7.9	11.4		1.1		_	1.0	7.4	6.8	6.7	0.6	14.5	12
Queue Storage	Ratio (RQ) (95 th percent	ile)	0.40	0.58		0.63			0.56	0.38	0.35	0.35	0.03	0.74	0.0
Uniform Delay ((d 1), s	/veh		31.4	33.6		37.7		- (37.7	38.2	17.1	17.1	42.5	27.9	27
Incremental De	lay (d 2), s/veh		0.6	5.6		0.2		_	0.3	8.9	0.1	0.1	0.8	0.9	1.
Initial Queue De	elay (d	з), s/veh		0.0	0.0		0.0		_	0.0	0.0	0.0	0.0	0.0	0.0	0.
Control Delay (eh		32.0	39.1		37.9		- (38.0	47.1	17.2	17.2	43.3	28.8	29
Level of Service				С	D		D			D	D	В	В	D	С	
Approach Delay				36.2	2	D	37.9		[)	24.1		С	29.1		С
Intersection De	lay, s/ve	h / LOS				29	9.4							С		
Multimodal Re		// 00		0.00	EB		0.01	W	_	-	4.00	NB	_	0.11	SB	_
Pedestrian LOS				2.30	\rightarrow	В	2.31	\rightarrow		3	1.90	$\overline{}$	В	2.11	_	В
Bicycle LOS So				1.41		Α	0.54		P		1.11		Α	1.25		Α

Table 34. Wacker Dr and JFK Rd Saturday 12PM-1PM HCS 10 Year Projection Conditions

The table above provides a rundown of the 10-yr projected conditions during Saturday from 12PM-1PM at Wacker and JFK, displaying results across various movement groups. There are multiple unacceptable movements as shown in the table above. This shows undesirable LOS of D or exceeding a delay threshold of 35 s/veh at all movements in certain directions. In summary, the overall existing operational signaling demonstrates ineffective functionality, causing large delays and unacceptable traffic flow through the corridor.

HCS Signalized Intersection Results Summary General Information Intersection Information Agency Duration, h 1.000 Analysis Date 5/1/2024 Other Analyst Area Type Time Period 1.00 JFK Rd 2024 Analysis Period 1> 7:00 Urban Street Analysis Year nn 10yr Update 12-1(Overall Delay).xus Project Description Demand Information FB Approach Movement L R R R 468 76 12 25 173 570 6 Demand (v), veh/h 13 21 14 Signal Information 89.9 Reference Phase Cycle, s Offset, s 0 Reference Point End 19.6 Green Off Yes Simult. Gap E/W Force Mode Fixed Simult. Gap N/S Off Red Timer Results EBT WBT NBT SBL SBT Assigned Phase 12.0 13.2 44.3 Phase Duration, s 25.1 15.7 35.9 Change Period, (Y+R ε), s 5.0 5.5 5.5 3.2 Max Allow Headway (MAH), s 3.2 3.1 3.2 Queue Clearance Time (gs), s 18.3 3.4 10.6 11.5 2.8 27.8 Green Extension Time (ge), s 1.2 0.0 0.0 0.2 0.6 2.3 Phase Call Probability 1.00 1.00 1.00 0.33 1.00 0.99 Max Out Probability 0.00 0.01 0.01 0.24 0.00 Movement Group Results Approach Movement R R Assigned Movement 4 14 18 12 16 Adjusted Flow Rate (v), veh/h 234 323 31 27 173 288 288 16 560 476 1767 1723 Adjusted Saturation Flow Rate (s), veh/h/lr 1794 1594 1767 1856 1849 1767 1856 1578 Queue Service Time (g s), s 10.8 16.3 8.6 9.4 25.8 25.8 1.4 1.4 9.5 8.0 10.8 16.3 1.4 8.6 9.4 9.5 0.8 25.8 25.8 Green Ratio (g/C 0.22 0.22 0.09 0.09 0.12 0.43 0.43 0.03 0.34 Capacity (c), veh/h 386 376 153 136 212 802 799 46 628 534 0.201 Volume-to-Capacity Ratio (X) 0.607 0.859 0.199 0.818 0.360 0.360 0.347 0.891 0.892 Back of Queue (Q), ft/ln (95 th percentile) 205 284 28 25 176 176 172 16 383 327 Back of Queue (Q), veh/ln (95 th percentile) 11.1 1.1 6.9 0.6 15.0 8.0 1.0 6.9 6.9 Queue Storage Ratio (RQ) (95 th percentile) 0.41 0.57 0.64 0.58 0.35 0.35 0.35 0.03 0.77 0.67 Uniform Delay (d 1), s/veh 31.8 34.0 38.4 38.8 17.3 28.3 28.3 Incremental Delay (d 2), s/veh 0.6 2.3 0.2 0.3 3.0 0.1 0.1 0.9 1.0 Initial Queue Delay (d 3), s/veh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 Control Delay (d), s/veh 32.4 36.3 38.7 38.7 41.8 17.4 17.4 44.1 29.3 29.5 D Level of Service (LOS) D D B B Approach Delay, s/veh / LOS Intersection Delay, s/veh / LOS Multimodal Results 2.30 В 1.90 Pedestrian LOS Score / LOS

Table 35. Wacker Dr and JFK Rd Saturday 12PM-1PM HCS 10 Year Projection Conditions Optimized

The table above presents the optimized results for the Wacker and JFK intersection during Saturday from 12PM-1PM, expanding upon the previously analyzed 20-yr projected conditions. Although marginal, improvements are observable, particularly in the total intersection delay, which has decreased by a modest 0.4 s/veh. Upon closer look, it is evident that while the control delay and approach delay have remained relatively stable across most movements, there has not been much improvement to delay at this intersection. This optimization strategy does not improve traffic delay through this software therefore it will need to be investigated with a more sophisticated software to allow the exact configuration of the Wacker and JFK intersection. In essence, these optimizations from HCS are does maintain a overall LOS of C.

HCS Signalized Intersection Results Summary General Information Intersection Information Duration, h 1.000 Agency Analyst Analysis Date 5/1/2024 Area Type Jurisdiction Time Period PHF 1.00 Urhan Street JEK Rd Analysis Year 2024 Analysis Period 1> 7:00 Intersection JFK/Wacke File Name Wacker Penn 20vr Update 12-1.xus Project Description **Demand Information** EB WB NB SB Approach Movement R Demand (v), veh/h 517 15 84 23 13 28 192 630 6 16 550 449 Signal Information 106.3 Reference Phase Offset s Reference Point End Uncoordinated Yes Simult, Gap E/W Off ellow Force Mode Fixed Simult. Gap N/S Timer Results EBT WBT NBL NBT SBL SBT Assigned Phase Case Number 10.0 12.0 2.0 4.0 2.0 4.0 14.0 18.4 54.6 7.9 44.1 Phase Duration, s 29.8 Change Period, (Y+R o), s 5.0 5.5 5.5 Max Allow Headway (MAH), s 3.2 3.2 3.1 3.0 3.1 3.2 Queue Clearance Time (g s), s 23.5 3.9 13.3 13.9 3.1 36.0 Green Extension Time (ge), s 0.9 0.1 0.1 1.1 0.0 2.6 Phase Call Probability 1.00 1.00 1.00 1.00 1.00 0.42 Max Out Probability 0.00 1.00 0.00 Movement Group Results ΕB WB SB Approach Movement Assigned Movement 7 4 14 8 18 5 2 12 1 6 16 Adjusted Flow Rate (v) veh/h 259 358 34 30 192 318 318 18 617 527 Adjusted Saturation Flow Rate (s), veh/h/ln 1767 1724 1794 1578 1590 1767 1856 1849 1767 1856 34.0 Queue Service Time (g a), s 14.1 21.5 1.9 1.9 11.3 11.9 11.9 1.1 33.7 Cycle Queue Clearance Time (g o), s 14.1 21.5 1.9 1.9 11.3 11.9 Green Ratio (g/C) 0.23 0.23 0.08 0.08 0.13 0.46 0.46 0.03 0.36 0.36 Capacity (c), veh/h 405 395 143 127 222 856 853 49 674 574 Volume-to-Capacity Ratio (X) 0.639 0.906 0.236 0.238 0.865 0.372 0.372 0.377 0.915 0.920 Back of Queue (Q), ft/ln (95 th percentile) 258 424 38 34 276 220 214 22 484 415 Back of Queue (Q), veh/ln (95 th percentile) 16.5 18.9 10.1 10.8 8.6 Queue Storage Ratio (RQ) (95 th percentile 0.52 0.85 0.86 0.77 0.55 0.44 0.44 0.04 0.97 0.85 Uniform Delay (d 1), s/veh 370 399 45.9 45.9 45.6 18.6 18.6 50.8 32.3 Incremental Delay (d 2), s/veh 0.9 20.1 0.3 0.4 27.0 0.1 0.1 0.7 2.6 3.3 Initial Queue Delay (d 3), s/veh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 Control Delay (d), s/veh 37.9 60.0 46.2 46.3 72.6 18.7 18.7 51.5 34.9 35.7 Level of Service (LOS) D D E B B Approach Delay, s/veh / LOS 50.7 46.2 31.2 35.5 Intersection Delay, s/veh / LOS 37.9 2.31 В 2.32 В 1 91 В Pedestrian LOS Score / LOS В Bicycle LOS Score / LOS 1.50 В 0.54 Α 1.17 Α 1.32

Table 36.Wacker Dr and JFK Rd Saturday Noon-1PM HCS 20 Year Projection Conditions

The table above provides a rundown of the 20-yr projected conditions during Saturday from 12PM-1PM acceptable movements as shown in the table above. This shows undesirable LOS of D or exceeding a delay threshold of 35 s/veh at all movements in certain directions. In summary, the overall existing operational signaling demonstrates ineffective functionality, causing large delays and unacceptable traffic flow through the corridor.

General Inform	nation								Into	react	ion Info	ormatic	ND.	1	4241	F U
	nation											1.000		- é	नगर	
Agency				Anal	ie Det-	EMP	24		-	ation,		Other				
Analyst						5/1/20	124		PHI	а Тур	e					
Jurisdiction		JFK Rd		Time F		2021					David of	1.00	20	4		
Urban Street					is Year			20			Period	1> 7:0		- 1		
Intersection		JFK/Wacker		File Na	ame	Wack	er_Penn	20y	r Upo	date 1	2-1(Ove	erali De	lay).xus		111	
Project Descrip	tion							-	_	_				-	N 1 97 W	NIII.
Demand Inform	mation				EB			V	VB			NB			SB	
Approach Move				L	T	T R	1		T	R	1	T	R	1	T	T R
Demand (v), v				517	15	84	23	-		28	192	630	6	16	550	44
Demand (v), v	CIDII			317	13	- 04	23		5	20	102	000		10	330	-
Signal Informa	ation				Iι	$\overline{}$	121	т	5_		\top	_				
Cycle, s	108.2	Reference Phase	2	1		54	2 4	"Ľ	; =	1		1	-	Þ		4
Offset, s	0	Reference Point	End	Green	20	5.8	39.3	21	5.1	8.5	0.0		1	2	3	¥
Uncoordinated	Yes	Simult. Gap E/W	Off	Yellow		3.5	4.0	3.		3.0	0.0				7	+
Force Mode	Fixed	Simult. Gap N/S	Off	Red	1.5	1.5	1.5	2.		2.5	0.0		6	0	7	
Timer Results				EBI	.	EBT	WBI	L	W		NBL	-	NBT	SBI	-	SBT
Assigned Phas	е					4			8	3	5		2	1		6
Case Number						10.0			12	.0	2.0		4.0	2.0		4.0
Phase Duration	1, S					30.6			14	.0	18.8		55.6	8.0		44.8
Change Period	, (Y+R	;), S				5.5			5.	5	5.0		5.5	5.0		5.5
Max Allow Hea	dway (/	/AН), s				3.2			3.	2	3.1		3.0	3.1		3.2
Queue Clearan	ce Time	(gs), S				23.8			3.	9	13.5	5	14.0	3.1		36.6
Green Extension	n Time	(ge), s				1.3			0.	1	0.3		1.1	0.0		2.7
Phase Call Pro	bability					1.00			1.0	00	1.00)	1.00	0.42	2	1.00
Max Out Proba	bility					0.00			0.0	00	0.00		0.00	0.00)	0.00
Movement Gro	oun Doo	ulto			EB			W	n			NB			SB	
Approach Move		uits		L	T	R	L	T		R	L	T	R	L	T	R
Assigned Move				7	4	14	3	8	_	18	5	2	12	1	6	16
Adjusted Flow		\ voh/h		259	358	14	34	0	-	30	192	318	318	18	617	52
), ven/n w Rate (s), veh/h/l	n	1767	1724		1794		1	590	1767	1856	1849	1767	1856	157
Queue Service			11	14.3	21.8		1.9		_	1.9	11.5	12.0	12.0	1,1	34.4	34.
Cycle Queue C				14.3	21.8		1.9			1.9	11.5	12.0	12.0	1.1	34.4	34.
		e nine (gr), s		0.23	0.23		0.08			0.08	0.13	0.46	0.46	0.03	0.36	0.3
Green Ratio (g	, - ,			410	400		142		_	126	225	859	857	48	674	57
Capacity (c), v Volume-to-Cap		tio (V)		0.631	0.895		0.238		_	.241	0.853	0.371	0.371	0.378	0.916	_
		In (95 th percentile	١	261	368		39		- 10	35	229	223	218	23	500	42
		h/in (95 in percentile h/in (95 th percenti	,	10.2	14.4		1.5			1.4	9.0	8.7	8.7	0.9	19.5	17.
	V 71		,						_			0.45				_
		RQ) (95 th percent	iie)	0.52	0.74		0.88 46.8		_	0.79	0.46 46.2	18.8	0.45 18.8	0.05 51.7	1.00	33.
Uniform Delay				37.4	40.3				_	46.8						
Incremental De		**		0.6	3.0		0.3		_	0.4	3.7	0.1	0.1	0.9	1.1	1.4
Initial Queue D				0.0	0.0		0.0		_	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (- 71	#11		38.0	43.3		47.1		- 4	47.2	49.9	18.9	18.9	52.6	34.0	34.
Level of Service		11.00		D	D	_	D 47.0			D	D 20.4	В	В	D	C	_ c
Approach Dela	* *			41.1		D	47.2			,	26.1		С	34.5		С
Intersection De	lay, s/ve	n / LOS				33	3.7							С		
Maritim and all D					ED			10.				NID			000	
Multimodal Re		11.00		2.24	EB	D.	2.00	W		-	4.04	NB	n	24	SB	_
Pedestrian LOS				2.31	_	В	2.32 0.54	\rightarrow	E A	_	1.91	-	B A	2.11	-	В
Bicycle LOS So																Α

Table 37. Wacker Dr and JFK Rd Saturday 12 PM-1PM HCS 20 Year Projection Conditions Optimized

The table above presents the optimized results for the Wacker and JFK intersection during Saturday from 12PM-1PM, expanding upon the previously analyzed 20-yr projected conditions. Although marginal, improvements are observable, particularly in the total intersection delay, which has decreased by 3.8 s/veh. Upon closer look, it is evident that while the control delay and approach delay have changed drastically across most movements with a decrease of nearly 10 s/veh for the approach delays and 15 s/veh for the EB through and NB left turn, there has been much improvement to delay at this intersection. This optimization strategy does improve traffic delay through this software therefore it will provide Wacker and JFK intersection to efficiently run with a LOS C. As seen the highlighted portions in red are indicating high areas of concern and will need to be considered when looking to decide between geometric and operational changes to these intersections. In essence, these optimizations from HCS did maintain an overall LOS of C.

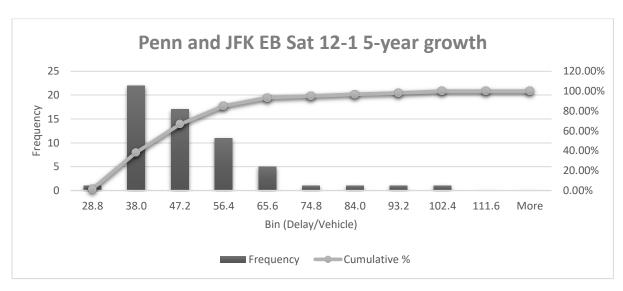


Figure 16. The total delay/vehicle the Penn and JFK intersection going eastbound experienced during the 60 simulation runs from 12-1 on a Saturday with a 5-year population growth.

Using a 1% population growth rate to project traffic volumes 5 years into the future, the team found that at the Pennsylvania and JFK intersection, eastbound traffic experienced a total delay per vehicle of 47.2 seconds or less for 70 percent of simulation runs using extrapolated traffic volumes from Saturday, (February 10th, 2024). The minimum delay per vehicle for the EB direction was found to be 28.8 seconds, while the maximum delay was 102.4 seconds (with an average delay of 45.7 seconds). With 95 percent confidence, one could say that the total delay per vehicle would fall between 42 and 49.3 seconds for the eastbound traffic at Pennsylvania Ave and JFK. Compared to existing conditions where the total delay per vehicle would be between 41 and 47.5 seconds with 95 percent confidence. Since there is some overlap between the two intervals, the change in the total delay per vehicle 5 years from now would not be significant.

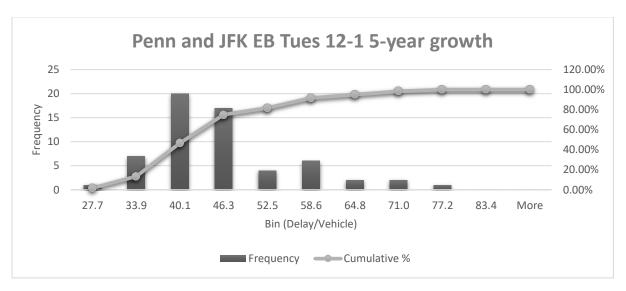


Figure 17. The total delay/vehicle the Penn and JFK intersection going eastbound experienced during the 60 simulation runs from 12PM-1PM on a Tuesday with a 5-year population growth.

Using projected traffic volumes from the Tuesday (February 6th, 2024) the total delay per vehicle 5 years from now was found to be 46.3 seconds or less for 70 percent of simulation runs. The minimum delay per vehicle for the EB direction was found to be 27.7 seconds, while the maximum delay was 77.2 seconds, with an average delay of 43.7 seconds. With 95 percent confidence, one could say that the total delay per vehicle of eastbound traffic would fall between 41 and 46.2 seconds. Comparing that to the existing, the total delay per vehicle would be between 38.3 and 42.8 seconds with 95 percent confidence. Since there is some overlap between the two intervals, the change in the total delay per vehicle 5 years from now would not be significant.

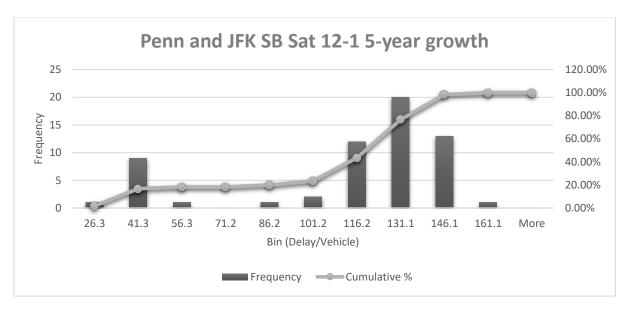


Figure 18. The total delay/vehicle the Penn and JFK intersection going southbound experienced during the 60 simulation runs from 12PM-1PM on a Saturday with a 5-year population growth.

For Southbound traffic at Pennsylvania Ave and JFK (in 5 years), 70 percent of simulations totaled a delay per vehicle of 131.1 seconds or less. The minimum delay per vehicle for the SB direction was 26.3 seconds, while the maximum delay was 146.1 seconds (with an average delay of 105.6 seconds). With 95 percent confidence, one could say that the total delay per vehicle would fall between 96.3 and 114.9 seconds for the southbound direction of Pennsylvania Ave and JFK. Compared to the existing, the total delay per vehicle would be between 74.9 and 84.8 seconds with 95 percent confidence. Since there is no overlap between the two intervals, the change in the total delay per vehicle 5 years from now would be significant.

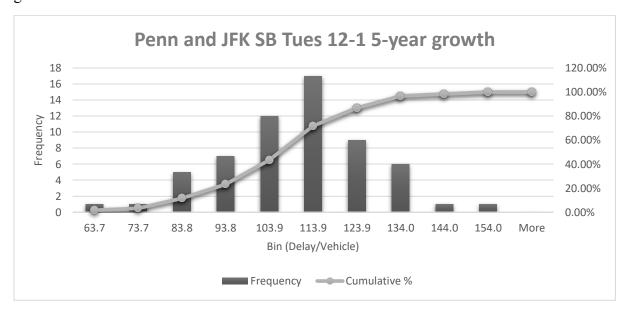


Figure 19. The total delay/vehicle the Penn and JFK intersection going southbound experienced during the 60 simulation runs from 12PM-1PM on a Tuesday with a 5-year population growth.

Using volumes from Tuesday, the team found that 70 percent of the 60 simulation runs resulted in a total delay per vehicle (southbound traffic) of 113.9 seconds or less. The minimum delay per vehicle for the SB direction was found to be 63.7 seconds, while the maximum delay was 144 seconds (with an average delay of 105.3 seconds). With 95 percent confidence, one could say that the total delay per vehicle, in the southbound direction, would fall between 101 and 109.6 seconds. Comparing that to the existing, the total delay per vehicle would be between 62.5 and 79.5 seconds with 95 percent confidence. Since there is no overlap between the two intervals, the change in the total delay per vehicle 5 years from now would be significant.

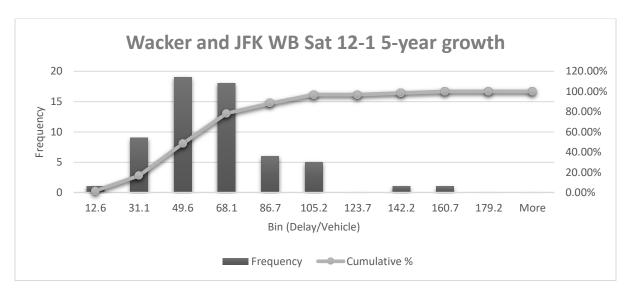


Figure 20. The total delay/vehicle the Wacker and JFK intersection going westbound experienced during the 60 simulation runs from 12PM-1PM on a Saturday with a 5-year population growth.

Traffic forecasting was also done for westbound traffic at the Wacker Dr and JFK intersection, with a 1% population growth rate to simulate conditions 5 years from now. Using the extrapolated volumes from Saturday (February 10th, 2024) the team found that 70 percent of simulation runs resulted in a total delay per vehicle of 68.1 seconds or less, for westbound traffic. The minimum delay per vehicle for the WB direction was 12.6 seconds, while the maximum delay was 160.7 seconds (with an average delay of 53.9 seconds). With 95 percent confidence, one could say that the total delay per vehicle (experienced by westbound traffic) would fall between 47 and 60.9 seconds. Compared to the existing, the total delay per vehicle was found to be in between 45.3 and 62 seconds with 95 percent confidence. Since there is an overlap between the two intervals, the change in the total delay per vehicle 5 years from now would not be significant.

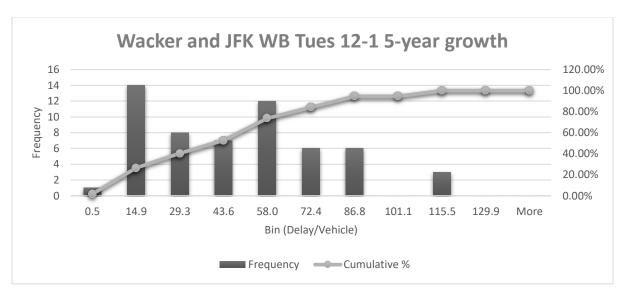


Figure 21. The total delay/vehicle the Wacker and JFK intersection going westbound experienced during the 60 simulation runs from 12PM-1PM on a Tuesday with a 5-year population growth.

Using extrapolated volumes from Tuesday (February 6th, 2024) the team found that 70 percent of simulation runs (of westbound traffic at Wacker Dr and JFK) resulted in a total delay per vehicle of 58 seconds or less. The minimum delay per vehicle for the WB direction was 0.5 seconds, while the max delay was 115.5 seconds (with an average delay of 41.1 seconds). With 95 percent confidence, one could say that the total delay per westbound vehicle would fall between 33.4 and 48.7 seconds. Comparing that to the existing, the total delay per vehicle was found to be in between 27.6 and 42 seconds with 95 percent confidence. Since there is an overlap between the two intervals, the change in the total delay per vehicle 5 years from now would not be significant.

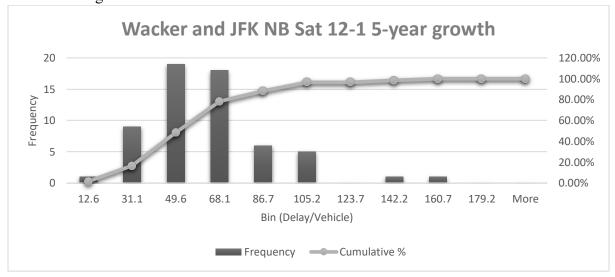


Figure 22. The total delay/vehicle the Wacker and JFK intersection going northbound experienced during the 60 simulation runs from 12-1 on a Saturday with a 5-year population growth.

The last direction analyzed by the team at Wacker Dr and JFK for a 5-year traffic forecast was the northbound direction. Using extrapolated volumes from Saturday (February 10th, 2024) the team found that 70 percent of the 60 simulation runs resulted in a total delay per northbound vehicle of 68.1 seconds or less. The minimum delay per vehicle for the NB direction was 12.6 seconds, while the maximum delay was 160.7 seconds, with an average delay of 53.9 seconds. With 95 percent confidence, one could say that the total delay per northbound vehicle (at Wacker Dr and JFK) would fall between 47 and 60.9 seconds. Comparing that to the existing, the total delay per vehicle was found to be in between 25.9 and 31 seconds with 95 percent confidence. Since there is no overlap between the two intervals, the change in the total delay per vehicle 5 years from now would be significant.

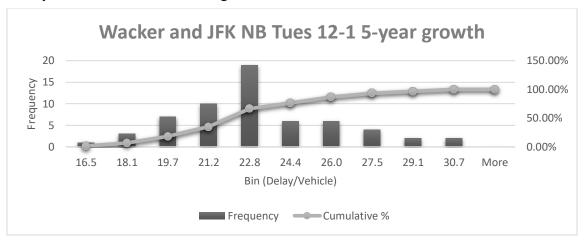


Figure 23. The total delay/vehicle the Wacker and JFK intersection going northbound experienced during the 60 simulation runs from 12PM-1PM on a Tuesday with a 5-year population growth.

Using extrapolated volumes from Tuesday, February 6th, 2024, 70 percent of simulation runs resulted in a total delay per northbound vehicle of 22.8 seconds or less. The minimum delay per vehicle for the NB direction was 16.5 seconds, while the maximum delay was 29.1 seconds (with an average delay of 22.2 seconds). With 95 percent confidence, one could say that the total delay per vehicle would fall between 21.5 and 23 seconds for the northbound direction of Wacker Dr and JFK. Comparing that to the existing, the total delay per vehicle was found to be in between 24.3 and 27 seconds with 95 percent confidence. Since there is overlap between the two intervals, the change in the total delay per vehicle 5 years from now would not be significant.

The team is using a 1% population growth rate for the city of Dubuque to forecast the future traffic volumes that would occur at each intersection from University Ave and JFK to Carter Rd and JFK. The impact of traffic is being analyzed for 5, 10, and 20 years from now. At the Pennsylvania Ave and JFK intersection.

Impact Assessment

The most common cause of crashes at the intersection of Wacker Dr and JFK Rd was improper or erratic lane changing. To improve clarity for drivers, the team recommends repainting all intersection markings, especially that of the left-hand turn from Wacker Dr onto

JFK (going NB). When the team visited the intersection the left-hand turn striping had been completely worn off, essentially leaving the width of the turn up to driver's discretion. Since snow plowing and the application of sand/salt wears the markings down quickly, the team recommends the city consider including reflective turn striping on the turn (possibly installed in divets).

Comparing the results of the two alternatives (the three-way stop with and without the pedestrian median), there was a significant drop in delays on Carter (because people going westbound on Carter instead of waiting for the left will be taking the right. That said, installing the pedestrian median does lead to a slight increase in delay at the Pennsylvania Ave and JFK intersection due to the fact that vehicles traveling southbound on JFK will not be able to take a left onto Carter. Shown in red is the route likely to be used by vehicles coming from the north (as you can see there will be an increase in volume of vehicles traveling on Hillcrest Rd). Shown in green and yellow are the routes most likely to be used by vehicles from the south dropping kids off at school (with the yellow area representing the area most kids will be dropped off at). As you can see there will be an increase in traffic on residential streets especially Churchill Dr.



Figure 24. Aerial view of the routes likely to be taken by parents dropping children off at school if the pedestrian median at Carter Rd. and JFK Rd is constructed.

Mitigation Measures:

As a result of the increased volume of traffic on the residential roads, further analysis will need to be done to identify if the roads can handle the increased volume. A trial run of the pedestrian median using flexible delineators or barriers can be used to test the effectiveness of the design as well as the driver's response to the changes.

Section V: Alternative Solutions to be Considered

One of the main alternatives our team is proposing is adding a 3-way stop at Carter Rd and Ridge Rd. Additionally, another alternative our team is proposing is adding a pedestrian median on Carter Rd and JFK while also incorporating a 3-way stop on Carter Rd and Ridge Rd. While adding the three-way stop at Carter Rd and Ridge Rd may be the cheaper option, our team recommends constructing a pedestrian median at the Carter Rd and JFK intersection, while also incorporating the 3-way stop at Carter Rd and Ridge Rd. The affect this option would have at the intersection is that it would cause there to be a right-in and right-out only into and out of Carter Rd from JFK. This option is also more expensive and will be more impactful on the flow of traffic, however it addresses the issue of pedestrians trying to cross JFK.

3-WAY STOP Tables: 68

General and Site Informat	ion				Lanes							
Analyst	Payton	Stuart										
Agency/Co.		ity of lowa					ال	4 ↓.	7 🌵 🕈	• <u>L</u>		
Date Performed	4/25/20	-							Ļ			
Analysis Year	2024				1	_*					K _	
Analysis Time Period (hrs)	1.00					_2,					*	
Time Analyzed	2:43				1	4					←	
Project Description					1	≺				-	<u>></u>	
Intersection	Carter/i	lidge			1	4 + - + + +					7	
Jurisdiction					1	~					'y 	
East/West Street	Carter F	ld			1	•					**	
North/South Street	Ridge R	d			1		5	ሳ ቀ ነ	7 1 1			
Peak Hour Factor	0.92				1			1 1				
Turning Movement Dema	nd Volun	nes										
Approach	Т	Eastbound		П	Westboun	<u> </u>		Northboun	d		Southboun	d
Movement	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Volume (veh/h)	7	51			96	29				12		24
% Thrus in Shared Lane												
Lane Flow Rate and Adjust	tments											
Approach	Т	Eastbound	1	Г	Westboun	<u> </u>		Northboun	d		Southboun	d
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR						LR		
Flow Rate, v (veh/h)	63			136						39		
Percent Heavy Vehicles	2			2						2		
Initial Departure Headway, ha (s)	3.20			3.20						3.20		
Initial Degree of Utilization, x	0.056			0.121						0.035		
Final Departure Headway, hd (s)	4.17			3.94						4.02		
Final Degree of Utilization, x	0.073			0.149						0.044		
Move-Up Time, m (s)	2.0			2.0						2.0		
Service Time, t _s (s)	2.17			1.94						2.02		
Capacity, Delay and Level	of Servic	e										
Approach	Т	Eastbound	1		Westboun	i		Northboun	d		outhboun	d
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	LI	L2	L3
Configuration	LT			TR						LR		
Flow Rate, v (veh/h)	63			136						39		
Capacity (veh/h)	864			914						897		
95% Queue Length, Q ₅₅ (veh)	0.2			0.5						0.1		
95% Queue Length, Q ₅₅ (ft)	5.1			12.7						2.5		
Control Delay (s/veh)	7.5			7.6						7.2		
Level of Service, LOS	A			Α						Α		
Approach Delay (s/veh) LOS	7.5		Α	7.6		Α				7.2		Α
Intersection Delay (s/veh) LOS			-	.5						A		

Table 38. All-Way Stop at Carter and Ridge Existing

Intersection, positioned east of the Carter and JFK intersection. It's clear that even with this proposed alteration, the intersection maintains its efficiency, mirroring its current functionality with only the stop sign at Ridge. Our main aim was to gauge whether the eastbound direction would encounter significant delays due to vehicles entering Carter from JFK. However, the data indicates that this addition does not hinder the intersection's performance. This trend

persists across all projected conditions spanning 5 years, 10 years, and 20 years. There's minimal variance in control and approach delays among all conditions, while the Level of Service (LOS) remains consistently rated as A. As shown in the tables below.

The table above depicts the introduction of an all-way stop at the Carter and Ridge

Table 39. All-Way Stop at Carter and Ridge 5-yr projection

		HCS	All-W	ay Sto	p Con	trol Re	eport					
General and Site Informati	on				Lanes							
Analyst	Payton :	Stuart										
Agency/Co.	_	ty of lowa					ل	4 1.	747	٠ لـ		
Date Performed	4/25/20	24							Ļ			
Analysis Year	2024				1	_*					~	
Analysis Time Period (hrs)	1.00				1	.4 + - - - →					7	
Time Analyzed	2:43				1	÷					<u> </u>	
Project Description					1	- ₹) <u>-</u>	
Intersection	Carter/F	lidge			1						7	
Jurisdiction					1	~					<u>~</u>	
East/West Street	Carter R	d			1	-						
North/South Street	Ridge R	d			1		1000	ሳ ቀ ነ	y* + 1x	. 7		
Peak Hour Factor	0.92				1			1 1				
Turning Movement Demar	nd Volum	ies										
Approach		Eastbound			Westbound	i		Northboun	d	!	Southboun	d
Movement	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Volume (veh/h)	8	54			118	30				13		25
% Thrus in Shared Lane												
Lane Flow Rate and Adjust	ments											
Approach	$\overline{}$	Eastbound	ı		Westbound	<u> </u>		Northboun	d		Southboun	d
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR						LR		
Flow Rate, v (veh/h)	67			161						41		
Percent Heavy Vehicles	2			2						2		
Initial Departure Headway, ha (s)	3.20			3.20						3.20		
Initial Degree of Utilization, x	0.060			0.143						0.037		
Final Departure Headway, hd (s)	4.20			3.97						4.09		
Final Degree of Utilization, x	0.079			0.177						0.047		
Move-Up Time, m (s)	2.0			2.0						2.0		
Service Time, t _i (s)	2.20			1.97						2.09		
Capacity, Delay and Level	of Servic	e										
Approach	Т	Eastbound			Westbound	<u> </u>		Northboun	d	!	Southboun	d
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR						LR		
Flow Rate, v (veh/h)	67			161						41		
Capacity (veh/h)	857			907						881		
95% Queue Length, Q ₉₈ (veh)	0.3			0.6						0.1		
95% Queue Length, Q ₉₀ (ft)	7.6			15.2						2.5		
Control Delay (s/veh)	7.6			7.8						7.3		
Level of Service, LOS	A			Α						Α		
Approach Delay (s/veh) LOS	7.6		Α	7.8		Α				7.3		Α
Intersection Delay (s/veh) LOS			7	.7						A		

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HCS™ AWSC Version 2024 Carte_Ridge_5yr_12pm_Sat AWSC.xaw Generated: 5/6/2024 10:34:20 AM

Table 40. All-Way Stop at Carter and Ridge 10-yr projection

		HCS	All-W	ay Sto	p Con	trol Re	eport					
General and Site Informati	on				Lanes							
Analyst	Payton :	Stuart										
Agency/Co.	Universi	ty of lowa					1		/ 🌵 🏲	<u>.</u>		
Date Performed	4/25/20	24							Ļ.			
Analysis Year	2024					_*					* _	
Analysis Time Period (hrs)	1.00					1 4 4 ↑ ↑					*	
Time Analyzed	2:43					*					<u> </u>	
Project Description						۲,					← }- \$-	
Intersection	Carter/F	lidge									7	
Jurisdiction						×					<u>~</u>	
East/West Street	Carter R	d				•						
North/South Street	Ridge R	d					100 mg	भी भी <i>र</i> भ	7 † †			
Peak Hour Factor	0.92							1 1				
Turning Movement Deman	d Volum	ies										
Approach	T	Eastbound	ı		Westbound	i	1	Northboun	d	2	outhboun	d
Movement	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Volume (veh/h)	8	57			106	32				13		27
% Thrus in Shared Lane	1											
Lane Flow Rate and Adjust	ments											
Approach	T	Eastbound	ı		Westbound	i	1	Northboun	d	2	outhboun	d
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR						LR		
Flow Rate, v (veh/h)	71			150						43		
Percent Heavy Vehicles	2			2						2		
Initial Departure Headway, ha (s)	3.20			3.20						3.20		
Initial Degree of Utilization, x	0.063			0.133						0.039		
Final Departure Headway, hd (s)	4.19			3.96						4.06		
Final Degree of Utilization, x	0.082			0.165						0.049		
Move-Up Time, m (s)	2.0			2.0						2.0		
Service Time, t ₁ (s)	2.19			1.96						2.06		
Capacity, Delay and Level o	f Servic	e										
Approach	Τ	Eastbound			Westbound	i	1	Northboun	d	2	outhboun	d
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR						LR		
Flow Rate, v (veh/h)	71			150						43		
Capacity (veh/h)	859			910						888		
95% Queue Length, Q ₉₅ (veh)	0.3			0.6						0.2		
95% Queue Length, Q ₉₅ (ft)	7.6			15.2						5.1		
Control Delay (s/veh)	7.6			7.7						7.3		
Level of Service, LOS	А			Α						Α		
Approach Delay (s/veh) LOS	7.6		Α	7.7		Α				7.3		Α
Intersection Delay (s/veh) LOS			7	7.6					-	4		

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HCS[™] AWSC Version 2024 Carte_Ridge_10yr_12pm_Sat AWSC.xaw

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Table 41. All-Way Stop at Carter and Ridge 20-yr projection

		HCS	All-W	ay Sto	p Con	trol Re	eport					
General and Site Information	n				Lanes							
Analyst	Payton S	Stuart										
Agency/Co.	Universi	ty of lowa					ل	4 1 .	7 4 7	٠ <u>ل</u> ـ		
Date Performed	4/25/20	24							Ļ			
Analysis Year	2024					_*					* —	
Analysis Time Period (hrs)	1.00					4					*	
Time Analyzed	2:43					*					<u> </u>	
Project Description						- - - - - -					<u>}_</u>	
Intersection	Carter/R	lidge									7	
Jurisdiction						→					γ -	
East/West Street	Carter R	d				4					••	
North/South Street	Ridge R	d						ሳ ቀ	21 A B			
Peak Hour Factor	0.92							1 1				
Turning Movement Deman	d Volum	es										
Approach	Т	Eastbound			Westbound	:		Northboun	d	-	Southboun	d
Movement	L	T	R	L	T	R	L	Т	R	L	Т	R
Volume (veh/h)	9	63			117	35				15		29
% Thrus in Shared Lane												
Lane Flow Rate and Adjustr	nents											
Approach		Eastbound			Westbound	1		Northboun	d	9	Southboun	d
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR						LR		
Flow Rate, v (veh/h)	78			165						48		
Percent Heavy Vehicles	2			2						2		
Initial Departure Headway, ha (s)	3.20			3.20						3.20		
Initial Degree of Utilization, x	0.070			0.147						0.043		
Final Departure Headway, hd (s)	4.22			3.98						4.12		
Final Degree of Utilization, x	0.092			0.183						0.055		
Move-Up Time, m (s)	2.0			2.0						2.0		
Service Time, t _s (s)	2.22			1.98						2.12		
Capacity, Delay and Level o	f Servic	e										
Approach		Eastbound			Westbound	d		Northboun	d		Southboun	d
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR						LR		
Flow Rate, v (veh/h)	78			165						48		
Capacity (veh/h)	854			905						875		
95% Queue Length, Q ₅₅ (veh)	0.3			0.7						0.2		
95% Queue Length, Q ₅₆ (ft)	7.6			17.8						5.1		
Control Delay (s/veh)	7.6			7.9						7.4		
Level of Service, LOS	Α			Α						Α		
Approach Delay (s/veh) LOS	7.6		Α	7.9		Α				7.4		Α

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3-WAY STOP GRAPHS:

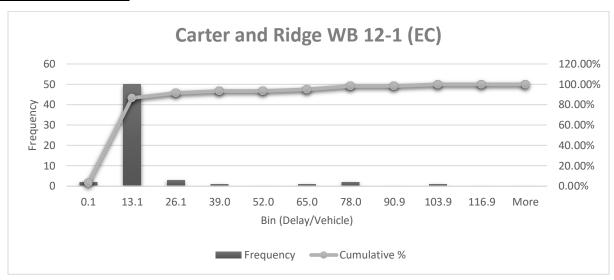


Figure 17. The total delay/vehicle the Carter and Ridge intersection going westbound experienced during the 60 simulation runs from 12PM-1PM on a Saturday.

Out of the 60 simulations ran simulating the existing conditions at Carter and Ridge Rd (on Saturday from 12-1), 90 percent resulted in a total delay per westbound vehicle of approximately 13.1 seconds or less.

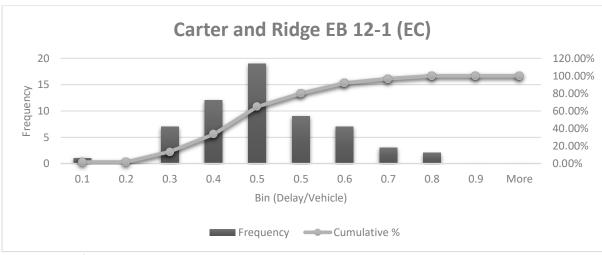


Figure 18. The total delay/vehicle the Carter and Ridge intersection going eastbound experienced during the 60 simulation runs from 12PM-1PM on a Saturday.

Out of the 60 simulations ran simulating the existing conditions at Carter and Ridge Rd (on Saturday from 12-1), 90 percent resulted in a total delay per eastbound vehicle of approximately .6 seconds or less.

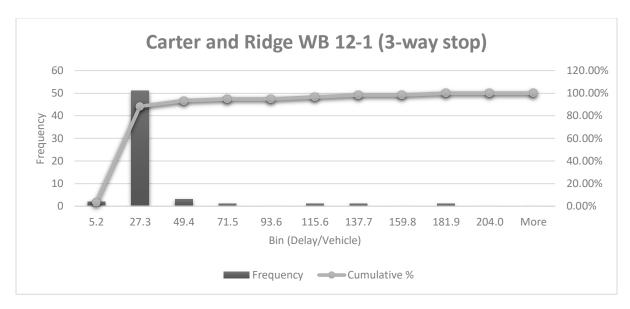


Figure 19. The total delay/vehicle the Carter and Ridge intersection with a 3-way stop going westbound experienced during the 60 simulation runs from 12pm-1 pm on a Saturday.

Out of the 60 simulations ran, simulating the conditions at Carter and Ridge Rd (if a 3-way stop was implemented) 90 percent resulted in a total delay per westbound vehicle of approximately 27.3 seconds or less.

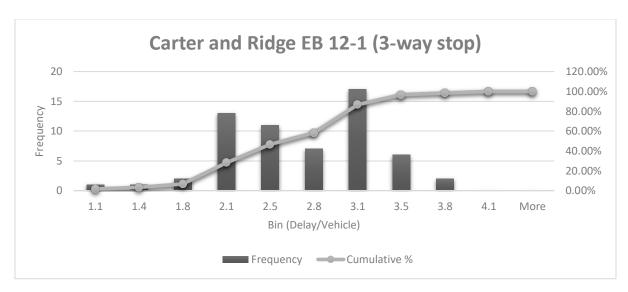


Figure 20. The total delay/vehicle the Carter and Ridge intersection with a 3-way stop going eastbound experienced during the 60 simulation runs from 12PM-1PM on a Saturday.

Out of the 60 simulations ran, simulating the conditions at Carter and Ridge Rd (if a 3-way stop was implemented) 90 percent resulted in a total delay per eastbound vehicle of approximately 3.1 seconds or less.

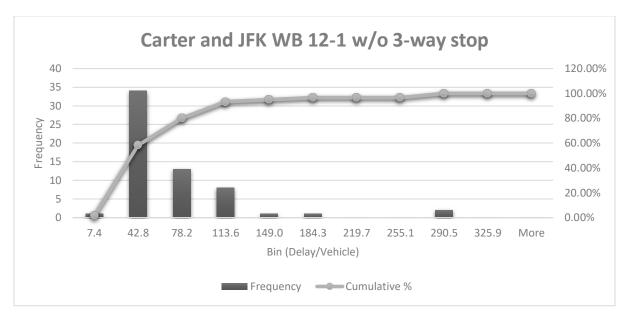


Figure 21. The total delay/vehicle the Carter and JFK intersection without a 3-way stop going westbound experienced during the 60 simulation runs from 12PM-1PM on a Saturday.

Of the 60 simulations ran at Carter Rd and JFK without a 3-way stop, around 80 percent resulted in a total delay per vehicle of 78.2 seconds or less going westbound. The minimum delay per vehicle for the westbound direction was 7.4 seconds, while the maximum delay was 290.5 seconds (with an average delay of 53.9 seconds). With 95 percent confidence, one could say that the total delay per vehicle would fall between 40.2 and 67.5 seconds for the westbound direction of Carter Rd and JFK.

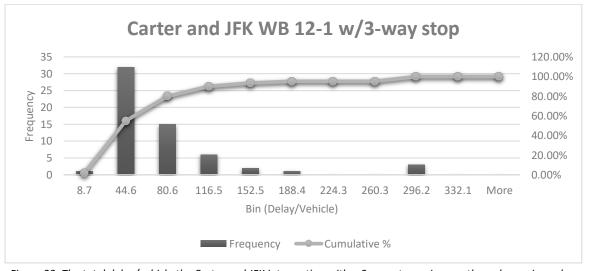


Figure 22. The total delay/vehicle the Carter and JFK intersection with a 3-way stop going westbound experienced during the 60 simulation runs from 12PM-1PM on a Saturday.

Of the 60 simulations ran at Carter Rd and JFK with a 3-way stop, around 80 percent resulted in a total delay per vehicle of 116.5 seconds or less going westbound. The minimum delay per vehicle for the westbound direction was 8.7 seconds, while the maximum delay was 296.2 seconds (with an average delay of 61.4 seconds). With 95 percent confidence, one could say that the total delay per vehicle would fall between 45.5 and 77.3 seconds for the westbound direction of Carter Rd and JFK.

Pedestrian-Median GRAPHS:

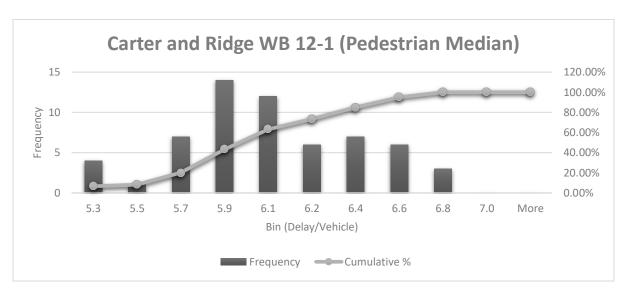


Figure 23. The total delay/vehicle the Carter and Ridge intersection with a pedestrian median going westbound experienced during the 60 simulation runs from 12-1PM on a Saturday.

Of the 60 simulations ran at Carter Rd and Ridge Rd with a pedestrian median, around 80 percent resulted in a total delay per vehicle of 6.4 seconds or less going westbound. The minimum delay per vehicle for the westbound direction was 5.3 seconds, while the maximum delay was 6.8 seconds (with an average delay of 6 seconds). With 95 percent confidence, one could say that the total delay per vehicle would fall between 5.9 and 6.1 seconds for the westbound direction of Carter Rd and JFK with a pedestrian median.

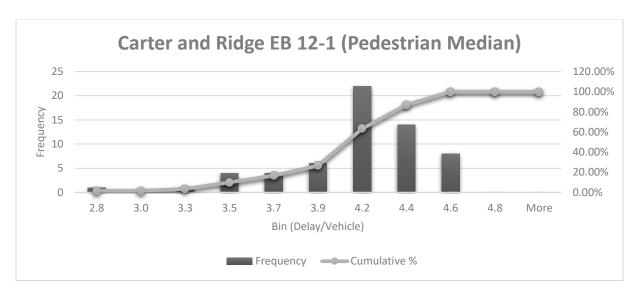


Figure 24. The total delay/vehicle the Carter and Ridge intersection with a pedestrian median going eastbound experienced during the 60 simulation runs from 12-1 PM on a Saturday.

Of the 60 simulations ran at Carter Rd and Ridge Rd with a pedestrian median, around 80 percent resulted in a total delay per vehicle of 4.4 seconds or less going eastbound. The minimum delay per vehicle for the eastbound direction was 2.8 seconds, while the maximum delay was 4.6 seconds (with an average delay of 4 seconds). With 95 percent confidence, one could say that the total delay per vehicle would fall between 3.9 and 4.1 seconds for the eastbound direction of Carter Rd and Ridge Rd with a pedestrian median.

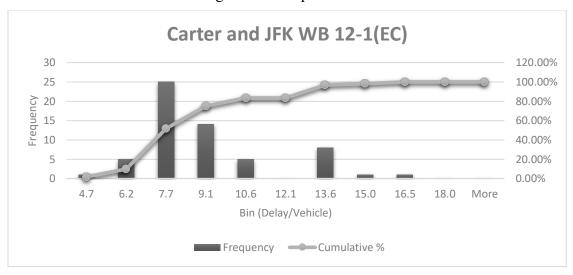


Figure 25. The total delay/vehicle the Carter and JFK intersection with a pedestrian median going westbound experienced during the 60 simulation runs from 12-1PM on a Saturday.

Of the 60 simulations ran at Carter Rd and JFK with a pedestrian median, around 80 percent resulted in a total delay per vehicle of 12.1 seconds or less going westbound. The minimum delay per vehicle for the westbound direction was 4.7 seconds, while the maximum

delay was 16.5 seconds (with an average delay of 8.4 seconds). With 95 percent confidence, one could say that the total delay per vehicle would fall between 7.7 and 9 seconds for the westbound direction of Carter Rd and JFK with a pedestrian median.

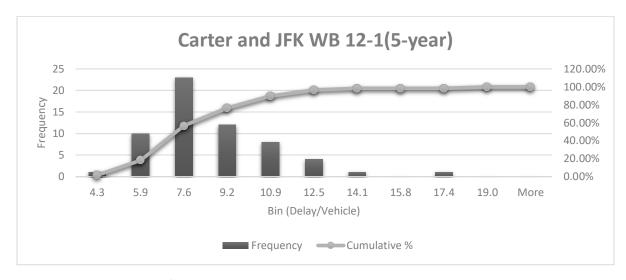


Figure 26. The total delay/vehicle the Carter and JFK intersection with a pedestrian median going westbound experiences 5 years from now during the 60 simulation runs from 12-1PM on a Saturday.

Of the 60 simulations ran at Carter Rd and JFK with a pedestrian median for a 5-year projected traffic forecast, around 80 percent resulted in a total delay per vehicle of 9.2 seconds or less going westbound. The minimum delay per vehicle for the westbound direction was 4.3 seconds, while the maximum delay was 17.4 seconds (with an average delay of 7.9 seconds). With 95 percent confidence, one could say that the total delay per vehicle would fall between 7.2 and 8.5 seconds for the westbound direction of Carter Rd and JFK with a pedestrian median.

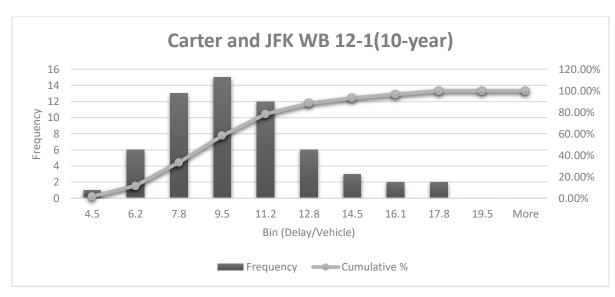


Figure 27. The total delay/vehicle the Carter and JFK intersection with a pedestrian median going westbound experiences 10 years from now during the 60 simula on runs from 12-1PM on a Saturday.

Of the 60 simulations ran at Carter Rd and JFK with a pedestrian median for a 10-year projected traffic forecast, around 80 percent resulted in a total delay per vehicle of 11.2 seconds or less going westbound. The minimum delay per vehicle for the westbound direction was 4.5 seconds, while the maximum delay was 17.8 seconds (with an average delay of 9.3 seconds). With 95 percent confidence, one could say that the total delay per vehicle would fall between 8.6 and 10.1 seconds for the westbound direction of Carter Rd and JFK with a pedestrian median.

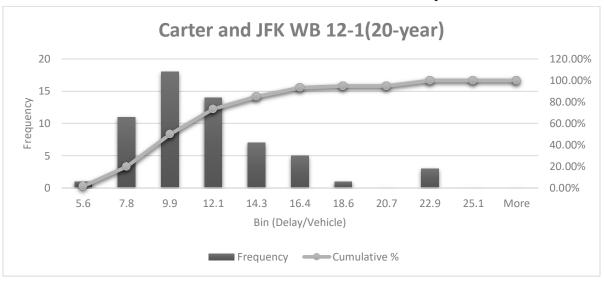


Figure 28. The total delay/vehicle the Carter and JFK intersection with a pedestrian median going westbound experiences 20 years from now during the 60 simulation runs from 12-1PM on a Saturday.

Of the 60 simulations ran at Carter Rd and JFK with a pedestrian median for a 20-year projected traffic forecast, around 80 percent resulted in a total delay per vehicle of 14.3 seconds or less going westbound. The minimum delay per vehicle for the westbound direction was 5.6 seconds, while the maximum delay was 22.9 seconds (with an average delay of 10.6 seconds). With 95 percent confidence, one could say that the total delay per vehicle would fall between 5.6 and 22.9 seconds for the westbound direction of Carter Rd and JFK with a pedestrian median.

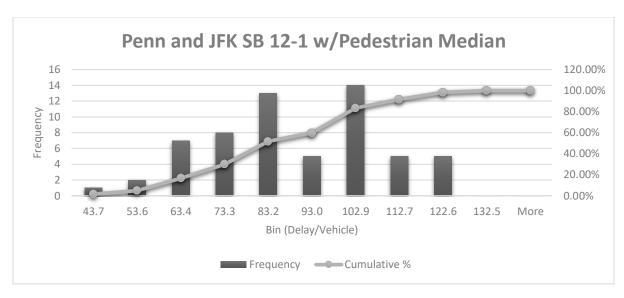


Figure 29. The total delay/vehicle the Pennsylvania and JFK intersection with a pedestrian median going southbound experienced during the 60 simulation runs from 12-1PM on a Saturday.

Of the 60 simulations run at Pennsylvania Ave and JFK with a pedestrian median, around 80 percent resulted in a total delay per vehicle of 102.9 seconds or less going southbound. The minimum delay per vehicle for the southbound direction was 43.7 seconds, while the maximum delay was 122.6 seconds (with an average delay of 84.8 seconds). With 95 percent confidence, one could say that the total delay per vehicle would fall between 79.8 and 89.9 seconds for the southbound direction of Pennsylvania Ave and JFK with a pedestrian median.

Section VI: Final Design Details

In the final design, the team recommends adding a sidewalk along the west side of JFK starting on the south side of Stoneman Rd down to the Wacker Dr and Kennedy Mall intersection. The team also recommends the reconstruction of the section of sidewalk adjacent to the Sunshine Family Restaurant.

Additionally, the team recommends adding crosswalk markings across the Kennedy mall entrance and Wacker Dr while also updating the crosswalk markings across JFK as seen in Figure 41. The group also proposes adding pedestrian pushbuttons at Wacker Dr and JFK also denoted by Figure 41.

The group also advises constructing a pedestrian median at the Carter Rd and JFK intersection and including flexible delineators on the sides of the sidewalk to help aid the safety of pedestrians. The flexible delineators will also make the cars less inclined to drive near the median. These delineators will be placed on the perimeter of the sidewalk as seen in Figure 42. Moreover, the group advises making the Carter Rd and Ridge Rd intersection a 3-way stop.

Finally, the team recommends implementing adjusted signal timing to reduce overall delay at both major signalized intersections at the southern portion of the John F Kennedy Rd corridor.



Figure 30. Proposed Sidewalk Reconstruction

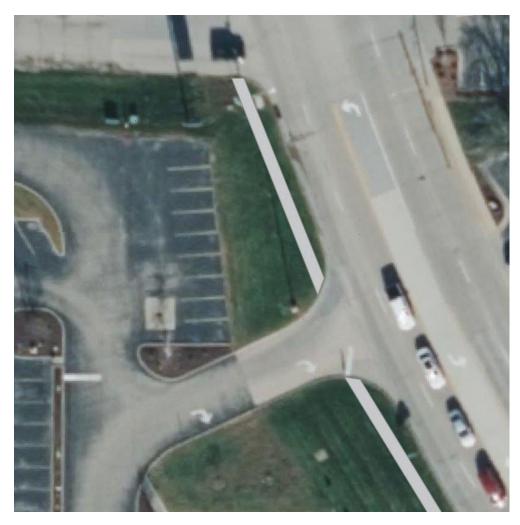


Figure 31. New Sidewalk South of Stoneman Rd

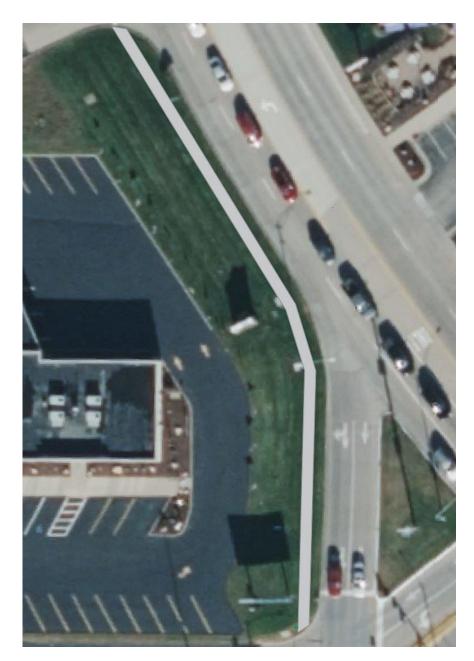


Figure 32. New Sidewalk Between Stoneman Rd and Wacker Dr



Figure 33. New Sidewalk at Wacker Dr Intersection



Figure 34. Proposed Pedestrian Median at Carter Rd and JFK



Figure 35. Ideal placement of the flexible delineators on the pedestrian median as denoted by a star.

Section VII: Engineer's Cost Estimate

The cost estimate was split into two sections. One for the sidewalk improvements and another for the pedestrian median. The sidewalk improvements include both the removal of the existing sidewalk next to the Sunshine Family Restaurant as well as the cost to replace it and add the new sidewalk. Also included is the estimated cost of the right of way acquisition for the new sidewalk, crosswalk pavement markings and pedestrian signs. The cost estimate for the pedestrian median includes the concrete, pavers, metal detectable warnings, flexible delineators, and stop signs. The total cost for both comes out to be \$107,609.24. Adding an additional 20% contingency brings the total cost to \$129,131.08.

Table 42. Budget Summary

Sidewalk Cost Estimat	e			
Item	Quantity	Unit	Unit Price	Total
Removal of sidewalk	194.90	SY	35	\$ 6,821.50
Sidewalk PCC, 4"	443.57	SY	125	\$ 55,446.0
Right of way Acquisition	1629.06	SF	3.89	\$ 6,337.04
Crosswalk pavement markings	114	LF	1.27	\$ 144.78
Pedestrian crosswalk signs	3	EACH	45.9	\$ 137.70
Push button with sign and post	t 2	EACH	4715	\$ 9,430.00
Sub-Total				\$ 78,317.01
Pedestrian Median Co	st Estimate			
Item	Quantity	Unit	Unit Price	Total
Brick Pavers	141.86	SF	11.09	\$ 1,573.23
PCC	162.52	SY	125	\$ 20,315.6
Detectable Warnings	20	EACH	162	\$ 3,240.00
Top Soil 6"	656.8	SF	5.58	\$ 3,664.94
Stop Signs 24" Octagon	2	EACH	34.25	\$ 68.50
Flexible Delineators	10	EACH	43	\$ 430.00
Sub-Total				\$ 29,292.23
Total w/o	Contingency			\$107,609.24
20% Conti	ingency			\$ 21,521.85
Total				\$129,131.08

Section VIII: Conclusions



Figure 36. Key points of concern along the John F Kennedy Rd Corridor.

The three main points of concern along the John F. Kennedy corridor are shown above. To improve pedestrian safety the team increased sidewalk connectivity and included additional crosswalks in areas of need. The team proposes construction of a pedestrian median at the intersection of Carter Rd and JFK. Moreover, the team recommends the installation of pedestrian pushbuttons at the intersection of Wacker Dr. and JFK to encourage freedom of pedestrian mobility and promote intersection safety. Additionally, the team recommends repainting intersection markings at both major intersections, especially that of the left hand turn from Wacker Dr. onto JFK (going northbound). Finally, the team recommends implementing adjusted signal timing to minimize overall delay at both major intersections.

Section X: References

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Organization Qualifications and Experience

The team completing this report was comprised of University of Iowa students enrolled in the capstone design class in Civil & Environmental Engineering. They combined diverse expertise to tackle projects effectively. Connor Bobay specialized in the structural CEE program; John Lyons focusds on civil practic; Tony Pezzella and Payton Stuart specialized in transportation CEE . Payton Stuart served as the project manager, overseeing the operational traffic study and implementation. Tony Pezzella was the tech support manager, managing geometric enhancements. Connor Bobay and John Lyons served as editors, overseeing structural elements and support geometric and operational implementations.

Experience: Payton Stuart interned at a Cedar Rapids consulting firm, where he split his time between roadway design using Bentley's MicroStation and managing the city of Cedar Rapids sidewalk program. John Lyons gained experience with the Walsh Group, where he interned as part of the track team on the CTA Red Line project and worked in the transportation estimation department. Tony Pezzella interned at WSP, contributing to demolition cost estimation, Bentley product utilization for pavement patching and station labeling, and road/sidewalk inspection. Currently, Tony is enrolled in a class that utilizes the traffic software "Synchro". Connor Bobay interned for the City of Cedar Rapids Public Works Department, collaborating with city inspectors, and overseeing various construction projects, including road reconstruction and sidewalk installation.

Constraints, Challenges, and Impacts

The project is limited to the evaluation of JFK in Dubuque, IA. The project's initial period of performance goes from 2/5/2024 to 5/3/2024. The section of JFK the project is focused on stretches from HWY 20 to Carter Rd. There is a limited number of camera angles at the JFK and Wacker Dr intersection. At the JFK and minor street intersections, no traffic cameras are available to count the turning movements. These intersections include JFK and University Ave, Daykin Ct, Stoneman Rd, Crestwood Dr, and Carter Rd. The improvement of the intersections is also limited to the property boundaries where one could expand the roadway or potentially add sidewalks. Some parts of the corridor have more space to work with than other parts where intruding into other properties would be an issue and a challenge to improve the area.

A major challenge of the project is to develop a solution that is cost-effective, while having a positive societal impact on residents. Ensuring community assets such as the elementary schools, churches, and the fire station are positively impacted is paramount. Accurately analyzing traffic flow through an intersection became more of a challenge with limited camera angles at Wacker and JFK. The team responded by utilizing Iowa Department of Transportation data to predict the quantity of vehicles taking a right off JFK, onto Wacker Dr. Another challenge of the project is helping the highway capacity software to correctly analyze flow. The non-traditional intersection at Wacker and JFK created software issues.

Another constraint is the limited ability to create a precise report of the minor street intersections with JFK. As the HCS software is incapable of doing a one-way stop control analysis. In turn a challenge involving the minor street intersections is the lack of volume in Crestwood Dr. creating a proximate report of what is occurring at the Crestwood and JFK intersection. Also, the Excel sheet cannot correctly estimate the University Ave. turning movements, making the team use the AADT data from the Iowa DOT.

Adding a sidewalk along JFK from Stoneman Rd through Wacker Dr could have a positive societal impact on the Dubuque community. The sidewalks would provide easier access for pedestrians to navigate the neighborhood while increasing safety. The addition of sidewalks would also encourage more people to walk or bike to their destination instead of driving. This in turn could also cause there to be less traffic on the roadway, which could improve the delay and level of service at some of the intersections where it is a problem. Changes involving the signal timing of corridor intersections could improve efficiency, allowing residents of Dubuque to arrive at their destination quicker. Consequently, residents may go through the corridor more frequently, feeling that the route is more reliable. This could increase the number of cars going through this section of roadway, which is good for businesses. Further examination is recommended to address these discrepancies and ensure accurate modeling of traffic conditions in this area.

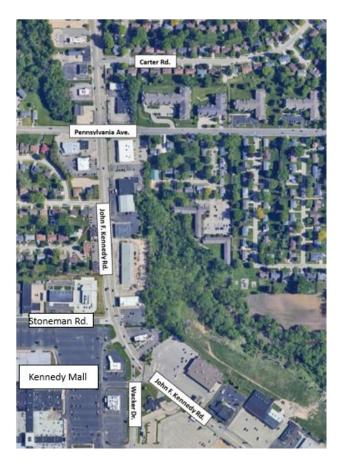


Figure 1. Aerial view displaying the southern portion of the JFK Corridor



Figure 2. Aerial View of Dubuque, IA with JFK Rd highlighted.

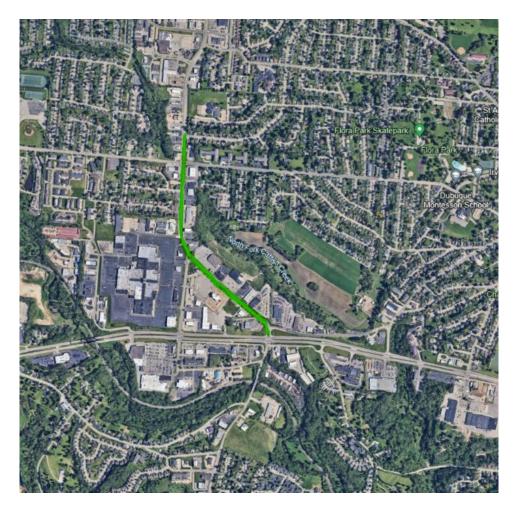


Figure 3. Aerial view of the section of JFK Rd the project is focused on.

The Gantt chart (Figure 4) presented below provides a visual representation of the allocation of time dedicated to each of the project's tasks. Each bar on the chart corresponds to a specific task, and the length of each bar illustrates the amount of time dedicated to completing that task. As Figure 45 shows, the most time-consuming project task was the evaluation of existing roadway conditions (using Highway Capacity and Synchro software).



Figure 4. Gantt Chart of Project Schedule

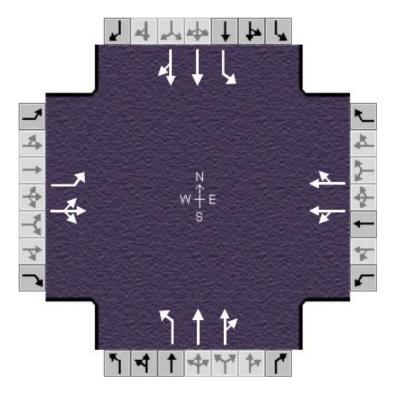


Figure 14. Existing intersection geometry of Wacker Dr and JFK Rd

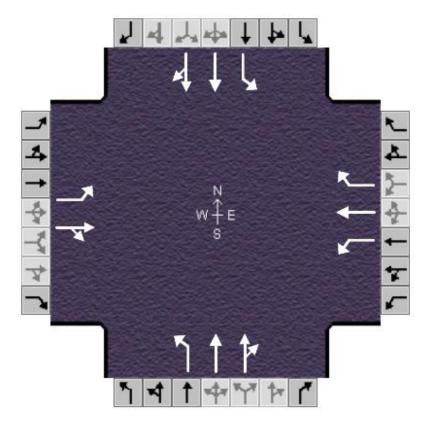


Figure 15. Existing intersection geometry of Pennsylvania Ave and JFK Rd

Table 43. Carter Rd and JFK Rd Two-Way Stop HCS Control Report

		H														
General Information							Site	Inforn	natio	1						_
Analyst	Payto	n Stuart					Inters	ection			Carte	r/JFK				
Agency/Co.	Unive	rsity of l	lowa				Jurisd	liction			Dubu	que Cou	ınty			
Date Performed	2/15/	2024					East/\	West Stre	eet		Carte	r Rd				
Analysis Year	2024						North	n/South S	Street		John	F. Kenne	dy			
Time Analyzed	3:05						Peak	Hour Fac	tor		0.92					
Intersection Orientation	North	n-South					Analy	sis Time	Period (hrs)	1.00					
Project Description																
Lanes																
				1447177		† † す や Y r Street. Nor		1 4 4 Y 1								
Vehicle Volumes and Adj	ustme	nts														
Approach	\bot		ound			_	ound				bound				bound	_
Movement	U	L	Т	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	\perp	10	11	12		7	8	9	10	1	2	3	4U	4	5	6
Number of Lanes	+	0	0	0		1	0	1	0	0	2	0	0	0	2	0
Configuration	+					L		R			T	TR		LT	T	H
Volume (veh/h)	+					29		8			572	96		37	551	
Percent Heavy Vehicles (%)			l			1 1		1 1	l .				l .	1 1		
Described Time Blacked						<u> </u>										
Proportion Time Blocked							7									
Percent Grade (%)						-	7									
Percent Grade (%) Right Turn Channelized				Undi	vided	-	7									
Percent Grade (%) Right Turn Channelized Median Type Storage				Undi	vided	-										
Percent Grade (%) Right Turn Channelized Median Type Storage Critical and Follow-up H	eadwa	ys		Undi	vided	- N										
Percent Grade (%) Right Turn Channelized Median Type Storage Critical and Follow-up H Base Critical Headway (sec)	eadwa	ys		Undi	vided	7.5		6.9						4.1		
Percent Grade (%) Right Turn Channelized Median Type Storage Critical and Follow-up H Base Critical Headway (sec) Critical Headway (sec)	eadwa	ys		Undi	vided	7.5 5.42		6.22						4.12		
Percent Grade (%) Right Turn Channelized Median Type Storage Critical and Follow-up H Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec)	eadwa	ys		Undi	vided	7.5 5.42 3.5		6.22 3.3						4.12 2.2		
Percent Grade (%) Right Turn Channelized Median Type Storage Critical and Follow-up H Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec)					vided	7.5 5.42		6.22						4.12		
Percent Grade (%) Right Turn Channelized Median Type Storage Critical and Follow-up H Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec) Delay, Queue Length, an			ervice		vided	7.5 5.42 3.5 3.51		6.22 3.3 3.31						4.12 2.2 2.21		
Percent Grade (%) Right Turn Channelized Median Type Storage Critical and Follow-up H Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec) Delay, Queue Length, an Flow Rate, v (veh/h)			ervice		vided	7.5 5.42 3.5 3.51		6.22 3.3 3.31						4.12 2.2 2.21		
Percent Grade (%) Right Turn Channelized Median Type Storage Critical and Follow-up H Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec) Delay, Queue Length, an Flow Rate, v (veh/h) Capacity, c (veh/h)			ervice		vided	7.5 5.42 3.5 3.51		6.22 3.3 3.31 9 683						4.12 2.2 2.21 40 879		
Percent Grade (%) Right Turn Channelized Median Type Storage Critical and Follow-up H Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec) Delay, Queue Length, an Flow Rate, v (veh/h) Capacity, c (veh/h) v/c Ratio			ervice		vided	7.5 5.42 3.5 3.51 32 301 0.10		6.22 3.3 3.31 9 683 0.01						4.12 2.2 2.21 40 879 0.05		
Percent Grade (%) Right Turn Channelized Median Type Storage Critical and Follow-up H Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec) Delay, Queue Length, an Flow Rate, v (veh/h) Capacity, c (veh/h) v/c Ratio 95% Queue Length, Qas (veh)			ervice		vided	7.5 5.42 3.5 3.51 32 301 0.10		6.22 3.3 3.31 9 683 0.01 0.0						4.12 2.2 2.21 40 879 0.05 0.1		
Percent Grade (%) Right Turn Channelized Median Type Storage Critical and Follow-up H Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec) Delay, Queue Length, an Flow Rate, v (veh/h) Capacity, c (veh/h) v/c Ratio 95% Queue Length, Qas (veh) 95% Queue Length, Qas (ft)			ervice		vided	7.5 5.42 3.5 3.51 32 301 0.10 0.3 7.6		6.22 3.3 3.31 9 683 0.01 0.0						4.12 2.2 2.21 40 879 0.05 0.1 2.5	04	
Percent Grade (%) Right Turn Channelized Median Type Storage Critical and Follow-up H Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec) Delay, Queue Length, an Flow Rate, v (veh/h) Capacity, c (veh/h) v/c Ratio 95% Queue Length, Qas (veh) 95% Queue Length, Qas (ft) Control Delay (s/veh)			ervice		vided	7.5 5.42 3.5 3.51 32 301 0.10 0.3 7.6 18.4		9 683 0.01 0.0 10.3						4.12 2.2 2.21 40 879 0.05 0.1 2.5 9.3	0.4 A	
Percent Grade (%) Right Turn Channelized Median Type Storage Critical and Follow-up H Base Critical Headway (sec) Critical Headway (sec) Base Follow-Up Headway (sec) Follow-Up Headway (sec) Delay, Queue Length, an Flow Rate, v (veh/h) Capacity, c (veh/h) V/c Ratio 95% Queue Length, Qas (veh) 95% Queue Length, Qas (ft)			ervice		vided	7.5 5.42 3.5 3.51 32 301 0.10 0.3 7.6 18.4 C		6.22 3.3 3.31 9 683 0.01 0.0						4.12 2.2 2.21 40 879 0.05 0.1 2.5 9.3 A	0.4 A	

Table 11. Crestwood Dr and JFK Rd Two-Way Stop HCS Control Report

		ŀ	HCS T	Two-	Way	Stop	-Cor	ntrol	Repo	ort _						
General Information							Site	Inforr	natio	n						
Analyst	Payto	n Stuart					Inters	ection			Crest	wood/Jo	hn F. Ke	nnedy		
Agency/Co.	U of I						Jurisc	liction			Dubu	ique Cou	ınty			
Date Performed	2/20/	2024					East/	West Str	eet		Crest	wood				
Analysis Year	2024						North	n/South :	Street		John	F. Kenne	edy			
Time Analyzed	10:37						Peak	Hour Fac	tor		0.92					
Intersection Orientation	North	-South					Analy	sis Time	Period (hrs)	1.00					
Project Description	JFK R	edesign														
Lanes																
) 4 ÷ ₹ ↑ ₹ ↑	រាក Majo	ጎ ተ ተ ሦ r Street Nor	ተ ት ፖ th-South	1 4 4 7 4 1								
Vehicle Volumes and Adj	ustme															
Approach	_		ound			_	bound			_	bound		_	_	bound	
Movement	U	L	Т	R	U	L	T	R	U	L	Т	R	U	L	T	R
Priority	\perp	10	11	12		7	8	9	10	1	2	3	4U	4	5	6
Number of Lanes	+	1	0	1	-	0	0	0	0	1	2	0	0	0	2	0
Configuration	_	L		R						L	T				T	TR
Volume (veh/h)	+-	2		3					0	4	411	-	-		411	4
Percent Heavy Vehicles (%)	\vdash	1		1					3	3						\vdash
Proportion Time Blocked	+		2													
Percent Grade (%) Right Turn Channelized	+		lo													
Median Type Storage	+-	'		Undi	vided											
Critical and Follow-up Ho	dwa															
	Tauwa	_		T	_	_	_					_	_	_		_
Base Critical Headway (sec)	-	7.5		6.9						4.1						\vdash
Critical Headway (sec) Base Follow-Up Headway (sec)	+	7.22		7.12						4.16 2.2						
Follow-Up Headway (sec)	+	3.51		3,31						2.23						
Delay, Queue Length, and	d Leve		rvice							2,23						
	T		T 1100	_								_			_	_
Flow Rate, v (veh/h)	+	352		761						1099						
	+	0.01		0.00						0.00						
Capacity, c (veh/h)			1	1 0.00	l .				—	_			-	_	-	
v/c Ratio	+	_		0.0						0.0						
v/c Ratio 95% Queue Length, Q₃s (veh)		0.0		0.0						0.0						
v/c Ratio 95% Queue Length, Q ₈₅ (veh) 95% Queue Length, Q ₉₅ (ft)		_		0.0 0.0 9.7						0.0						
v/c Ratio 95% Queue Length, Q ₉₅ (veh)		0.0		0.0						0.0						
v/c Ratio 95% Queue Length, Q ₉₅ (veh) 95% Queue Length, Q ₉₅ (ft) Control Delay (s/veh)		0.0 0.0 15.3 C	2.0	0.0 9.7						0.0 8.3 A	.1					

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Table 12. Stoneman Rd and JFK Rd Two-Way Stop HCS Control Report

General Information Analyst Agency/Co. Date Performed Analysis Year Time Analyzed Intersection Orientation Project Description Lanes	U of I 2/20/ 2024 10:34 North JFK Re	2024		JALXANI		ጉተ	Inters Jurisd East/\ North Peak Analy	ection West Stre West Stre Hour Fac	eet Street		Dubu	que Cou		nnedy		
Agency/Co. Date Performed Analysis Year Time Analyzed Intersection Orientation Project Description	U of I 2/20/ 2024 10:34 North JFK Re	2024 n-South				ጉተ	Jurisd East/\ North Peak Analy	West Streen/South Streen	Street	hhrs)	Stone John I 0.92	que Cou man	inty	nnedy		
Date Performed Analysis Year Time Analyzed Intersection Orientation Project Description	2/20// 2024 10:34 North JFK Re	2024 n-South		JATAN		ጉተ	East/North Peak Analy	West Stre	Street	hrs)	Stone John I 0.92	man				
Analysis Year Time Analyzed Intersection Orientation Project Description	2024 10:34 North JFK Re	ı-South		D 4 4 Y ↑ ₹ C		ጉተ	North Peak Analy	Hour Face	Street	hrs)	John 1		dy			
Time Analyzed Intersection Orientation Project Description	10:34 North JFK Re	-South		74 + 14 + 14		ጉተ	Peak Analy	Hour Fac	tor	hrs)	0.92	F. Kenne	dy			
Intersection Orientation Project Description	North JFK Re	-South		7.4.4.7. ₹.C		ጉተ	Analy	sis Time		hrs)	_					
Project Description	JFK Re			74 + A 4 4 4 C		ጉተ	U	74 *Y1 PC	Period (hrs)	1.00					
		edesign		24 4 Y 1 7 7		ጉተ	r	-								
Lanes				74 t A & B C		ጉተ	r	-								
						ጉተ	r	-								
Vehicle Volumes and Adju	ıstme	nts														
Approach		Eastb	ound			West	bound			North	bound			South	bound	
Movement	U	L	Т	R	U	L	Т	R	U	L	Т	R	U	L	Т	R
Priority		10	11	12		7	8	9	10	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	2	0	0	- 1	2	1
Configuration		L		R		_				L	Т	TR		L	T	R
Volume (veh/h)		1		3					0	19	249	8	0	0	247	6
Percent Heavy Vehicles (%)		3		3		_			3	3			3	3		
Proportion Time Blocked			<u> </u>													
Percent Grade (%) Right Turn Channelized			lo												lo	
Median Type Storage		IN.	10	Undi	vided									IN.	10	
				Undi	vided											
Critical and Follow-up Hea	adwa	_		_												
Base Critical Headway (sec)		7.5		6.9		_				4.1				4.1		
Critical Headway (sec)		7.76		7.06						4.16				4.16		
Base Follow-Up Headway (sec)		3.53		3.3						2.2				2.2		
Follow-Up Headway (sec)										2.23				2.23		
Delay, Queue Length, and	Leve	_	ervice	_											,	
Flow Rate, v (veh/h)		1		3						21				0		
Capacity, c (veh/h)		471		884						1278				1273		
v/c Ratio		0.00		0.00						0.02				0.00		
95% Queue Length, Q ₉₅ (veh) 95% Queue Length, Q ₉₅ (ft)		0.0		0.0						0.0				0.0		
Control Delay (s/veh)		12.7		9.1						7.9				7.8		
Level of Service (LOS)		12.7 B		9.1 A						7.9 A				7.6 A		
Approach Delay (s/veh)			0.0					L			.5				.0	
Approach LOS			A								. <u>. </u>				Α	

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Table 13. Daykin Ct and JFK Rd Two-Way Stop HCS Control Report

		ŀ	HCS T	wo-	Way	Stop	-Cor	ntrol	Repo	ort						
General Information							Site	Infor	natio	n						
Analyst	Payto	n Stuart					Inters	ection			Dayki	in/John l	F. Kenne	dy		
Agency/Co.	U of I						Juriso	diction			Dubu	que Cou	unty			
Date Performed	2/20/	2024					East/	West Str	eet		Dayki	in				
Analysis Year	2024						North	n/South	Street		John	F. Kenne	dy			
Time Analyzed	10:31						Peak	Hour Fa	ctor		0.92					
Intersection Orientation	North	-South					Analy	sis Time	Period ((hrs)	0.25					
Project Description	JFK R	edesign														
Lanes																
				4 4 4 4 6 6	ិ <mark>ភា ។</mark> Major	1 1 T	ት ↑ ት ሰ rth-South	← → → ←								
Vehicle Volumes and Adj	ustme															
Approach		_	ound			_	bound	T -		_	bound			_	bound	
Movement	U	L	T	R	U	1 7	T	R 9	1U	L	T	R	U 4U	L	T	R
Priority		10	11	12		0	8	0	0	1	2	3	0	1	5	6
Number of Lanes Configuration	+	<u>'</u>	0	R		0	0	-	0	1 L	T	TR	-	 	T	TR
Volume (veh/h)		4		35					0	181	565	13	0	19	534	13
Percent Heavy Vehicles (%)		3		3					3	3	303	1.5	3	3	354	-
Proportion Time Blocked									-							\vdash
Percent Grade (%)	_		1													_
Right Turn Channelized		N	lo													
Median Type Storage				Undi	vided											_
Critical and Follow-up H	eadwa	ys														
Base Critical Headway (sec)	Т	7.5		6.9				П		4.1	П			4.1		П
Critical Headway (sec)		7.76		7.06						4.16				4.16		
Base Follow-Up Headway (sec)		3.5		3.3						2.2				2.2		
Follow-Up Headway (sec)		3.53		3.33						2.23				2.23		
Delay, Queue Length, an	d Leve	l of Se	ervice													
Flow Rate, v (veh/h)	Т	4		38						197				21		Г
Capacity, c (veh/h)		80		673						971				943		
v/c Ratio		0.05		0.06						0.20				0.02		
95% Queue Length, Q ₉₅ (veh)		0.2		0.2						0.8				0.1		
95% Queue Length, Q ₉₅ (ft)		5.1		5.1						20.5				2.6		
Control Delay (s/veh)		52.5		10.7						9.6				8.9		
Level of Service (LOS)		F		В						Α		L		Α		
Approach Delay (s/veh)			5.0								.3				.3	
Approach LOS		ts Resen	В				C Versio				A			ted: 4/4	А	

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Table 14. University Ave and JFK Rd Two-Way Stop HCS Control Report

		ŀ	HCS ⁻	Two-	Way	Stop	-Cor	ntrol	Repo	ort						
General Information	_			_	_		Site	Inforr	natio	n	_			_	_	
Analyst	Payto	n Stuart					Inters	ection			Unive	rsity/Jol	nn F. Ker	nedy		
Agency/Co.	U of I						Jurisd	liction			Dubu	que Cou	ınty			
Date Performed	2/20/	2024					East/	West Stre	eet		Unive	rsity				
Analysis Year	2024						North	/South S	Street		John	F. Kenne	edy			
Time Analyzed	9:47						Peak	Hour Fac	tor		0.92					
Intersection Orientation	North	-South					Analy	sis Time	Period (hrs)	0.25					
Project Description	JFK R	edesign														
Lanes																
				7447177		† † 1 ቀ ጕ r Street: Nor	↑ ↑ ↑ ↑ th-South	14*71								
Vehicle Volumes and Adj	ustme	nts														
Approach		Eastb	ound			West	bound			North	bound			South	bound	
Movement	U	L	T	R	U	L	Т	R	U	L	Т	R	U	L	Т	R
Priority		10	11	12		7	8	9	10	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	1	0	0	2	0	0	1	2	0
Configuration								R			Т	TR		L	Т	
Volume (veh/h)								91			247	20	0	21	277	
Percent Heavy Vehicles (%)								3					3	3		
Proportion Time Blocked																
Percent Grade (%)							3									
Right Turn Channelized	_					N	lo .									
Median Type Storage	<u> </u>			Undi	vided				<u> </u>							
Critical and Follow-up He	eadwa	ys														
Base Critical Headway (sec)								6.9						4.1		
Critical Headway (sec)								7.26						4.16		
Base Follow-Up Headway (sec)								3.3						2.2		
Follow-Up Headway (sec)								3.33						2.23		
Delay, Queue Length, and	d Leve	l of Se	ervice													
Flow Rate, v (veh/h)								99						23		
Capacity, c (veh/h)								862						1261		
v/c Ratio								0.11						0.02		
95% Queue Length, Q₃₅ (veh)								0.4						0.1		
95% Queue Length, Q ₉₅ (ft)								10.2						2.6		
Control Delay (s/veh)								9.7						7.9		
Level of Service (LOS)								А						Α		
Approach Delay (s/veh)							.7).6	
Approach LOS							А							1	A	

Tuesday (February 6th, 2024) Highway Capacity Software Tables:

Table 144. Pennsylvania Ave and JFK Rd Tuesday Noon-1PM HCS Existing Conditions

		HCS	Sigr	nalize	d Inte	ersect	ion R	esult	s Sun	nmary	,				
General Inform	nation								ntersec	tion Inf	ormatic			d.le.	KT.
	iation	1						_					- ú	4.1	
Agency								_	Duration		1.000		- 2		
Analyst						e 2/15/2	2024	-	Area Typ	е	Other				-
Jurisdiction				Time F	Period				PHF		1.00				=
Urban Street		John F Kennedy		Analys	sis Yea	r 2024			Analysis	Period	1> 12	2:00	100		
Intersection		12-1pm Penn/JFK		File N	ame	TUES	DAY Int	ersecti	on (Pen	n-JFK)_	existing	J.XUS		5 1 5	
Project Descrip	tion												1	4144	21
Demand Inforr	nation				EB			WE	3		NB			SB	
Approach Move				L	T	R	1	T	R	T L	T	R	L	T	R
Demand (v), v				166	197	105	80	164	_	127	649	_	97	562	174
0: 11.5															
Signal Informa Cycle, s	64.0	Reference Phase	2		6		215			R	∄ .			_>	→
Offset, s	04.0	Reference Point	End		15	1						1	2	3	4
Uncoordinated	Yes		On	Green	-	1.0	17.8	5.3	1.3	12.3	3				
		Simult. Gap E/W		Yellow		0.0	4.0	4.0	0.0	4.0	`	`	Ψ	✓.	-4
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		6	0	7	Y 8
Timer Results				EBI		EBT	WB	L	WBT	NB		NBT	SBI		SBT
Assigned Phas	e			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	I, S			11.8	3	18.8	10.5	5	17.5	11.8	3	23.9	10.8	3	22.9
Change Period	, (Y+R	ε), S		5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Hea	dway (/	<i>МАН</i>), s		3.1		3.1	3.1		3.1	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	(g s), S		6.7		12.6	4.2		7.0	5.6		16.9	4.1		13.0
Green Extension	n Time	(ge), S		0.2		1.0	0.1		1.1	0.3		1.8	0.1		0.5
Phase Call Pro	bability			0.95	5	1.00	0.76	5	1.00	0.94	4	1.00	0.80)	1.00
Max Out Proba	bility			0.00		0.00	0.00)	0.00	0.00		0.06	0.00)	1.00
Movement Gro	un Res	ults			EB			WB			NB			SB	
Approach Move				L	T	R	L	T	R	T	T	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow I) voh/h		166	302	10	80	164	89	154	459	439	90	353	327
•		ow Rate (s), veh/h/l	n	1767	1746		1767	1856		1838	1856	1776	1838	1856	1705
Queue Service			11	4.7	10.6		2.2	5.0	3.1	3.6	14.9	14.9	2.1	10.9	11.0
Cycle Queue C				4.7	10.6		2.2	5.0	3.1	3.6	14.9	14.9	2.1	10.9	11.0
Green Ratio (g		2 (3 .), 2		0.30	0.21		0.28	0.19	0.19	0.38	0.29	0.29	0.37	0.28	0.28
Capacity (c), v	_			435	372		278	358	303	385	544	521	292	517	475
Volume-to-Cap		rtio (X)		0.381	0.811		0.287	0.459	0.294	0.401	0.843	0.843	0.307	0.684	0.689
		t/In (95 th percentile)	80	192		38	95	50	62	231	218	36	191	177
		eh/ln (95 th percenti		3.1	7.5		1.5	3.7	1.9	2.4	9.0	8.7	1.4	7.5	7.1
	//	RQ) (95 th percent	,	0.44	0.00		0.33	0.00	0.43	0.62	0.00	0.00	0.30	0.00	0.00
Uniform Delay				17.7	24.0		18.7	22.9	22.2	14.6	21.3	21.3	15.8	20.6	20.7
Incremental De				0.2	1.7		0.2	0.3	0.2	0.2	0.9	0.9	0.1	2.2	2.5
Initial Queue De	elay (d	з), s/veh		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/v	eh		17.9	25.7		18.9	23.3	22.4	14.7	22.1	22.2	16.0	22.8	23.1
Level of Service	e (LOS)			В	С		В	С	С	В	С	С	В	С	С
Approach Delay	y, s/veh	/LOS		22.9)	С	22.0	0	С	21.1	1	С	22.1	1	С
Intersection De	lay, s/ve	h / LOS				2	1.8						С		
Multimada! D					EC			MC			NE			OB	
Multimodal Re Pedestrian LOS		11.00		2.28	EB	В	2.2	WB	В	2.10	NB	В	1.91	SB	В
Bicycle LOS So				1.26	_	A	1.04		A	1.20		A	1.9		A
DICYCIE LOS SC	ore / LC	/3		1.20	,	А	1.04	+	А	1.20	,	А	1.17		A

Table 2. Pennsylvania Ave and JFK Rd Tuesday Noon-1PM HCS Optimized Conditions

		HCS	Sigr	nalize	d Inte	ersect	ion R	esul	ts Sun	nmary	'				
Company linform										41 a.a. land				4 44 1	s I.
General Inforr	nation	1						\rightarrow	Intersec		_		- ú	417	
Agency								\rightarrow	Duration		1.000		- 2		
Analyst						e 2/15/2	2024		Area Typ	e	Other				*_
Jurisdiction				Time F	Period				PHF		1.00		\$ - V	ΝÎτ	Ę
Urban Street		John F Kennedy		Analys	sis Yea	r 2024			Analysis	Period	1> 12	:00	2,		
Intersection		12-1pm Penn/JFK		File N	ame	TUES	SDAY Int	tersect	ion (Pen	n-JFK)_	existing	FINA		ጎተተ	
Project Descrip	otion												1	বাকপ	14 (1
Demand Infor	mation				EB			WE	3		NB			SB	
Approach Mov	ement			L	Т	R	1	Т	R	1 .	Т	R		Т	R
Demand (v),				166	197	105	_	164	_	127	649	_	97	562	174
							I II:								
Signal Informa	_	D (D)			7		25	La	ا جا ہے۔	2	₩.			7	Ð
Cycle, s	66.6	Reference Phase	2	-	5	151	ଆ "ୀ	7	É	:: ²	E	1 -	2	3	
Offset, s	62	Reference Point	End	Green	5.7	0.9	19.7	5.4	1.4	12.7					
Uncoordinated		Simult. Gap E/W	On	Yellow		0.0	4.0	4.0		4.0		Y	V	/ _	→
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		5	6	7	Z
Timer Results				EBI		EBT	WB	L	WBT	NBI		NBT	SBI		SBT
Assigned Phas				3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1	_	4.0	1.1		4.0
Phase Duration	n e			12.0	-	19.3	10.6	-	17.9	11.8	-	25.7	10.9	-	24.8
Change Period		.) s		5.2		5.2	5.2	_	5.2	5.2	_	5.1	5.2	_	5.1
Max Allow Hea	, ,	,,		3.1	_	3.1	3.1	-	3.1	3.1	-	3.1	3.1	\rightarrow	3.1
Queue Clearar		•		6.9	-	13.0	4.3	_	7.2	5.7	-	17.1	4.1	-	13.2
				0.9	-	1.0	0.1	_	1.0	0.3	$\overline{}$	3.4	0.1	\rightarrow	3.4
Green Extension		(g e), S		_	_		_	_			-			-	
Phase Call Pro				0.98		1.00	0.7	_	1.00	0.94	_	1.00	0.81		1.00
Max Out Proba	ability			0.00	J	0.00	0.00	J	0.00	0.00	,	0.00	0.00	,	0.00
Movement Gr	oup Res	sults			EB			WB			NB			SB	
Approach Mov	ement			L	Т	R	L	T	R	L	Т	R	L	T	R
Assigned Move	ement			3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow	Rate (v	'), veh/h		166	302		80	164	89	154	459	439	90	353	327
Adjusted Satur	ation Flo	ow Rate (s), veh/h/l	n	1767	1746		1767	1856	1572	1838	1856	1776	1838	1856	170
Queue Service				4.9	11.0		2.3	5.2	3.2	3.7	15.1	15.1	2.1	11.1	11.2
		e Time (<i>g</i> ₀), s		4.9	11.0		2.3	5.2	3.2	3.7	15.1	15.1	2.1	11.1	11.2
Green Ratio (0.29	0.21		0.27	0.19	0.19	0.40	0.31	0.31	0.38	0.30	0.30
Capacity (c),	veh/h			428	372		272	355	301	394	576	551	300	551	506
Volume-to-Cap	acity Ra	atio (X)		0.388	0.813		0.294	0.462	0.296	0.392	0.796	0.797	0.299	0.641	0.64
Back of Queue	(Q), f	t/ln (95 th percentile)	85	200		41	100	52	63	237	223	37	186	171
Back of Queue	(Q), v	eh/ln (95 th percenti	le)	3.3	7.8		1.6	3.9	2.0	2.5	9.3	8.9	1.4	7.3	6.8
Queue Storage	Ratio (RQ) (95 th percent	ile)	0.47	0.00		0.35	0.00	0.46	0.63	0.00	0.00	0.31	0.00	0.00
Uniform Delay				18.6	25.1		19.6	24.0	_	14.4	21.1	21.1	15.7	20.4	20.5
Incremental De	elay (d 2), s/veh		0.2	1.7		0.2	0.3	0.2	0.2	0.6	0.7	0.1	0.3	0.4
Initial Queue D	elay (d	з), s/veh		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay ((d), s/ve	eh		18.8	26.7		19.8	24.3	23.4	14.6	21.8	21.8	15.8	20.7	20.8
Level of Service	e (LOS)			В	С		В	С	С	В	С	С	В	С	С
Approach Dela	y, s/veh	/LOS		23.9	9	С	23.0	0	С	20.7	7	С	20.2	2	С
Intersection De	elay, s/ve	eh / LOS				2	1.4						С		
Multimodal Re					EB			WB			NB			SB	
Pedestrian LO				2.28	_	В	2.28	_	В	2.10	-	В	1.91	_	В
Bicycle LOS So	core / LC	OS		1.26	3	Α	1.04	4	Α	1.20)	Α	1.17		Α

Table 345. Wacker Dr and JFK Rd Tuesday Noon-1PM HCS Existing Conditions

			Sigr								_				
General Inform	nation								Interes	ction I	nformat	ion		deet.	N U
Agency	iation								Duratio		1.00			4.4	
Analyst				Analys	ie Date	2/20/2	024		Area Ty		Othe		- 4		
Jurisdiction				Time F		212012	024		PHF	рс	1.00		2 4		Α
Urban Street		Wacker/JFK			is Year	2024		_	Analys	s Derin			- 3		
Intersection		Wacker/JFK NOON	_1PM	File Na		-	DAY Int	ersec			_	ting.xus	-		
Project Descrip	tion	Wacker/JFK TUESI		T IIC IV	umo	11023	DAT IIII	01300	uon (vv	icker-or	rt/_cxis	ung.xus	- 4	4 - 47	1e (*
r roject Bescrip	uon	Wackenson K TOESE	, n												
Demand Inform	nation				EB		$\overline{}$	W	В	$\overline{}$	NE	3	$\overline{}$	SB	
Approach Move	ement			L	Т	R	L	Т	R		Т	R	L	Т	R
Demand (v), v				360	3	64	4	5	6	7	51	1 5	13	415	21:
, ,															
Signal Informa	ition				I		725	Τ.	2	Т					
Cycle, s	53.0	Reference Phase	2		15	517		²₩.	7			>	Ψ		4
Offset, s	0	Reference Point	End	Green	0.9	4.1	15.4	9.9	9 1.3	2 0.	0	1	2	3	Y
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	3.0		_		人 之	b	7	→
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.5				5	0	7	
Timer Results				EBI	L	EBT	WBI	L	WBT	N	BL	NBT	SBI	L	SBT
Assigned Phase	е					4			8		5	2	1		6
Case Number						10.0			12.0	1	.1	4.0	1.1		4.0
Phase Duration	ı, s					15.4			6.7	10	.0	25.0	5.9		20.9
Change Period	, (Y+R	c), S				5.5			5.5	5	.0	5.5	5.0		5.5
Max Allow Head	Allow Headway (MAH), s					3.3			3.2	3	.1	3.1	3.1		3.1
Queue Clearan	ue Clearance Time (g s), s					9.1			2.2	5	.2	15.6	2.3		10.1
Green Extension						0.9		\neg	0.0	0	.2	3.8	0.0		3.8
Phase Call Pro	en Extension Time (g e), s se Call Probability					1.00			0.20	0.	92	1.00	0.17	7	1.00
Max Out Proba	bility					0.00		\Box	0.00	0.	00	0.00	0.00)	0.00
Movement Gro	un Des	nulte			EB			WE	2	_	NB			SB	
Approach Move		uita		L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow I) veh/h		180	247		8	-	7	167	547	545	13	331	297
		ow Rate (s), veh/h/l	n	1810	1758	-	1853		1650	_	_		1810	1900	168
Queue Service				4.8	7.1		0.2		0.2	3.2	13.6		0.3	7.9	8.1
		e Time (gc), s		4.8	7.1		0.2		0.2	3.2	13.6		0.3	7.9	8.1
Green Ratio (g		o rano (g c j, s		0.19	0.19		0.02		0.02	-			0.31	0.29	0.29
Capacity (c), v				340	331		42		38	420		697	206	552	489
Volume-to-Cap		atin (X)		0.529	0.747		0.187		0.19	_			0.063	0.599	0.60
		t/ln (95 th percentile)	82	120		4		4	47	190	189	4	135	122
		eh/In (95 th percenti		3.3	4.8		0.2		0.2	1.9	7.6	7.6	0.2	5.4	4.9
		RQ) (95 th percent		0.16	0.24		0.10		0.09	-	$\overline{}$	_	0.2	0.27	0.2
Uniform Delay (iic)	19.5	20.4		25.5		25.5	-	-	-	14.1	16.2	16.3
Incremental De				0.5	1.3		0.8		0.9	0.1	-	0.4	0.0	0.4	0.5
Initial Queue De				0.0	0.0		0.0		0.9	0.1	-	0.4	0.0	0.4	0.0
Control Delay (19.9	21.7		26.3		26.4	_	-		14.1	16.6	16.3
Level of Service				19.9 B	C C		20.3 C		C 20.4	B	B	B	B	B	10. B
Approach Delay				20.9		С	26.3		C	-	I.8	B	16.6		B
Intersection De				20.8	'		20.3 5.5		-		.0		B 10.0	,	В
mersection De	idy, S/VE	air LUS				10							U		
Multimodal Re	sulte				EB			WE	3		NB			SB	
Pedestrian LOS		/105		2.29	_	В	2.29	_	, В	1	89	В	2.09		В
r vucanian LU2	Joure	, 200		2.23			2.28	_		1	00		2.03		

Table 446. Wacker Dr and JFK Rd Tuesday Noon-1PM HCS Existing Conditions Optimized

	10	ible 446. Wacker L										ptimize	ed .		
	_	HCS	SSigr	nalize	d Inte	rsect	ion R	esu	lts Sun	ımary					_
General Inform	otion								Intersec	tion Inf	ormotic			daet	N V
	lation										1.000			4.4	
Agency				Amaba	ia Data	la mon	024		Duration		_		- 2		
Analyst						2/20/2	024	_	Area Typ	е	Other			.1	Α
Jurisdiction		Manharite		Time F		2024			PHF	Desired	1.00	20			**
Urban Street		Wacker/JFK	4014	-	is Year	-	DAV I-4		Analysis		1> 7:0				
Intersection		Wacker/JFK NOON		File Na	ame	TUES	DAY Int	ersec	tion (Wac	Ker-JFK	.)_existi	ngFIN	- 4	<u> ነተተ</u>	
Project Descrip	tion	Wacker/JFK TUESI	DAY					-						4 47	e ii
Demand Inform	nation				EB			W	В		NB		$\overline{}$	SB	
Approach Move	ment			L	Т	R	L	T	R	L	Т	R	L	Т	R
Demand (v), v	eh/h			360	3	64	4	5	6	79	511	5	13	415	21
Signal Informa		I =	_		7		1215	La	\exists		Į		-1-		_
Cycle, s	52.3	Reference Phase	2		5	1 507	7 M	"R	E			1	2	3	➾
Offset, s	0	Reference Point	End	Green	0.9	4.1	15.1	9.6	1.2	0.0					5
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	3.0		0.0			P _	- ∕-	Z
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.5	2.5	0.0		- 6	0	7	
Timer Results				EBI		EBT	WBI	T	WBT	NBI		NBT	SBI		SBT
Assigned Phase	P.			LDI		4	VVDI	+	8	5		2	1		6
Case Number						10.0			12.0	1.1	+	4.0	1.1		4.0
Phase Duration	, S					15.1		\neg	6.7	10.0	,	24.7	5.9		20.6
Change Period	(Y+R	c), S				5.5		\neg	5.5	5.0		5.5	5.0		5.5
	Allow Headway (MAH), s					3.3		\neg	3.2	3.1	\neg	3.1	3.1		3.1
	: Allow Headway (MAH), s ue Clearance Time (g s), s					9.0		\rightarrow	2.2	5.1		15.3	2.3		10.0
Green Extensio						0.6		\neg	0.0	0.2	\neg	3.7	0.0		2.9
Phase Call Prol		10 //				1.00		\neg	0.20	0.91		1.00	0.17	7	1.00
Max Out Proba	bility					0.09			0.00	0.00		0.01	0.00		0.34
Movement Gro	_	Bults			EB			WE			NB			SB	_
Approach Move				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow I		•		180	247	\vdash	8		7	166	542	540	13	331	29
		ow Rate (s), veh/h/l	П	1810	1758		1853		1650	1810	1900	1893	1810	1900	168
Queue Service				4.7	7.0		0.2		0.2	3.1	13.3	13.3	0.3	7.9	8.0
		e Time (g ε), s		4.7	7.0		0.2		0.2	3.1	13.3	13.3	0.3	7.9	8.0
Green Ratio (g				0.18 333	0.18 324		0.02 42		0.02	0.41 421	0.37 697	0.37 695	0.31 208	0.29 548	0.2 48
Capacity (c), v Volume-to-Capa		tio (V)		0.540	0.763		0.186		0.189	0.394	0.777	0.777	0.063	0.603	0.6
		t/In (95 th percentile)	81	119		4		4	46	185	185	4	134	12
		eh/In (95 th percenti		3.3	4.8		0.2		0.2	1.8	7.4	7.4	0.2	5.4	4.8
		RQ) (95 th percent		0.16	0.24		0.10		0.09	0.24	0.37	0.37	0.07	0.27	0.2
Uniform Delay (19.4	20.3		25.2		25.2	11.2	14.7	14.7	14.0	16.1	16.
Incremental De				0.5	1.4		0.8		0.9	0.1	0.4	0.4	0.0	0.4	0.5
Initial Queue De	elay (d	₃), s/veh		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (19.9	21.8		26.0		26.1	11.3	15.1	15.1	14.0	16.5	16.
Level of Service				В	С		С		С	В	В	В	В	В	В
Approach Delay				21.0		С	26.0		С	14.6	6	В	16.5	5	В
Intersection De	lay, s/ve	eh / LOS				16	5.4						В		
	oulto				ED			WE	2		NB			SB	
Multimodal D-	ฮนแร				EB			VVE	,		IND			30	_
Multimodal Re Pedestrian LOS		/1.0S		2.29		В	2.29		В	1.89) I	В	2.09) I	В

Table 1447. Pennsylvania Ave and JFK Rd Tuesday Noon-1PM HCS 5 Year Projection Conditions

		HCS	Sigr	nalize	d Int	ersect	ion R	esult	s Sun	ımary					
Canaral Inform	aation								ntoroco	tion Inf	o rom o ti c			4.74.1	K'U
General Inform	nation							$\overline{}$	ntersec		_		- 6	ALL	
Agency				A 1	:- D-1	- 0450	2024	\rightarrow	Duration,		1.000		7		
Analyst						e 2/15/2	2024	-	Area Typ	e	Other			.1.	•
Jurisdiction		laba E Kasasaka		Time F		- 2024			PHF	D-d-d	1.00	-00		T.	
Urban Street		John F Kennedy				r 2024	ND 437 1-4		Analysis		1> 12				
Intersection		12-1pm Penn/JFK		File Na	ame	TUES	DAY IN	ersecti	on (Peni	n-JFK)_	SYEAR	projec	- 4	<u>ነተተ</u>	
Project Descrip	tion													A 1 W 1	P. II.
Demand Inforr	nation				EB			WE	}		NB			SB	
Approach Move	ement			L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), v	eh/h			174	207	110	84	172	94	133	682	95	102	591	183
Signal Informa	ation						125				E 3				
Cycle, s	67.3	Reference Phase	2	1	1 2				4	R	.		<u> </u>	<i>></i> │	♦
Offset, s	0	Reference Point	End		1	<u></u>			S			1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Green		0.9	19.6	5.6	1.6	13.2 4.0	<u>-</u> [-4-	_	_
Force Mode	Fixed	Simult. Gap N/S	On	Yellow Red	1.2	0.0	4.0 1.1	1.2	0.0	1.2		5	Y	7	←
T GIGG IIIGG	Titou	Simula Supriso			11.2	10.0	1111	1	0.0	11.2					
Timer Results				EBI	L	EBT	WB	L	WBT	NB	L	NBT	SBI		SBT
Assigned Phas	е			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	1, S			12.3	3	20.0	10.8	3	18.4	11.9)	25.6	11.0)	24.7
Change Period	, (Y+R	ε), S		5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Hea	dway (/	<i>МАН</i>), s		3.1		3.1	3.1		3.1	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	(gs), S		7.1		13.7	4.4		7.5	6.0		18.5	4.3		14.0
Green Extension	n Time	(ge), s		0.3		1.1	0.1		1.1	0.3		1.9	0.1		0.0
Phase Call Pro	bability			0.96	6	1.00	0.79)	1.00	0.95	5	1.00	0.83	3	1.00
Max Out Proba	bility			0.00		0.00	0.00		0.00	0.00)	0.09	0.00		1.00
Movement Gro	oup Res	sults			EB			WB			NB			SB	
Approach Move				L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow I), veh/h		174	317	1.2	84	172	94	162	483	462	94	372	343
		ow Rate (ε), veh/h/l	n	1767	1746		1767	1856	1572	1838	1856	1776	1838	1856	170
Queue Service				5.1	11.7		2.4	5.5	3.4	4.0	16.5	16.5	2.3	12.0	12.0
Cycle Queue C				5.1	11.7		2.4	5.5	3.4	4.0	16.5	16.5	2.3	12.0	12.0
Green Ratio (g		(2-7-		0.30	0.22		0.28	0.20	0.20	0.39	0.30	0.30	0.38	0.29	0.29
Capacity (c), v				433	384		271	365	309	375	564	540	284	541	497
Volume-to-Cap		itio (X)		0.402	0.825		0.309	0.471		0.431	0.855	0.855	0.332	0.687	0.69
Back of Queue	(Q), fl	t/In (95 th percentile)	89	210		43	106	56	68	254	239	40	206	190
		eh/ln (95 th percenti		3.5	8.2		1.7	4.1	2.2	2.7	9.9	9.6	1.5	8.1	7.6
		RQ) (95 th percent		0.49	0.00		0.37	0.00	0.48	0.68	0.00	0.00	0.33	0.00	0.00
Uniform Delay	(d 1), s	/veh		18.5	25.1		19.6	24.0	23.1	15.1	22.1	22.1	16.4	21.2	21.2
Incremental De	lay (d 2), s/veh		0.2	1.8		0.2	0.4	0.2	0.2	1.2	1.3	0.2	2.1	2.4
Initial Queue D	elay (d	з), s/veh		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/ve	eh		18.7	26.8		19.8	24.3	23.4	15.3	23.3	23.3	16.6	23.3	23.6
Level of Service	e (LOS)			В	С		В	С	С	В	С	С	В	С	С
Approach Delay	y, s/veh	/LOS		23.9)	С	23.0		С	22.1	1	С	22.6	6	С
Intersection De	lay, s/ve	eh / LOS				2	2.7						С		
Multimodal Re	eulte				EB			WB			NB			SB	
	Juito				_	В	2.28	_	В	2.10	_	В	1.91	_	В
Pedestrian LOS	Score	/108		2.28											

Table 1548. Pennsylvania Ave and JFK Rd Tuesday Noon-1PM HCS 5 Year Projection Conditions Optimized

		пс	o olgi	ialize	u mie	1560	IOII K	esuit	s Sun	ıııaı y					
General Inform	nation								ntersec	tion Info	ormatic	nn	I J	4741	K U
Agency	iution								Duration.		1.000			411	
Analyst				Analys	eie Date	2/15/2	2024	\rightarrow	Area Typ		Other		- 2 4		
Jurisdiction				Time F		2/13/2	.024		PHF		1.00		→ 2		-
Urban Street		John F Kennedy				2024		_	Analysis	Period	1> 12	-00	- -		
Intersection		12-1pm Penn/JFK		File Na			:DAV Int		on (Peni				-		
Project Descrip	tion	12-1piii i eiiii/oi ik		I lie IV	anne	TOES	DAI III	ersecti	on (i em	FOI IX)_	JILAN	projec	- 4	4107	14 14
r roject Descrip	uon														
Demand Inform	nation				EB		$\overline{}$	WB	1	Т	NB		$\overline{}$	SB	_
Approach Move	ment			L	Т	R	L	T	R	L	Т	R	L	T	R
Demand (v), v	eh/h			174	207	110	84	172	94	133	682	95	102	591	18
Signal Informa	tion				7	\top	125	Τ.,		T.	<u></u>			_	-5
Cycle, s	70.9	Reference Phase	2		7	50		2 L		R	è	\ \4	P _		Z
Offset, s	68	Reference Point	End	Green	6.0	0.8	22.1	5.7	1.9	13.7		1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	4.0	0.0	4.0			KD2	/	Z
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		- 6	0	7	₹
Timer Results				EBI	L	EBT	WB	L	WBT	NBI	L	NBT	SBI	L	SBT
Assigned Phase	е			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	, S			12.8	3	20.8	10.9)	18.9	12.0		28.0	11.2	2	27.2
Change Period,	(Y+R	c), S		5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Head	Allow Headway (MAH), s			3.1		3.1	3.1		3.1	3.1		3.1	3.1		3.1
Queue Clearan	ue Clearance Time (g s), s			7.4		14.3	4.6		7.9	6.1		19.0	4.3		14.4
Green Extensio	eue Clearance Time (g s), s en Extension Time (g e), s			0.3		1.1	0.2		1.1	0.3		3.6	0.2		3.4
Phase Call Prol	bability			0.97	7	1.00	0.81		1.00	0.96	5	1.00	0.85	5	1.00
Max Out Probal	bility			0.00)	0.00	0.00		0.00	0.00		0.00	0.00)	0.08
Movement Gro	oup Res	sults			EB			WB			NB			SB	
Approach Move				L	Т	R	L	Т	R	L	Т	R		Т	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow F), veh/h		174	317		84	172	94	162	483	462	94	372	34
		ow Rate (s), veh/h/l	n	1767	1746		1767	1856	1572	1838	1856	1776	1838	1856	170
Queue Service				5.4	12.3		2.6	5.9	3.7	4.1	17.0	17.0	2.3	12.3	12.
Cycle Queue C				5.4	12.3		2.6	5.9	3.7	4.1	17.0	17.0	2.3	12.3	12.
Green Ratio (g		, 3 - n -		0.30	0.22		0.28	0.19	0.19	0.41	0.32	0.32	0.40	0.31	0.3
Capacity (c), v				430	387		267	361	306	384	601	575	292	581	53
Volume-to-Capa		atio (X)		0.405	0.818		0.315			0.421	0.803	0.803	0.322	0.639	0.64
		t/In (95 th percentile)	97	220		47	114	60	71	262	247	41	204	18
		eh/ln (95 th percenti		3.8	8.6		1.8	4.5	2.3	2.8	10.2	9.9	1.6	8.0	7.5
		RQ) (95 th percent		0.53	0.00		0.41	0.00	0.52	0.71	0.00	0.00	0.34	0.00	0.0
Uniform Delay (-	19.6	26.5		20.9	25.6	24.7	15.1	22.1	22.1	16.4	21.1	21.
Incremental De				0.2	1.7		0.2	0.4	0.2	0.2	0.6	0.6	0.2	0.3	0.:
Initial Queue De		**		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Control Delay (*1		19.8	28.1		21.1	26.0	24.9	15.2	22.7	22.7	16.6	21.4	21.
Level of Service				В	C		C	C	C	В	C	C	В	C	C
Approach Delay				25.2		С	24.5	-	С	21.6		С	20.9		С
Intersection Del							2.4						C		
Multimodal Re	sults				EB	В		WB	В	2.10	NB	В		SB	В
Pedestrian LOS				2.28			2.28						1.91		

Table 1649. Pennsylvania Ave and JFK Rd Tuesday Noon-1PM HCS 10 Year Projection Conditions

		HCS	Sigr	nalize	d Inte	ersect	ion R	esul	ts Sun	nmary	,				
0	4:							ļ						daet	NT.
General Information										tion Inf	0rmatic 1.000		- 6		
Agency								Duration	, h		-				
Analyst			Analysis Date 2/15/20			2024				Other				•_	
Jurisdiction			Time Period			PHF			1.00			4-			
Urban Street John F Kennedy				Analysis Year 2024					Analysis	Period 1> 12:00			7		
Intersection 12-1pm Penn/JFK				File Na	ame	TUES	TUESDAY Intersection (Pen			n-JFK)_10YEARproje				111	
Project Descrip	tion												7	4.44	RIT
Demand Inform					EB		_	WE	,		NB			SB	
Demand Information				_	T 5	+ -	_	_	+ .	_		+ .	_	T 8	
Approach Movement			L	T	R	L	T	R	L	T	R	L 407	T	R	
Demand (v), v	eh/h			183	218	116	88	18	1 98	140	717	99	107	621	192
Signal Informa	tion		_		T U		1215	$\overline{}$	$\overline{}$		R.				5
Cycle, s	71.0	Reference Phase	2	1	1 2			~ 	4	ĸ	Ş		<u> </u>	_/_	7
Offset, s	0	Reference Point	End		1				* B	_		1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Green	-	0.7	21.6	5.8		14.2	<u>-</u> [-4-	_	_
Force Mode	Fixed	Simult. Gap E/W	On	Yellow Red	1.2	0.0	4.0 1.1	1.2	0.0	1.2		1	Y	7	↔
i orce wode	Tixeu	Samult. Gap N/S	Oll	IXCU	11.4	V.0	11.1	1.2	10.0	1.2			-	-	
Timer Results						EBT	WB	L	WBT	NBI		NBT	SBI	L	SBT
Assigned Phase			3		8	7			1	-		5			
Case Number			1.1		4.0	1.1		3.0	1.1	4.0		1.1		4.0	
Phase Duration, s			13.0 2		21.4	11.0		19.4 12.0		,	27.5		11.2		
Change Period, (Y+R c), s				5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Headway (MAH), s				3.1 3		3.1	3.1		3.1	3.1		3.1		3.1	
Queue Clearance Time (g s), s			7.7 1		15.0	4.7		8.2 6.4			20.3		4.5		
Green Extension Time (g e), s			0.3		1.1	0.1		1.2 0.3		\neg	2.0		0.1		
Phase Call Probability			0.97	-	1.00	0.82		1.00	0.97	7 1.00		0.86		1.00	
Max Out Probability			0.00		0.00	0.00	0	0.00	0.00		0.15	0.00)	1.00	
							MID			ND					
Movement Group Results				EB			WB			NB			SB		
Approach Movement		L	T	R	L	T	R	L	T	R	L	T	R		
	Assigned Movement		3	8	18	7	4	14	1	6	16	5	2	12	
Adjusted Flow Rate (v), veh/h		183	334		88	181	98	170	507	486	99	391	360		
Adjusted Saturation Flow Rate (s), veh/h/ln		1767	1746		1767	1856		1838	1856	1776	1838	1856	170		
Queue Service Time (g s), s		5.7	13.0		2.7	6.2	3.8	4.4	18.3	18.3	2.5	13.2	13.3		
Cycle Queue Clearance Time (g c), s Green Ratio (g/C)			5.7	13.0		2.7	6.2	3.8	0.40	18.3	18.3	2.5	13.2	13.3	
			0.31	0.23		0.28	0.20	_	0.40	0.31	0.31	0.39	0.30	0.30	
Capacity (c), v		-E- / 3/3		430	398		263	371	315	363	585	560	274	565	519
Volume-to-Capacity Ratio (X) Back of Queue (Q), ft/ln (95 th percentile)			100	0.839		0.334	_	0.311	0.469 76	0.868 284	0.868 268	0.361	0.691	0.69	
Back of Queue (Q), 1011 (95 th percentile)				3.9	9.0		1.9	119 4.7	2.4	3.0	11.1	10.7	1.7	8.8	8.2
Queue Storage Ratio (RQ) (95 th percentile)			0.55	0.00		0.42	0.00	+	0.76	0.00	0.00	0.36	0.00	0.0	
Uniform Delay (d 1), s/veh			19.2	26.2		20.6	25.2	_	15.7	23.0	23.0	17.1	21.8	21.6	
Incremental Delay (d 2), s/veh			0.2	1.9		0.3	0.4	0.2	0.2	2.4	2.5	0.2	2.1	2.3	
Initial Queue De		•		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh			19.5	28.1		20.9	25.6	_	15.9	25.4	25.5	17.3	23.8	24.	
Level of Service (LOS)			В	С		С	С	С	В	С	С	В	С	С	
Approach Delay, s/veh / LOS				25.1 C 24.2					C 24.0 C				23.2 C		
Intersection Delay, s/veh / LOS				24.0											
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.28		В	2.28		В	2.10		В	1.91	1	В
Bicycle LOS Score / LOS				1.34	1	Α	1.09	9	Α	1.28	3	Α	1.25	5	Α

Table 1750. Pennsylvania Ave and JFK Rd Tuesday Noon-1PM HCS 10 Year Projection Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	tion R	esu	lts Sun	nmary	,						
General Information										Intersection Information					7450181		
Agency									Duration, h 1.000				_	• • • •			
Analyst					Analysis Date 2/15/20				024 Area Type			г	4				
Jurisdiction			Time Period			PHF		1.00			4.7						
Urban Street John F Kennedy				Analys	sis Yea	r 2024	4 Analysis			Period 1> 12:00			7				
Intersection 12-1pm Penn/JFK				File Name		TUES			ction (Penn-JFK		()_10YEARproje			ጎተተ			
Project Descrip	tion								-				-	4.44	7 1		
Demand Inform	nation				EB			W	P		NB			SB			
Demand Information				L	T	R	L	T 7		L	T	R	+-	T	R		
Approach Movement			_	-	_	-	_	_	-	-	_	-	_	_			
Demand (v), veh/h				183	218	116	88	18	98	140	717	99	107	621	192		
Signal Informa	tion				Ţ	\top		T ₂		1 2	닐.				A		
Cycle, s	74.9	Reference Phase	2		5	51	al 51	2Ľ	Æ	Ħ	ė"	<u>۲</u> ۴	_	- ∕` ,∣	~		
Offset, s	116	Reference Point	End	Green	6.1	0.7	24.3	5.9	9 2.1	15.0		-	2	3			
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	-	0.0	4.0	4.0		4.0			SŽ2	/	7		
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2		1.2		- 6	Yo	7	4		
T: D						FDT	Luc		WBT	NE		NET	SBI		0.0.7		
Timer Results			EBI	-	EBT								-	SBT			
Assigned Phase			3	-	8	7	4		1		6 5		2				
Case Number				1.1		4.0	1.1			1.1		4.0 1.1					
Phase Duration, s				13.2		22.3			20.2	12.0	$\overline{}$	30.1	11.3	-	29.4		
Change Period, (Y+Rc), s				5.2		5.2	5.2		5.2	5.2	_	5.1 5.2					
Max Allow Headway (MAH), s						3.1	3.1		3.1	3.1		3.1	3.1		3.1		
Queue Clearance Time (g s), s				8.0		15.7	4.8		8.5 6.5		20.9		4.5		15.6		
Green Extension Time (g e), s				0.1		1.2	0.1		1.2	0.3	0.3 3.9		0.2		3.9		
Phase Call Probability			0.98	3	1.00	1.00 0.84		1.00	0.97	0.97 1.0		0.87		1.00			
Max Out Probability				1.00 0		0.00	0.00		0.00	0.00		0.00	0.00)	0.00		
Movement Group Results				EB			WE	3		NB			SB				
Approach Movement			L	Т	R	L	Т	R	L	Т	R	L	Т	R			
Assigned Movement			3	8	18	7	4	14	1	6	16	5	2	12			
Adjusted Flow Rate (v), veh/h			183	334	10	88	181		170	507	486	99	391	360			
Adjusted Flow Rate (v), Veli/III Adjusted Saturation Flow Rate (s), veh/h/ln			1767	1746		1767	185		1838	1856	1776	1838	1856	1705			
Queue Service Time (g s), s			6.0	13.7		2.8	6.5		4.5	18.9	18.9	2.5	13.6	13.6			
Cycle Queue Clearance Time (g c), s			6.0	13.7		2.8	6.5	_	4.5	18.9	18.9	2.5	13.6	13.6			
Green Ratio (g/C)			0.31	0.23		0.28	0.20		0.42	0.33	0.33	0.41	0.32	0.32			
Capacity (c), v				426	401		258	373		371	621	595	281	604	555		
Volume-to-Capacity Ratio (X)				0.430	0.833		0.341	0.48	_	0.460	0.816	0.816	0.352	0.647	0.649		
Back of Queue (Q), ft/ln (95 th percentile)				108	242		52	128		80	288	271	45	221	203		
					-		-	-						-	-		
Back of Queue (Q), veh/ln (95 th percentile)				4.2	9.5		2.0	5.0		3.1	11.2	10.8	1.8	8.6	8.1		
Queue Storage Ratio (RQ) (95 th percentile)				0.59	0.00		0.45	0.00		0.79	0.00	0.00	0.38	0.00	0.00		
Uniform Delay (d 1), s/veh Incremental Delay (d 2), s/veh			20.4	27.7		21.9	26.7	-	15.7 0.2	0.6	0.7	17.2 0.2	21.7	21.7			
Initial Queue Delay (d s), s/veh			0.3	0.0		0.3	0.4		0.2	0.0	0.7	0.2	0.3	0.3			
Control Delay (d), s/veh					-		-	—			-	_			-		
				20.7	29.5		22.2	27.0		15.9	23.6	23.6	17.4	22.0	22.1		
Level of Service (LOS)			C	C	_	C	C	C	В	С	C	В	C	C			
Approach Delay, s/veh / LOS				26.3 C			25.6 C			22.5 C			21.5 C				
Intersection Delay, s/veh / LOS				23.3									С				
Multimodal Results				EB		l w		3			NB		SB				
Pedestrian LOS Score / LOS				2.28	_	В	2.28		В	2.10	_	В	1.91		В		
					-		-	_			-			-			
Bicycle LOS Score / LOS				1.34		Α	1.09	9	Α	1.28		Α	1.25)	Α		

Table 1851. Pennsylvania Ave and JFK Rd Tuesday Noon-1PM HCS 20 Year Projection Conditions

		HCS	Sigr	nalize	d Int	ersect	ion R	esul	ts Sun	nmary	,				
0	4:									· 1-6	4			4	K II
General Inform	nation							\rightarrow	Intersec		1		- 6	4.4	
Agency								\rightarrow	Duration		1.000		- 3		
Analyst						e 2/15/	2024	\rightarrow	Area Typ	е	Other		- 1		•
Jurisdiction				Time F					PHF		1.00		_ 		÷
Urban Street		John F Kennedy		Analys	sis Yea	r 2024			Analysis	Period	1> 12	::00	7		
Intersection		12-1pm Penn/JFK		File Na	ame	TUES	DAY Int	tersect	ion (Peni	n-JFK)_	20YEAI	Rproje		111	
Project Descrip	tion												7	4.44	RIT
Demand Inforn	nation				EB			WE	2		NB			SB	
Approach Move				L	T	R	1	T	R	1	T	T R	1	T	T R
				203	240	_	98	20	_	-	+	_	-	<u> </u>	-
Demand (v), v	en/n			203	240	120	90	20	0 109	155	792	110	118	685	21
Signal Informa	tion				ΤŢ	$\overline{}$		\top	$\overline{}$	$\overline{}$	5				
Cycle, s	79.3	Reference Phase	2	1	"	54		2 H	4	ĸ	§		P _	∠	7
Offset, s	0	Reference Point	End		()	<u></u>			3			1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Green	_	0.0	25.6 4.0	6.2 4.0		16.3 4.0	<u>-</u> [rt-	_	
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2		1.2		5	Y.	7	➾
. Stoc Mode		Canan. Oup 1470	JII												
Timer Results				EBI		EBT	WB	L	WBT	NBI		NBT	SBI		SBT
Assigned Phase	е			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	, s			14.4	1	24.5	11.4	4	21.5	12.7		31.8	11.6		30.7
Change Period,	(Y+R	c), S		5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Head	x Allow Headway (MAH), s			3.1		3.1	3.1		3.1	3.1		3.1	3.1		3.1
Queue Clearan	ue Clearance Time (g s), s			9.0		18.0	5.3		9.6	7.3		24.7	5.0		18.4
Green Extensio	eue Clearance Time (g s), s en Extension Time (g e), s			0.3		1.2	0.1	\neg	1.3	0.3		1.9	0.1		0.0
Phase Call Proi				0.99		1.00	0.88	3	1.00	0.98		1.00	0.91		1.00
Max Out Proba				0.00		0.00	0.00	0	0.00	0.00		0.40	0.00		1.00
Movement Gro	•	sults			EB	_		WB	_		NB	_		SB	_
Approach Move				L	Т	R	L	T	R	L	T	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow I	Rate (v), veh/h		203	368		98	200	109	188	559	536	109	432	39
		ow Rate (s), veh/h/l	n	1767	1746	-	1767	1856	1111	1838	1856	1776	1838	1856	170
Queue Service				7.0	16.0	-	3.3	7.6	4.7	5.3	22.7	22.7	3.0	16.3	16.
Cycle Queue C		e Tíme (gε), s		7.0	16.0	-	3.3	7.6	4.7	5.3	22.7	22.7	3.0	16.3	16.
Green Ratio (g				0.32	0.24		0.28	0.21	_	0.42	0.34	0.34	0.40	0.32	0.3
Capacity (c), v				425	426		246	382	324	344	626	599	252	599	55
Volume-to-Capa				0.478	0.864	-	0.399	0.523		0.547	0.894	0.895	0.433	0.722	0.72
		t/In (95 th percentile		127	278		62	151	78	95	357	337	54	267	24
		eh/ln (95 th percenti		4.9	10.8	_	2.4	5.9	3.1	3.7	13.9	13.5	2.1	10.4	9.8
		RQ) (95 th percent	iie)	0.70	0.00	-	0.54	0.00	_	0.95	0.00	0.00	0.45	0.00	0.0
Uniform Delay (Incremental De				0.3	28.8	-	0.4	28.1 0.4	26.9 0.2	17.3 0.3	25.0 5.5	25.0 5.8	19.1	23.8	23.
Incremental De Initial Queue De		77		0.0	0.0		0.4	0.4	0.2	0.0	0.0	0.0	0.3	0.0	0.0
				21.4	31.3		23.5	28.5		17.6	30.5	30.8	19.3	26.1	26.
Control Delay (Level of Service				C C	0 C		C 23.5	20.5 C	C C	B	00.5 C	0.6 C	19.3 B	20.1	20. C
Approach Delay				27.8		C	26.9	_	C	28.7		C	25.4		-
				27.0	,		7.3	9	U	20.1			25.4 C		0
microculon De	rsection Delay, s/veh / LOS						J								
Multimodal Re	timodal Results							WB			NB			SB	
Pedestrian LOS		/LOS		2.28	EB	В	2.29	_	В	2.10	_	В	1.91	_	В
Bicycle LOS Sc				1.43	-	A	1.10	-	A	1.36	-	A	1.32	-	A

Table 1952. Pennsylvania Ave and JFK Rd Tuesday Noon-1PM HCS 20 Year Projection Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	tion R	esul	ts Sun	nmary	,				
General Inform	nation								Intersec	tion Inf	ormatic	on		4	Ja la
Agency									Duration	h	1.000			4.6	
Analyst				Analys	sis Dat	e 2/15/2	2024		Area Typ	е	Other		4		
Jurisdiction				Time F	eriod				PHF		1.00		4		
Urban Street		John F Kennedy		Analys	sis Yea	r 2024		\neg	Analysis	Period	1> 12	:00	7		
Intersection		12-1pm Penn/JFK		File Na	ame	TUES	SDAY Int	tersect	tion (Peni	n-JFK)_	20YEAI	Rproje		516	
Project Descrip	tion												7	4.44	7 4
									_	_					
Demand Inforr					EB			W		-	NB		-	SB	
Approach Move				L	T	R	L	T	_	L	T	R	L	T	R
Demand (v), v	eh/h		_	203	240	128	98	20	0 109	155	792	110	118	685	212
Signal Informa	ation				ΤŢ						2				ĸ
Cycle, s	83.8	Reference Phase	2	1	2				43	R	F .		<u> </u>	⋰ │	↔
Offset, s	56	Reference Point	End		1				S	_		1	2	3	4
Uncoordinated	Yes	Simult. Gap E/W	On	Green		0.9	29.2	6.3		16.6	<u> </u>		-4-	_	_
Force Mode	Fixed	Simult. Gap N/S	On	Yellow Red	1.2	0.0	1.1	1.2		1.2		1	Y	7	- ♦ ,
1 SICC MODE	Tixeu	Cantuit. Gap 14/3	Oll	, tou	1.2	J.0	11.1	1.2	10.0	1.2					
Timer Results				EBI		EBT	WB	L	WBT	NBI		NBT	SBI		SBT
Assigned Phase	e			3		8	7	\neg	4	1		6	5		2
Case Number				1.1	\neg	4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	1. S			15.0	,	25.3	11.5	5	21.8	12.6	5	35.2	11.7	,	34.3
Change Period	. (Y+R	c), s		5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Head				3.1	$\overline{}$	3.1	3.1		3.1	3.1		3.1	3.1	$\overline{}$	3.1
Queue Clearan				9.4		19.1	5.6		10.2	7.4		25.3	5.1	-	18.7
Green Extension				0.4	\neg	0.7	0.1		0.0	0.0		4.5	0.2		4.3
Phase Call Pro		(0-71-		0.99	-	1.00	0.90	0	1.00	0.99		1.00	0.92	2	1.00
Max Out Proba				0.00	,	0.00	0.0	0	1.00	1.00		0.00	0.00		0.06
Movement Gro		sults			EB	_		WB	_		NB			SB	
Approach Move				L	T	R	L	T	R	L	T	R	L	Т	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow I				203	368	_	98	200		188	559	536	109	432	398
		ow Rate (s), veh/h/l	n	1767	1746		1767	1856		1838	1856	1776	1838	1856	1704
Queue Service				7.4	17.1	-	3.6	8.2	5.0	5.4	23.3	23.3	3.1	16.7	16.7
		e Time (gε), s		7.4	17.1		3.6	8.2	5.0	5.4	23.3	23.3	3.1	16.7	16.7
Green Ratio (g				0.32	0.24		0.28	0.20	_	0.44	0.36	0.36	0.43	0.35	0.35
Capacity (c), v		-E- /323		416	421		235	369	_	352	670	641	260	648	595
Volume-to-Cap				0.488	0.873		0.417	0.542	-	0.534	0.835	0.836	0.419	0.667	0.668
		t/ln (95 th percentile		137	294		68	166	_	99	346	326	56	264	241
		eh/ln (95 th percenti		5.3	11.5		2.6	6.5	3.3	3.9	13.5	13.0	2.2	10.3	9.6
		RQ) (95 th percent	ile)	0.75	0.00		0.59	0.00		0.99	0.00	0.00	0.47	0.00	0.00
Uniform Delay				22.5	30.8		25.1	30.4		17.1	24.7	24.7	19.1	23.3	23.3
Incremental De		**		0.3	2.3		0.4	0.9		0.4	0.6	0.7	0.3	0.3	0.3
Initial Queue De		•		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (22.8	33.1		25.5	31.3		17.5	25.3	25.4	19.4	23.6	23.6
Level of Service				C	C		C	C	C	В	C	С	В	С	C
Approach Delay				29.5)	С	29.4	4	С	24.2	2	С	23.1		С
Intersection De	iay, s/ve	eh / LOS				2	5.5						С		
Multimodal Re	eulte				EB			WB			NB			SB	
Pedestrian LOS		/108		2.28	_	В	2.29	_	В	2.10	_	В	1.91	_	В
					-		-	_		-	-		1.32	-	
Bicycle LOS So	JOIE / LC	J3		1.43	,	Α	1.10	U	Α	1.36	,	Α	1.54	-	Α

Table 2053. Wacker Dr and JFK Rd Tuesday Noon-1PM HCS 5 Year Projected Conditions

		HCS	Sigr	nalize	d Inte	rsect	ion R	esu	lts Sun	nmary	,				
Company									luta	4: !				414	with
General Inform	nation								Intersec		_		- i	4741	2 4
Agency						la re e c			Duration		1.000		24		
Analyst						2/20/2	024		Area Typ	oe	Other				
Jurisdiction				Time F					PHF		1.00		<u>-</u>		+
Urban Street		Wacker/JFK		-	is Year				Analysis		1> 7:0		- 2		
Intersection		Wacker/JFK NOON		File Na	ame	TUES	DAY Int	ersec	tion (Wad	ker-JFK	()_5YE	ARproj		117	
Project Descrip	tion	Wacker/JFK TUESI	DAY	_	_	_	_	_		_	_	_		4144	N)f
Demand Inform	nation				EB			W	/B	$\overline{}$	NB			SB	
Approach Move	ement			L	T	R	L	Т.	r R	L	T	R	L	T	R
Demand (v), v	eh/h			378	3	67	4	!	5 5	83	537	5	14	444	22
Signal Informa		Deference Dhane	_		1 6		21/3	L	Ħ		Ų		кtя		я
Cycle, s	55.2	Reference Phase	2		5	517	"I "∭	"₿	E			1	2	3	❤
Offset, s	0 Voc	Reference Point	End	Green		4.3	16.6	10		0.0					4
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	3.		0.0		\	_	<i>-</i>	Z
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.	5 2.5	0.0		6	0	7	
Timer Results				EBI		EBT	WBI		WBT	NBI		NBT	SBI		SBT
Assigned Phase	e					4			8	5		2	1		6
Case Number						10.0			12.0	1.1		4.0	1.1		4.0
Phase Duration	, S					16.2			6.7	10.3	3	26.4	6.0		22.1
Change Period,	(Y+R	c), S				5.5		\neg	5.5	5.0		5.5	5.0		5.5
Max Allow Head	ax Allow Headway (MAH), s					3.3		\neg	3.2	3.1		3.1	3.1		3.1
Queue Clearan	eue Clearance Time (g s), s					9.7			2.2	5.4		16.7	2.3		10.9
	eue Clearance Time (g s), s een Extension Time (g e), s					0.9			0.0	0.2		4.0	0.0		4.0
Phase Call Prol	bability					1.00			0.19	0.93	3	1.00	0.19	9	1.00
Max Out Probal	bility					0.00		1	0.00	0.00		0.00	0.00		0.00
Movement Gro	un Res	sults			EB			W	3		NB			SB	
Approach Move		ruits		L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow F) veh/h		189	259	17	7	-	7	174	569	567	14	352	316
		ow Rate (s), veh/h/l	n	1810	1759		1850		1674	1810	1900	1894	1810	1900	168
Queue Service				5.2	7.7		0.2		0.2	3.4	14.7	14.7	0.3	8.8	8.9
Cycle Queue C				5.2	7.7		0.2		0.2	3.4	14.7	14.7	0.3	8.8	8.9
Green Ratio (g		S. Allo (gt.), S		0.19	0.19		0.02		0.02	0.42	0.38	0.38	0.32	0.30	0.30
Capacity (c), v				350	340		39		36	414	720	718	202	573	508
Volume-to-Capa		rtio (X)		0.540	0.761		0.186		0.186	0.420	0.789	0.789	0.069	0.615	0.62
		t/In (95 th percentile	:)	90	133		4		4	51	201	201	5	151	136
	3 - 77	eh/ln (95 th percenti	•	3.6	5.3		0.2		0.2	2.0	8.1	8.0	0.2	6.0	5.5
		RQ) (95 th percent		0.18	0.27		0.10		0.09	0.26	0.40	0.40	0.08	0.30	0.2
Uniform Delay ((d1), s	/veh		20.1	21.1		26.6		26.6	11.5	15.2	15.2	14.3	16.6	16.
Incremental De	lay (d a), s/veh		0.5	1.3		8.0		0.9	0.1	0.4	0.4	0.1	0.4	0.5
Initial Queue De	elay (d	з), s/veh		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (20.6	22.5		27.5		27.6	11.6	15.6	15.6	14.4	17.0	17.1
Level of Service				С	С		С		С	В	В	В	В	В	В
Approach Delay	, s/veh	/LOS		21.7	7	С	27.5		С	15.1		В	17.0)	В
Intersection Del	lay, s/ve	eh / LOS				16	5.9						В		
Multime and a L. C.															
Multimodal Re Pedestrian LOS		/1.00		2.29	EB	В	2.29	WI	в В	1.89	NB	В	2.09	SB	В

Table 2154. Wacker Dr and JFK Rd Tuesday Noon-1PM HCS 5 Year Projected Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	ion R	esu	lts Su	mmar	У				
General Inforn	nation								Interse	ction Ir	formati	on	l di	down	JA TU
Agency									Duratio	n, h	1.000)		4.4	
Analyst				Analys	sis Date	2/20/2	2024		Area T	/ре	Othe	г	4		
Jurisdiction				Time F					PHF		1.00		2 -		A.
Urban Street		Wacker/JFK		Analys	sis Year	2024			Analys	s Period	1> 7:	00	7		
Intersection		Wacker/JFK NOON	-1PM	File N		-	DAY Int	erse	ction (Wa			ARproi	-		
Project Descrip	tion	Wacker/JFK TUESI		1		1.020	2 711 1111		J		,_5			4 - 47	计作
. Tojout Dossiip		Tradical R Tozol													
Demand Inform	nation				EB		$\overline{}$	V	VB	$\overline{}$	NB		$\overline{}$	SB	
Approach Move	ement			L	Т	R	1	Т	TR	1	Т	T R		Т	R
Demand (v), v				378	3	67	4		5 5	83	537	5	14	444	224
Belliana (v), v	OIIIII			310			_				331		- 11	111	
Signal Informa	ition				T U	$\overline{}$	IJ.	$\overline{}$	<u> </u>	$\overline{}$					
Cycle, s	54.9	Reference Phase	2	1	°	E.A.		"E	: 月			>	₩		
Offset, s	0	Reference Point	End		()	50		T				1	2	3	A
Uncoordinated	Yes	Simult. Gap E/W	On	Green		0.0	16.5 4.0	3.	0.6 1.2	_				7	→
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.				5	0	7	
T OTCC MIOGC	Tixeu	Ollifatt. Oup 14/0	Oil	1100	1.0		1.0		, , ,			•			
Timer Results				EBI		EBT	WB		WBT	N	RI .	NBT	SBI		SBT
Assigned Phase					-	4	****	-	8	1 5	-	2	1	_	6
Case Number	e			_	_	10.0	_	-	12.0	1.	-	4.0	1.1	_	4.0
				-	-		-	-		10	_	26.2	6.0	-	22.0
Phase Duration	•	\ -		\vdash	-	16.1	_	-	6.7	_	_			-	
Change Period		**		_	-	5.5	-	-	5.5	5.	_	5.5	5.0	_	5.5
Max Allow Hea				_	_	3.3	_	_	3.2	3.	_	3.1	3.1	-	3.1
Queue Clearan	ce Time	e (gs), s			_	9.7		_	2.2	5.	-	16.5	2.3	-	10.9
Green Extension	n Time	(ge), s			_	0.9		_	0.0	0.	0	4.0	0.0		4.0
Phase Call Pro	bability					1.00		_	0.19	0.9	3	1.00	0.19	9	1.00
Max Out Proba	bility					0.00			0.00	1.0	0	0.00	0.03	3	0.00
Movement Gro	un Das	nulte			EB			W	R	_	NB			SB	
Approach Move	-	Juito		L	T	R	L	Т		1	T	R	1	T	R
				7	4	14	3	8	_	5	2	12	_	_	-
Assigned Move		t. /t.			_	14	7	-		-	-	_	1	6	16
Adjusted Flow I			_	189	259			-	7	172	564	562	14	352	316
		ow Rate (s), veh/h/l	n	1810	1759		1850	-	1674	_	-	1894	1810	1900	1685
Queue Service				5.2	7.7		0.2	_	0.2	3.4	14.5	14.5	0.3	8.8	8.9
-		e Time (gε), s		5.2	7.7		0.2		0.2	3.4	14.5	14.5	0.3	8.8	8.9
Green Ratio (g				0.19	0.19		0.02		0.02	-		0.38	0.32	0.30	0.30
Capacity (c), v				350	340		40		36	412	717	715	203	575	510
Volume-to-Cap				0.540	0.762		0.186		0.18	-	-	0.785	0.069	0.613	0.620
Back of Queue	(Q), f	t/ln (95 th percentile)	90	132		4		4	50	198	198	5	150	135
Back of Queue	(Q), ve	eh/ln (95 th percenti	le)	3.6	5.3		0.2		0.2	2.0	7.9	7.9	0.2	6.0	5.4
Queue Storage	Ratio (RQ) (95 th percent	tile)	0.18	0.26		0.10		0.09	0.26	0.40	0.40	0.08	0.30	0.27
Uniform Delay	(d1), s	/veh		20.0	21.0		26.5		26.5	11.5	15.2	15.2	14.3	16.5	16.5
Incremental De	lay (d a), s/veh		0.5	1.4		0.8		0.9	0.1	0.4	0.4	0.1	0.4	0.5
Initial Queue De	elay (d	3), s/veh		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/ve	eh		20.5	22.4		27.3		27.4	11.7	15.6	15.6	14.3	16.9	17.0
Level of Service	e (LOS)			С	С		С		С	В	В	В	В	В	В
Approach Delay				21.6	_	С	27.4		С	15	.0	В	16.9		В
Intersection De							5.8						В		
													_		
Multimodal Re	sults				EB			W	В		NB			SB	
Pedestrian LOS		/LOS		2.29	_	В	2.29	$\overline{}$	В	1.8	_	В	2.09	_	В
Bicycle LOS So				1.23	-	A	0.50	\rightarrow	A	1.0	-	A	1.05	-	A
, 0.0 _00 00				1.2			0.50			100	-		1.00		

Table 2255. Wacker Dr and JFK Rd Tuesday Noon-1PM HCS 10 Year Projected Conditions

		HCS	Sigr	nalize	d Int	ersect	tion R	esu	ılts Su	mmar	у				
General Inform	nation								Interse	ction In	formati	on	- i	4.4	34 L
Agency									Duratio	n, h	1.000)	_		
Analyst				Analys	sis Dat	e 2/20/:	2024		Area T	уре	Othe	г	4		
Jurisdiction				Time F	Period				PHF		1.00		4 -		**
Urban Street		Wacker/JFK		Analys	sis Yea	r 2024			Analys	is Period	1> 7:	00	7		
Intersection		Wacker/JFK NOON	-1PM	File N	ame	TUES	DAY Int	erse	ction (W	acker-JF	K)_10YE	ARpr		315	
Project Descrip	tion	Wacker/JFK TUESI	OAY										7	4.44	を作
Demand Inform	nation				EB			٧	VB		NB			SB	
Approach Move	ement			L	Т	R	L	Т	T F	L	T	R	L	Т	R
Demand (v), v	eh/h			397	3	70	4		6 5	87	564	6	14	466	23
Cianal Informa	tion						1 11:	-	- 1						
Signal Informa		Deference Dhase	2	1	1 %		215	L	? Ħ		Į		SŤZ		,
Cycle, s	57.2	Reference Phase	2		5	151	7 M	"F	3 -			1	2	3	\Rightarrow
Offset, s	0	Reference Point	End	Green	-	4.5	17.5	_	1.4 1.						حَ
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	-	0.0	4.0	3.				\ \<	<u> </u>		7
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.	.5 2.	5 0.0	_	6	0	7	
Timer Results				EBI		EBT	WBI		WBT	NE	BL	NBT	SBI		SBT
Assigned Phase	e					4			8	5	_	2	1		6
Case Number						10.0			12.0	1.	-	4.0	1.1		4.0
Phase Duration					_	16.9			6.8	10	-	27.5	6.0	_	23.0
Change Period	, -	c) s		_	_	5.5			5.5	5.	_	5.5	5.0	-	5.5
Max Allow Head				_	_	3.3	_	-	3.2	3.	_	3.1	3.1	_	3.1
Queue Clearan					_	10.4			2.2	5.	-	17.6	2.3	-	11.7
Green Extension				_	_	0.9		_	0.0	0.	_	4.2	0.0	_	4.3
Phase Call Pro		(ge), s		_		1.00			0.21	0.9	_	1.00	0.20	-	1.00
Max Out Proba					_	0.00		-	0.00	0.0	_	0.00	0.00	_	0.00
Max Out 1 1000	Dility					0.00			0.00	0.0		0.00	0.00		0.00
Movement Gro	oup Res	sults			EB			W			NB			SB	_
Approach Move	ement			L	Т	R	L		R	L	T	R	L	T	R
Assigned Move	ment			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow I	Rate (v), veh/h		199	272		8		7	178	583	581	14	370	331
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1810	1759		1853		168	7 1810	1900	1893	1810	1900	168
Queue Service	Time (g s), S		5.7	8.4		0.2		0.2	3.6	15.6	15.6	0.3	9.6	9.7
Cycle Queue C	learanc	e Time (gε), s		5.7	8.4		0.2		0.2	3.6	15.6	15.6	0.3	9.6	9.7
Green Ratio (g	/C)			0.20	0.20		0.02		0.02		0.38	0.38	0.33	0.31	0.31
Capacity (c), v	/eh/h			361	351	_	42		38	405	733	730	197	584	518
Volume-to-Cap	acity Ra	atio (X)		0.550	0.773		0.188		0.18	7 0.438	0.796	0.796	0.071	0.633	0.63
Back of Queue	(Q), f	t/ln (95 th percentile)	99	146		5		4	54	212	212	5	167	150
Back of Queue	(Q), v	eh/ln (95 th percenti	le)	4.0	5.8		0.2		0.2	2.1	8.5	8.5	0.2	6.7	6.0
Queue Storage	Ratio (RQ) (95 th percent	ile)	0.20	0.29		0.11		0.10	0.27	0.42	0.42	0.08	0.33	0.30
Uniform Delay	(d1), s	/veh		20.7	21.7		27.5		27.5	11.8	15.6	15.6	14.7	17.1	17.1
Incremental De	lay (d a), s/veh		0.5	1.4		8.0		0.9	0.1	0.4	0.4	0.1	0.4	0.5
Initial Queue De	elay (d	₃), s/veh		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/v	eh		21.1	23.1		28.3		28.4	11.9	16.0	16.0	14.8	17.5	17.6
Level of Service	e (LOS)			С	С		С		С	В	В	В	В	В	В
Approach Delay	y, s/veh	/LOS		22.3	3	С	28.4		C	15	.5	В	17.5	5	В
						1	7.4						В		
	ection Delay, s/veh / LOS														
Multimodal Re		// 00			EB	_		W			NB	_		SB	_
Pedestrian LOS				2.29	-	В	2.29	\rightarrow	В	1.8	-	В	2.09	-	В
Bicycle LOS Sc	ore / L(JS		1.26	0	Α	0.50	,	Α	1.0	3	Α	1.08	5	Α

Table 2356. Wacker Dr and JFK Rd Tuesday Noon-1PM HCS 10 Year Projected Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	tion R	esu	ılts Sı	um	mary	,				
General Inforn	nation								Inters	ecti	ion Info	ormatic	n		4-01	N L
Agency									Durati	on,	h	1.000		-		
Analyst				Analys	sis Date	e 2/20/2	2024		Area 1	Гуре	,	Other		4		
Jurisdiction				Time F	Period				PHF			1.00		3.4		÷
Urban Street		Wacker/JFK		Analys	sis Yea	r 2024			Analys	sis F	Period	1> 7:0	00	7		
Intersection		Wacker/JFK NOON	-1PM	File N	ame	TUES	DAY Int	erse	ction (W	/ack	er-JFK	_10YE	ARpr		516	
Project Descrip	tion	Wacker/JFK TUESI	DAY											- 1	4.44	ir if
Demand Inform	nation				EB		\top	٧	VB			NB		\top	SB	
Approach Move	ement			L	Т	R	L	Т	TI	R	L	Т	R	L	Т	R
Demand (v), v	eh/h			397	3	70	4		6	5	87	564	6	14	466	235
Signal Informa	tion						IJ.	7	2			7				
Cycle, s	56.7	Reference Phase	2	1	7			Ŀ	[]					SZ		7
Offset, s	0	Reference Point	End		15	<u></u>							1	2	3	Z
-	_			Green	-	4.0	17.6	-		.3	0.0					4
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	_		.0	0.0		7.4		_^ │	~
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2	.5 2	.5	0.0	-	6	0	7	
Timer Results				EBI		EBT	WB	L	WBT	П	NBL	$\overline{}$	NBT	SBI		SBT
Assigned Phas	e					4		\neg	8	\neg	5		2	1		6
Case Number						10.0			12.0		1.1		4.0	1.1		4.0
Phase Duration	1. S				-	16.8			6.8	7	10.0		27.1	6.0	-	23.1
Change Period		c). s			\rightarrow	5.5			5.5		5.0		5.5	5.0		5.5
Max Allow Hea		•				3.3			3.2	-	3.1		3.1	3.1	_	3.1
Queue Clearan		**		_	_	10.3	_		2.2	-	5.6		17.3	2.3	-	11.6
Green Extension				_	_	0.9	_		0.0	-	0.0	_	4.2	0.0	_	4.2
Phase Call Pro		(ge), s		_	_	1.00			0.21	-	0.94		1.00	0.20	-	1.00
				_	-	0.00	-		0.21	-	1.00	-	0.01	0.20	_	0.00
Max Out Proba	Dility				-	0.00			0.00		1.00		0.01	0.00		0.00
Movement Gro	oup Res	sults			EB			W	В	\Box		NB			SB	
Approach Move	ement			L	T	R	L	Т	R		L	Т	R	L	Т	R
Assigned Move	ment			7	4	14	3	8	18	3	5	2	12	1	6	16
Adjusted Flow	Rate (v), veh/h		199	272		8		7		175	576	574	14	370	331
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1810	1759		1853		168	37	1810	1900	1893	1810	1900	1685
Queue Service	Time (g s), s		5.6	8.3		0.2		0.2	2	3.6	15.3	15.3	0.3	9.5	9.6
Cycle Queue C	learanc	e Time (g c), s		5.6	8.3		0.2		0.2	2	3.6	15.3	15.3	0.3	9.5	9.6
Green Ratio (g	/C)			0.20	0.20		0.02		0.0	2	0.42	0.38	0.38	0.33	0.31	0.31
Capacity (c), v	/eh/h			361	351		42		38	3	398	727	724	197	594	526
Volume-to-Cap		atio (X)		0.550	0.774		0.188		0.18	88	0.441	0.792	0.792	0.071	0.623	0.629
		t/ln (95 th percentile)	98	144		5		4	-	54	208	208	5	164	147
		eh/ln (95 th percenti		3.9	5.8		0.2		0.2	\rightarrow	2.2	8.3	8.3	0.2	6.5	5.9
		RQ) (95 th percent		0.20	0.29		0.11		0.1	-	0.28	0.42	0.42	0.08	0.33	0.29
Uniform Delay			no,	20.5	21.6		27.3		27.	-	11.9	15.6	15.6	14.5	16.7	16.7
Incremental De				0.5	1.4		0.8		0.9	-	0.1	0.4	0.4	0.1	0.4	0.5
Initial Queue D				0.0	0.0		0.0		0.0	\rightarrow	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (21.0	23.0		28.1		28.	\rightarrow	12.1	15.9	16.0	14.5	17.1	17.2
				C C	23.0 C		C C		20. C	\rightarrow	B	15.9 B	10.0 B	B	B	17.2 B
Level of Service					_					-						
Approach Delay				22.1		С	28.2		С	-	15.4		В	17.1		В
Intersection De	iay, s/ve	en / LOS				1	7.2							В		
Multimodal Re	sults				EB			W	В			NB			SB	
Pedestrian LOS		/LOS		2.29	_	В	2.29	$\overline{}$	В	7	1.89	_	В	2.09	_	В
Bicycle LOS So				1.26	-	A	0.50	\rightarrow	A	1	1.03	-	A	1.08	-	A
, 0.0 _00 00				1.21							4.00			1.00		

Table 2457. Wacker Dr and JFK Rd Tuesday Noon-1PM HCS 20 Year Projected Conditions

		HCS	Siar	nalize	d Int	ersec	tion R	esu	ılts Sur	nmar	,				
General Inform	nation								Interse	ction Inf	ormatio	on	Į,	Albert.	je i U
Agency									Duration	ı, h	1.000	1		4.1	B.,
Analyst				Analys	is Dat	e 2/20/	2024		Area Ty	ре	Other		1		
Jurisdiction				Time F	eriod				PHF		1.00		3 4		<u> </u>
Urban Street		Wacker/JFK		Analys	sis Yea	r 2024			Analysis	Period	1> 7:0	00			
Intersection		Wacker/JFK NOON	-1PM	File Na			SDAY Int	erse	ction (Wa		() 20YE	ARpr	-	* + *	r (
Project Descrip	tion	Wacker/JFK TUESI	DAY								/_		- 4	4147	2- (
,															
Demand Inform	nation				EB		\top	٧	VB	\top	NB		\top	SB	
Approach Move	ement			L	T	R	L	Т	T R	L	T	R	L	Т	R
Demand (v), v	eh/h			439	4	78	5		6 6	96	623	6	16	515	260
Signal Informa	_	I =			7		245	Ŀ	, 🗏		Į		-t-		
Cycle, s	64.9	Reference Phase	2		5	51	z 50	٦F	, E			1	2	3	- ♦ ₄
Offset, s	0	Reference Point	End	Green	1.3	0.1	21.7		3.8 1.6	0.0					<u></u>
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		3.5	4.0	3.		0.0			<u> </u>	⋰	7
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	1.5	1.5	2.	5 2.5	0.0		6	0	7	8
Timer Results				EBI		EBT	WB		WBT	NB		NBT	SBI		SBT
				EDI	-	4	VVB	-	8	5	_	2	1	-	6
Assigned Phas	e			_	-	10.0	-	-		1.1	_	4.0		_	4.0
Case Number				_	-		-	-	12.0	-	-		1.1	-	
Phase Duration		١.٥		_	-	19.3 5.5	-	-	7.1	11.3 5.0	_	32.3 5.5	6.3 5.0	_	27.2 5.5
Change Period				-	-		-	-	5.5	_	_	3.1	_	_	3.1
Max Allow Hea				_	-	3.3	-		3.2	3.1	-		3.1 2.4	-	
Queue Clearan				_	-	12.6	-	-	2.3	6.2		21.6		-	14.0
Green Extension		(g e), S		⊢	-	1.0	-	-	0.0	0.2	\rightarrow	4.9	0.0	$\overline{}$	5.0
Phase Call Pro				-	-	1.00	-	-	0.27	0.9	-	1.00	0.25	_	1.00
Max Out Proba	DIIILY				-	0.00			0.00	0.0	,	0.01	0.00	_	0.00
Movement Gro	oup Res	sults			EB		$\overline{}$	W	В	$\overline{}$	NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	T	R	L	Т	R
Assigned Move	ment			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow I	Rate (v), veh/h		220	302		9		8	196	643	641	16	410	365
		ow Rate (s), veh/h/l	n	1810	1759		1848		1676	1810	1900	1893	1810	1900	1684
Queue Service				7.1	10.6		0.3		0.3	4.2	19.6	19.6	0.4	11.9	12.0
Cycle Queue C				7.1	10.6	_	0.3		0.3	4.2	19.6	19.6	0.4	11.9	12.0
Green Ratio (g		(3)/		0.21	0.21		0.02		0.02	0.47	0.41	0.41	0.36	0.33	0.33
Capacity (c), v				385	374		46		42	397	786	783	182	637	565
Volume-to-Cap		rtio (X)		0.570	0.806	1	0.194		0.194		0.818	0.818	0.088	0.644	0.647
		t/In (95 th percentile)	128	190		6		6	66	256	255	6	208	191
	v - //	eh/ln (95 th percenti	,	5.1	7.6	_	0.3		0.2	2.6	10.2	10.2	0.3	8.3	7.6
		RQ) (95 th percent		0.26	0.38	+	0.14		0.13	0.34	0.51	0.51	0.10	0.42	0.38
Uniform Delay				23.0	24.4	_	31.2		31.2	12.5	17.0	17.0	15.9	18.4	18.4
Incremental De				0.5	1.6		0.8		0.8	0.1	0.3	0.3	0.1	0.4	0.5
Initial Queue D				0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (**		23.5	26.0		32.0		32.0	12.7	17.3	17.3	15.9	18.8	18.9
Level of Service				C	C		C		C	В	В	В	B	В	B
Approach Dela	<u> </u>			25.0		C	32.0		C	16.7		В	18.8		В
Intersection De				20.0			8.9		-	10.			В		
oroconon De	,														
Multimodal Re	sults				EB			W	В		NB			SB	
Pedestrian LOS	Score	/LOS		2.29)	В	2.30)	В	1.89	9	В	2.10)	В
Bicycle LOS So	core / LC	os		1.35	5 T	Α	0.50)	Α	1.09	9	Α	1.14	1	Α

Table 2558. Wacker Dr and JFK Rd Tuesday Noon-1PM HCS 20 Year Projected Conditions Optimized

		HCS	Sign	nalize	d Int	ersec	tion R	esi	ılts Su	mmar	у				
									la i						
General Inforn	nation								Interse	ction In			- i	440.	34 L
Agency									Duratio	n, h	1.000)			
Analyst				Analys	sis Dat	e 2/20/	2024		Area Ty	/pe	Other	r			
Jurisdiction				Time F	Period				PHF		1.00		₽ ₹		7
Urban Street		Wacker/JFK		Analys	sis Yea	r 2024			Analys	s Period	1> 7:	00			
Intersection		Wacker/JFK NOON	-1PM	File Na	ame	TUES	SDAY Int	erse	ction (Wa	cker-JF	K)_20YE	ARpr		515	
Project Descrip	tion	Wacker/JFK TUESI	DAY										- 7	4147	71
Demand Infor				_	EB	_	-	_ V	VB .		NB		-	SB	
Approach Move				L	T	R	L	\perp	T R	_	T	R	L	T	R
Demand (v), v	/eh/h			439	4	78	5	_	6 6	96	623	6	16	515	260
Signal Informa	ation				T I		[2][5	7	8						
Cycle, s	65.3	Reference Phase	2	1	2			Ŀ	2 月		,		SŽ2		А
Offset, s	00.5	Reference Point	End		15	1			Ši			1	2	3	Z
Uncoordinated	Yes		On	Green		3.7	23.3		3.9 1.6						4
		Simult. Gap E/W		Yellow	-	0.0	4.0		.0 3.0			<u>ነ</u> ፈ	,	_^_	Z
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2	.5 2.5	5 0.0		6	0	7	
Timer Results				EBI		EBT	l wb	L	WBT	NE	L	NBT	SBI		SBT
Assigned Phas						4			8	5	_	2	1		6
Case Number				_	_	10.0			12.0	1.1	-	4.0	1.1	_	4.0
Phase Duration	1.6				_	19.4	_		7.1	10.	-	32.5	6.3	-	28.8
Change Period	-, -	c) c			_	5.5	-		5.5	5.0	-	5.5	5.0	_	5.5
Max Allow Hea				_	_	3.3	_		3.2	3.	-	3.1	3.1	-	3.1
Queue Clearan					\rightarrow	12.7			2.3	6.4	_	21.7	2.4	-	13.7
Green Extension		· (3 - 11 -			_	1.0			0.0	0.0	_	5.0	0.0	$\overline{}$	5.0
Phase Call Pro		(3-7,-				1.00			0.27	0.9	-	1.00	0.25	$\overline{}$	1.00
Max Out Proba					_	0.00			0.00	1.0	_	0.00	0.00	\rightarrow	0.00
Movement Gro		sults			EB		_	W		-	NB			SB	
Approach Move				L	T	R	L			L	T	R	L	T	R
Assigned Move	ement			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow	Rate (v), veh/h		220	302		9		8	196	643	641	16	410	365
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1810	1759		1848		1676	1810	1900	1893	1810	1900	1684
Queue Service	Time (g s), S		7.2	10.7		0.3		0.3	4.4	19.7	19.7	0.4	11.6	11.7
Cycle Queue C	learanc	e Time (g c), s		7.2	10.7		0.3		0.3	4.4	19.7	19.7	0.4	11.6	11.7
Green Ratio (g	7/C)			0.21	0.21		0.02		0.02	0.45	0.41	0.41	0.38	0.36	0.36
Capacity (c), v	/eh/h			385	374		46		42	381	790	787	183	683	606
Volume-to-Cap	acity Ra	atio (X)		0.570	0.805	5	0.193		0.19	0.514	0.814	0.814	0.087	0.600	0.603
Back of Queue	(Q), f	t/ln (95 th percentile)	129	192		6		6	70	257	256	6	202	183
Back of Queue	(Q), v	eh/ln (95 th percenti	le)	5.2	7.7		0.3		0.2	2.8	10.3	10.3	0.2	8.1	7.3
		RQ) (95 th percent		0.26	0.38		0.14		0.13		0.51	0.51	0.10	0.40	0.37
Uniform Delay	(d 1), s	/veh		23.2	24.6		31.5		31.5	12.8	17.0	17.0	15.3	17.2	17.2
Incremental De				0.5	1.6		0.7		0.8	0.2	0.3	0.3	0.1	0.3	0.4
Initial Queue D				0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/v	eh		23.7	26.2		32.2		32.3	13.0	17.3	17.3	15.4	17.5	17.6
Level of Service	e (LOS)			С	С		С		С	В	В	В	В	В	В
Approach Dela				25.2		С	32.2	2	С	16.		В	17.5		В
Intersection De	•						8.6						В		
Multimodal Re	sults				EB			W	В		NB			SB	
Pedestrian LOS				2.29	_	В	2.30	\rightarrow	В	1.8	-	В	2.09	-	В
Bicycle LOS So	core / LO	OS		1.35	5	Α	0.50)	Α	1.0	9	Α	1.14	1	Α

Table 59. Pennsylvania Ave and JFK Rd Tuesday 11AM-Noon HCS Existing Conditions

		HCS	S Sigr	nalize	d Inte	ersect	ion R	esul	ts Sun	nmary	,				
Conoral Inform	ation								Interno	tion Inf				41.0.	KT.
General Inform	lation							\rightarrow	Intersec				- 6	1.1	
Agency						1014510		$\overline{}$	Duration,		1.000		-		-
Analyst						e 2/15/2	024	\rightarrow	Area Typ	е	Other				<u> </u>
Jurisdiction				Time F				\rightarrow	PHF		1.00		- E	***	;= <u>:</u>
Urban Street		John F Kennedy				r 2024			Analysis		1> 12		_5		
Intersection		11am-12pm Penn/J	FK	File Na	ame	TUES	DAY Int	ersect	ion (Peni	1-JFK)_	existing	.xus		* 1 3	
Project Descript	tion												1	414**	21
Demand Inform	nation				EB			WE	3		NB			SB	
Approach Move	ment			L	Т	R	L	T	R	L	T	R	L	Т	R
Demand (v), v	eh/h			164	188	109	84	15	3 97	119	606	70	81	577	147
0:															
Signal Informa		Deference Phase	2		7		1215		ج لے	3	<u></u> .			7	﴾
Cycle, s	65.4	Reference Phase			15	Str	기 <u>"</u>	7	, k	R	2	1	2	3	4
Offset, s	0	Reference Point	End	Green	5.4	1.2	18.9	5.5		12.2	2				
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	-	0.0	4.0	4.0		4.0	_ `	-	Ψ	✓.	- ♦ ,
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2	_	6	0	7	3 8
Timer Results				EBI		EBT	WB		WBT	NBI		NBT	SBI		SBT
Assigned Phase				3	-	8	7	-	4	1		6	5	-	2
Case Number				1.1		4.0	1.1	\rightarrow	3.0	1.1		4.0	1.1		4.0
Phase Duration	. s			12.2	2	18.9	10.7	-	17.4	11.8	3	25.2	10.6	;	24.0
Change Period,	(Y+R	ε), S		5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Head	dway (/	MAH), s		3.1	\neg	3.2	3.1	\neg	3.2	3.1		3.1	3.1	\neg	3.1
Queue Clearan	ce Time	(gs), S		6.7		12.6	4.4		6.8	5.7		16.6	3.9		13.8
Green Extensio	n Time	(ge), S		0.2		1.0	0.1		1.0	0.3		3.4	0.1		2.9
Phase Call Prof	bability			1.00		1.00	0.78	3	1.00	0.94	1	1.00	0.77	7	1.00
Max Out Probal	bility			0.00		0.00	0.00)	0.00	0.00)	0.01	0.00		0.20
Movement Gro	un Res	ults			EB			WB			NB			SB	
Approach Move		, unto		L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow F), veh/h		164	297		84	153	97	156	452	435	81	374	350
		ow Rate (ε), veh/h/l	n	1767	1741		1767	1856	1572	1838	1856	1788	1838	1856	1725
Queue Service	Time (g s), S		4.7	10.6		2.4	4.8	3.5	3.7	14.6	14.6	1.9	11.8	11.8
Cycle Queue C	learanc	e Time (gε), s		4.7	10.6		2.4	4.8	3.5	3.7	14.6	14.6	1.9	11.8	11.8
Green Ratio (g.	/C)			0.29	0.21		0.27	0.19	0.19	0.39	0.31	0.31	0.37	0.29	0.29
Capacity (c), v	eh/h			440	366		277	347	294	378	570	549	297	536	499
Volume-to-Capa	acity Ra	itio (X)		0.373	0.812	!	0.303	0.441	0.330	0.414	0.793	0.793	0.273	0.698	0.701
Back of Queue	(Q), f	t/In (95 th percentile	:)	82	194		42	91	56	63	227	215	33	214	198
		eh/ln (95 th percenti		3.2	7.6		1.6	3.6	2.2	2.5	8.9	8.6	1.3	8.3	7.9
		RQ) (95 th percent	tile)	0.45	0.00		0.37	0.00		0.63	0.00	0.00	0.27	0.00	0.00
Uniform Delay (18.2	24.6		19.3	23.6		14.7	20.8	20.8	15.6	20.7	20.8
Incremental Del				0.2	1.7		0.2	0.3	0.2	0.2	0.6	0.6	0.2	1.0	1.2
Initial Queue De				0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (Level of Service				18.4 B	26.3 C		19.5 B	23.9 C	23.3 C	14.8 B	21.4 C	21.4 C	15.8 B	21.8 C	21.9 C
Approach Delay				23.5		С	22.6		C	20.4		C	21.2		C
Intersection Del				23.3			1.5		-	20.5			C 21.2		-
	,,														
Multimodal Re	sults				EB			WB			NB			SB	
Pedestrian LOS				2.28	-	В	2.28	3	В	2.10	\rightarrow	В	1.91	\rightarrow	В
Bicycle LOS Sc	ore / LC	OS		1.25	5	Α	1.04	4	Α	1.14	1	Α	1.15	5	Α

Table 60. Pennsylvania Ave and JFK Rd Tuesday 11AM-Noon HCS Existing Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	ion R	esul	ts Sun	nmary	,				
C	-4:									4: I E				41.0.	witt'
General Inforn	nation							_	Intersec				- i		
Agency									Duration	,	1.000		2		
Analyst						e 2/15/2	2024		Area Typ	e	Other				· ·
Jurisdiction				Time F	Period				PHF		1.00		3		; -
Urban Street		John F Kennedy		Analys	sis Yea	r 2024			Analysis	Period	1> 12	2:00			
Intersection		11am-12pm Penn/J	FK	File N	ame	TUES	DAY Int	ersect	tion (Pen	n-JFK)_	existing	FINA		5 1 5	
Project Descrip	tion												7	4144	2 (
Demand Inform	nation				EB			W	R		NB			SB	
				L	Τ	R	1	T	_	L	T	R	1	T	R
Approach Move				_	188		84	_	_	_	-	_	81	-	-
Demand (v), v	en/n			164	100	109	84	15	3 97	119	606	70	81	577	147
Signal Informa	ition				Ţ	\top	215				<u>S</u>			_ [_
Cycle, s	65.5	Reference Phase	2		7	54	7 51	2Ľ	Ħ	H.	F .	7 4			Z
Offset, s	0	Reference Point	End	Green	[]	112	18.9	5.5		12.3		1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	4.0		4.0	<u> </u>		rt-	_	,
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2		1.2		1 6		7	❤
									,						
Timer Results				EBI	L	EBT	WB	L	WBT	NBI		NBT	SBI	L	SBT
Assigned Phas	е			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	1, S			12.2	2	19.0	10.7	7	17.5	11.8	3	25.2	10.6	5	24.0
Change Period	, (Y+R	c), S		5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Hea	dway (/	MAH), s		3.1		3.2	3.1		3.2	3.1		3.1	3.1		3.1
Queue Clearan				6.7	-	12.7	4.4		6.8	5.7		16.7	3.9		13.9
Green Extension				0.1	_	1.0	0.1	-	1.0	0.3	-	3.3	0.1	-	3.4
Phase Call Pro				1.00	-	1.00	0.78	-	1.00	0.94	$\overline{}$	1.00	0.77	-	1.00
Max Out Proba				0.03	-	0.00	0.00	_	0.00	0.00	-	0.05	0.00	_	0.00
M								11.5			1:5				
Movement Gro		suits		-	EB	-		WB	_		NB	-		SB	
Approach Move				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow	Rate (v), veh/h		164	297		84	153	97	156	452	435	81	374	350
Adjusted Satura	ation Flo	ow Rate (ε), veh/h/l	n	1767	1741		1767	1856	1572	1838	1856	1788	1838	1856	1725
Queue Service	Time (g s), S		4.7	10.7		2.4	4.8	3.5	3.7	14.7	14.7	1.9	11.8	11.9
Cycle Queue C	learanc	e Time (g ε), s		4.7	10.7		2.4	4.8	3.5	3.7	14.7	14.7	1.9	11.8	11.9
Green Ratio (g	/C)			0.30	0.21		0.27	0.19	0.19	0.39	0.31	0.31	0.37	0.29	0.29
Capacity (c), v	/eh/h			442	367		279	349	296	378	570	549	297	537	499
Volume-to-Cap	acity Ra	atio (X)		0.371	0.809		0.301	0.43	0.328	0.413	0.793	0.793	0.273	0.697	0.70
		t/ln (95 th percentile)	82	194		42	91	57	64	231	219	33	212	197
		eh/ln (95 th percenti	_	3.2	7.6		1.6	3.6	2.2	2.5	9.0	8.8	1.3	8.3	7.9
		RQ) (95 th percent		0.45	0.00		0.37	0.00	_	0.64	0.00	0.00	0.28	0.00	0.00
Uniform Delay			-,	18.2	24.7		19.3	23.6		14.7	20.9	20.9	15.6	20.8	20.8
Incremental De	· · · · ·			0.2	1.7		0.2	0.3	-	0.2	0.6	0.7	0.2	0.6	0.7
Initial Queue D				0.0	0.0		0.0	0.0	_	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (**		18.4	26.3		19.5	23.9		14.9	21.5	21.6	15.8	21.4	21.5
Level of Service				В	С		В	С	C	В	С	С	В	С	С
Approach Dela	<u> </u>			23.5		С	22.7		С	20.5		С	20.9		С
Intersection De							1.4						C		
Multimodal Re	sults				EB			WB			NB			SB	
Pedestrian LOS				2.28	3	В	2.28	3	В	2.10)	В	1.91	1	В
Bicycle LOS So	ore / LC	OS		1.25	5	Α	1.04	4	Α	1.14	1	Α	1.15	5	Α

Table 61. Pennsylvania Ave and JFK Rd Tuesday 4-5PM HCS Existing Conditions

		HCS	Sigr	nalize	d Int	ersec	tic	on R	esul	ts Sun	nmary	,				
General Inforn	nation									Intersec				- i	4761	
Agency										Duration	, h	1.000)			
Analyst				Analys	sis Dat	te 2/15	/20	24		Area Typ	e	Other		<u>^</u>		٠.
Jurisdiction				Time F	Period					PHF		1.00		3		≒
Urban Street		John F Kennedy		Analys	sis Yea	ar 2024	4			Analysis	Period	1> 12	:00	-		
Intersection		4-5pm Penn/JFK		File N	ame	TUE	SD	AY Int	ersec	tion (Pen	n-JFK)_	existing	J.XUS		5 1 5	
Project Descrip	tion													1	4144	21
Demand Inforr	mation				EB	,			W	D D		NB			SB	
					ΤŢ	R		L	T	_	+ -	T	T R		T	R
Approach Move				172	294	_	_	76	_		118	_		81	606	-
Demand (v), v	en/n		-	1/2	294	90	,	/0	23	4 74	118	043	26	01	000	141
Signal Informa	ition				Ţ			215	Τ.		Τ.	<u>S</u>			_	
Cycle, s	67.9	Reference Phase	2	1	1 15	100	12	54)	2H		R	E.	\ 4	<u> </u>		Y
Offset, s	0	Reference Point	End	Green	5 4	1.5	11	17.8	5.3	1.5	16.0		1	2	3	A
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	_	4.0	4.0		4.0	՛— [EŤ=		
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0		1.1	1.2		1.2		5	Y	7	-€
Timer Results				EBI	L	EBT	Т	WB	L	WBT	NB	L	NBT	SBI	L	SBT
Assigned Phas	е			3		8	Т	7	\neg	4	1		6	5		2
Case Number				1.1		4.0	Т	1.1	\neg	3.0	1.1		4.0	1.1		4.0
Phase Duration	1, S			12.1	1	22.7	7	10.5	5	21.2	11.8	3	24.3	10.3	3	22.9
Change Period	(Y+R	ε), S		5.2		5.2	1	5.2	\neg	5.2	5.2		5.1	5.2		5.1
Max Allow Hea	dway (/	MAH), s		3.1	\neg	3.1	т	3.1	\neg	3.1	3.1		3.1	3.1		3.1
Queue Clearan				6.9	-	16.2	+	4.1	-	9.5	5.8	-	17.4	3.8	-	12.9
Green Extension				0.3	_	1.3	+	0.1	-	1.3	0.3	-	1.7	0.1	-	0.6
Phase Call Pro		(9-7,0		0.96	-	1.00	٠	0.76	\rightarrow	1.00	0.94	\rightarrow	1.00	0.73	\rightarrow	1.00
Max Out Proba				0.00	_	0.00	+	0.00	-	0.00	0.00	_	0.05	0.00		1.00
Wide Out 1 Toba	Dility			0.00		0.00	ė	0.00		0.00	0.00		0.00	0.00		1.00
Movement Gro	oup Res	ults			EB		Ι		WE			NB			SB	
Approach Move	ement			L	T	R	_	L	T	R	L	T	R	L	T	R
Assigned Move	ment			3	8	18	Т	7	4	14	1	6	16	5	2	12
Adjusted Flow	Rate (v), veh/h		172	390		Т	76	234	74	147	446	433	69	327	308
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1767	1777	7	T	1767	1856	1572	1838	1856	1801	1838	1856	1734
Queue Service	Time (g s), S		4.9	14.2		T	2.1	7.5	2.6	3.8	15.4	15.4	1.8	10.8	10.9
Cycle Queue C	learanc	e Time (g ε), s		4.9	14.2		T	2.1	7.5	2.6	3.8	15.4	15.4	1.8	10.8	10.9
Green Ratio (g	/C)			0.34	0.26		T	0.32	0.24	0.24	0.36	0.28	0.28	0.34	0.26	0.26
Capacity (c), v	/eh/h			428	459		T	266	438	371	368	526	510	262	486	454
Volume-to-Cap	acity Ra	itio (X)		0.401	0.849	9	(0.286	0.53	4 0.199	0.401	0.848	0.848	0.263	0.673	0.679
		t/In (95 th percentile)	84	245		\uparrow	37	142	41	67	243	232	31	193	181
		eh/ln (95 th percenti		3.3	9.6		T	1.4	5.6	1.6	2.6	9.5	9.3	1.2	7.5	7.2
Queue Storage	Ratio (RQ) (95 th percent	ile)	0.46	0.00		\uparrow	0.32	0.00	0.36	0.67	0.00	0.00	0.26	0.00	0.00
Uniform Delay				17.0	24.0	-	-	18.4	22.7	-	16.3	23.0	23.0	17.6	22.5	22.5
Incremental De				0.2	1.8	-	Ť	0.2	0.4	-	0.2	1.0	1.0	0.1	2.1	2.4
Initial Queue D	elay (d	з), s/veh		0.0	0.0		T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (17.3	25.7		\uparrow	18.6	23.1	20.9	16.4	24.0	24.0	17.8	24.6	24.9
Level of Service				В	С		1	В	С	С	В	С	С	В	С	С
				23.1		c		21.8	_	С	22.9		С	24.1	_	С
	roach Delay, s/veh / LOS section Delay, s/veh / LOS						23.1			_				C		
	ection Delay, s/veh / LOS															
Multimodal Re	sults				EB		T		WE			NB			SB	
Pedestrian LOS	Score	/ LOS		2.27	7	В	T	2.28	3	В	2.10)	В	1.91	1	В
Bicycle LOS So	ore / LO)S		1.41	1	Α		1.12)	Α	1.16	3	Α	1.17	7	Α

Table 62. Pennsylvania Ave and JFK Rd Tuesday 4-5PM HCS Existing Conditions Optimized

General Inform	nation								ntersec	tion Inf	ormatio	n	1 2	43.01	ыŲ
Agency								ı	Duration,	h	1.000			4.1	
Analyst		Ì		Analys	sis Date	e 2/15/2	2024	1	Area Typ	е	Other		3		
Jurisdiction				Time F				F	PHF		1.00				
Urban Street		John F Kennedy		Analys	sis Year	r 2024		1	Analysis	Period	1> 12	:00	=======================================		•
Intersection		4-5pm Penn/JFK		File Na			DAY Int		on (Penr					K + 4	
Project Descrip	tion												7 7	4141	7 1
Demand Inform	nation				EB		4	WB	1	\downarrow	NB			SB	
Approach Move	ment			L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), v	eh/h			172	294	96	76	234	74	118	645	58	81	606	14
Signal Informa	tion						I II:				5				
Cycle, s	69.2	Reference Phase	2	1	2			_		R	} ■			→	→
Offset, s	39	Reference Point	End		5	1.50	7 1					1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Green		1.4	19.1	5.4	1.5	15.9	<u> </u>			_	
Force Mode	Fixed	Simult. Gap N/S	On	Yellow Red	1.2	0.0	1.1	1.2	0.0	1.2	`	L	Y	¥ ,	-⊕
i orce wioue	rixed	Gilluit. Gap 14/3	Oll	rveu	1.2	0.0	11.1	1.2	10.0	1.2				,	-
Timer Results				EBI	L	EBT	WB	L	WBT	NBI		NBT	SBL		SBT
Assigned Phase	е			3		8	7	\top	4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	. s			12.1	-	22.6	10.6	5	21.1	11.8		25.6	10.4		24.2
Change Period,	(Y+R	c). S		5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
	x Allow Headway (<i>MAH</i>), s			3.1	_	3.1	3.1	_	3.1	3.1	-	3.1	3.1	-	3.1
	eue Clearance Time (g s), s			7.0	-	16.6	4.2	-	9.7	5.8	-	17.4	3.8	-	12.9
	eue Clearance Time (g s), s een Extension Time (g e), s			0.1	-	0.8	0.1	-	0.8	0.3	-	3.0	0.1	-	3.0
Phase Call Prol		(3-7)		0.96	-	1.00	0.77	-	1.00	0.94	\rightarrow	1.00	0.73	-	1.00
Max Out Proba				0.05	_	0.00	0.00	_	0.36	0.00	-	0.02	0.00	-	0.04
Movement Gro		sults			EB	,		WB			NB			SB	
Approach Move				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow I		••		172	390		76	234	74	147	446	433	69	327	30
•		ow Rate (s), veh/h/l	n	1767	1777		1767	1856	1010	1838	1856	1801	1838	1856	173
Queue Service				5.0	14.6		2.2	7.7	2.6	3.8	15.4	15.4	1.8	10.7	10.
		e Time (gε), s		5.0	14.6		2.2	7.7	2.6	3.8	15.4	15.4	1.8	10.7	10.
Green Ratio (g				0.33	0.25		0.31	0.23	0.23	0.37	0.30	0.30	0.35	0.28	0.2
Capacity (c), v				416	448		255	426	361	378	551	535	271	513	47
Volume-to-Cap				0.413	0.871		0.299	0.549	-	0.390	0.809	0.809	0.254	0.638	0.64
		t/In (95 th percentile	,	87	254		38	150	42	67	245	233	31	187	17
		eh/ln (95 th percenti		3.4	9.9		1.5	5.8	1.7	2.6	9.6	9.3	1.2	7.3	7.0
		RQ) (95 th percent	tile)	0.48	0.00		0.33	0.00	0.37	0.67	0.00	0.00	0.26	0.00	0.0
Uniform Delay (. ,,			17.8	24.9		19.1	23.5	21.6	15.9	22.6	22.6	17.2	22.0	22
Incremental De				0.2	2.2		0.2	0.9	0.1	0.2	0.7	0.8	0.1	0.4	0.
Initial Queue De		••		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Control Delay (18.0	27.0		19.4	24.4	_	16.1	23.3	23.3	17.4	22.4	22.
Level of Service				В	C		В	C	С	В	C	С	В	C	С
Approach Delay	, s/veh	/ LOS		24.3	3	С	22.9)	С	22.3	3	С	22.0)	С
Intersection De	ersection Delay, s/veh / LOS					22	2.7						С		
Multima del C	lt-							ME			NID			00	
Multimodal Re		// 00		2.28	EB	D	2.00	WB	_	24	NB	D.	4.01	SB	-
redestrian LOS	estrian LOS Score / LOS				1	B A	2.28	_	B A	2.10	-	A A	1.91	<u> </u>	B A

Table 63. Pennsylvania Ave and JFK Rd Tuesday 5-6PM HCS Existing Conditions

		HUS	SSIGI	nalize	d Inte	ersect	ion R	esu	lts Sun	nmary					
General Inform	nation								Intersec	tion Inf	ormatio	on	1 3	43.00	je lij
Agency	lution								Duration		1.000			4.1	
Analyst				Analys	ie Date	2/15/2	2024		Area Typ	,	Other		- 2		
Jurisdiction				Time F		2/13/2	.024		PHF	,,,	1.00		- <u>-</u>		-
Urban Street		John F Kennedy				2024			Analysis	Dorind	1> 12	-00	- 3		•
Intersection		5-6pm Penn/JFK		File Na		-	DAV Int	orcoc	tion (Pen				-		
Project Descrip	tion	5-opin r ennior K		I lie ivi	anne	TIOES	וווו ואטו	CISCL	uon (r en	11-01 IX)_	existing		- 4	ৰ † কুম	21
D					- F.D.			14			ND			0.0	
Demand Inform					EB		+ .	W		+ .	NB		+ -	SB	
Approach Move				L	T	R	L	1		L	T 700	R	L	T	R
Demand (v), v	eh/h	_		180	318	111	99	25	0 86	134	760	78	103	649	17
Signal Informa	ition				Ţ		215				<u></u>			_ [Δ
Cycle, s	71.4	Reference Phase	2		7	150	Z 51	2Ľ		ĸ	È	\	<u> </u>	- ^ .∥	V
Offset, s	0	Reference Point	End	Green	5.5	1.0	18.2	6.0	1.2	18.7	,		2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	-	0.0	4.0	4.0		4.0	_ (SÎZ		7
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2		1.2		- 6	0	7	-
Timer Results				EBI	-	EBT	WB	L	WBT	NBI	-	NBT	SBI	_	SBT
Assigned Phase Case Number	e			1.1		4.0	1.1		3.0	1.1		6 4.0	5 1.1		4.0
				12.4	-	25.1	11.2	\rightarrow	23.9	11.7	, -	24.4	10.7	_	23.3
Phase Duration, s Change Period. (Y+R c), s				5.2	_	5.2	5.2	_	5.2	5.2	_	5.1	5.2	_	5.1
Change Period, (Y+R c), s Max Allow Headway (MAH), s				3.1	-	3.1	3.1	\rightarrow	3.1	3.1	-	3.1	3.1	_	3.1
Queue Clearan		**		-	_		4.8	\rightarrow	10.2	5.7	-	17.6	4.1	-	13.0
Green Extensio				7.2 0.3	-	18.5	0.1	\rightarrow	1.5	0.2	-	1.6	0.1	-	0.5
Phase Call Prol		(y e), s		0.97	-	1.00	0.86	\rightarrow	1.00	0.2	$\overline{}$	1.00	0.78	_	1.00
Max Out Probal				0.00	_	0.01	0.00	-	0.00	0.00	-	0.05	0.00	_	1.00
	,														
Movement Gro	up Res	sults			EB			WE	_		NB			SB	
Approach Move				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move	ment			3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow F	Rate (v), veh/h		180	429		99	250	86	134	426	412	76	316	29
		ow Rate (ε), veh/h/l	n	1767	1773		1767	185		1838	1856	1794	1838	1856	172
Queue Service				5.2	16.5		2.8	8.2		3.7	15.5	15.6	2.1	10.9	11.
		e Time (gε), s		5.2	16.5		2.8	8.2		3.7	15.5	15.6	2.1	10.9	11.
Green Ratio (g				0.36	0.28		0.35	0.26		0.35	0.27	0.27	0.33	0.26	0.2
Capacity (c), v				446	495		270	486		354	501	485	259	474	44
Volume-to-Capa				0.404	0.867		0.366	-	-	0.379	0.850	0.850	0.296	0.665	0.67
		t/In (95 th percentile		89	282		49	156		66	274	261	38	197	18
		eh/ln (95 th percent		3.5	11.0		1.9	6.1		2.6	10.7	10.4	1.5	7.7	7.4
		RQ) (95 th percent	tile)	0.49	0.00		0.42	0.00		0.66	0.00	0.00	0.31	0.00	0.0
Uniform Delay (16.7	24.5		18.5	22.5		17.5	24.7	24.7	18.8	23.9	23.
Incremental De				0.2	2.9		0.3	0.3		0.2	1.6	1.7	0.2	2.0	2.3
Initial Queue De		••		0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (16.9	27.4		18.8	22.8		17.7	26.3	26.4	18.9	25.9	26.
Level of Service				В	С		В	C		В	C	С	В	С	_ C
Approach Delay				24.3	3	С	21.5	5	С	25.2	2	С	25.3	3	С
Intersection Del	lay, s/ve	eh / LOS				24	4.4						С		
Multimodal Re	sulte				EB			WE	2		NB			SB	
		/108		2.27	_	В	2.28	_	В	2.11		В	1.92		В
r euestriali LOS	edestrian LOS Score / LOS cycle LOS Score / LOS					A	1.21	\rightarrow	A	1.29	-	A	1.92	$\overline{}$	A

Table 64. Pennsylvania Ave and JFK Rd Tuesday 5-6PM HCS Existing Conditions Optimized

			ŭ					-	s Sun	a. y					
General Inform	nation								ntersec	tion Inf	ormatio	nn	T k	4.50	ьŲ
Agency	iation							_	Duration.		1.000			4.1	
Analyst				Apalyo	ie Det	e 2/15/2	2024	\rightarrow	Area Typ		Other		2		
Jurisdiction				Time F		2/13/	2024		PHF	-	1.00				- 1
Urban Street		John F Kennedy				r 2024		_		Dorind	1> 12	-00	- 3		•
Intersection		5-6pm Penn/JFK		File Na			DAV Int		Analysis on (Peni				-		
Project Descrip	tion	5-opiii Felili/JFK		File IV	anne	TOES	DATIII	ersecu	on (Feni	I-JFK)_	existing	FINA	- 4	4 1 4 2	26
Project Descrip	LIOTI			_		_	_		_						
Demand Inform	nation				EB		$\overline{}$	WE	3	$\overline{}$	NB		$\overline{}$	SB	
Approach Move					Т	R	1	T	R		T	T R		T	T R
Demand (v), v				180	318		99	250		134	760		103	649	17
Signal Informa	tion				Ţ		215				5				Δ
Cycle, s	73.2	Reference Phase	2		7	51		2 L	4	R	ķ	\ \<	,		Z
Offset, s	38	Reference Point	End	Green	5.6	1.0	19.7	6.1	1.4	18.8		1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	4.0	0.0	4.0	_ (SÎZ.	_	7
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		- 6	0	7	<u>-⊹</u>
Timer Results				EBI	L	EBT	WB	L	WBT	NBI	L	NBT	SBI	L	SBT
Assigned Phase	е			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	hase Duration, s			12.7	7	25.4	11.3	3	24.0	11.8	3	25.8	10.8	3	24.8
Change Period,	hange Period, (Y+R ε), s			5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Head	dway (/	<i>МАН</i>), s		3.1		3.1	3.1		3.1	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	e (g s), S		7.3		19.0	4.9		10.5	5.7		17.7	4.1		13.1
Green Extension	n Time	(ge), S		0.3		1.0	0.1		1.1	0.2		2.8	0.1		3.0
Phase Call Prol	bability			0.97	7	1.00	0.87	7	1.00	0.94	1	1.00	0.79	9	1.00
Max Out Proba	bility			0.00		0.00	0.00		0.15	0.00		0.05	0.00		0.00
Movement Gro	un Res	sults			EB			WB			NB			SB	
Approach Move		, unto		L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow F) veh/h		180	429		99	250	86	134	426	412	76	316	296
		ow Rate (s), veh/h/l	n	1767	1773		1767	1856	1572	1838	1856	1794	1838	1856	172
Queue Service				5.3	17.0	-	2.9	8.5	3.2	3.7	15.7	15.7	2.1	11.0	11.1
Cycle Queue C				5.3	17.0		2.9	8.5	3.2	3.7	15.7	15.7	2.1	11.0	11.
Green Ratio (g				0.36	0.28	-	0.34	0.26	0.26	0.36	0.28	0.28	0.35	0.27	0.2
Capacity (c), v				438	489		262	476	403	364	526	508	267	501	464
Volume-to-Capa		itio (X)		0.411	0.877	,	0.377	0.525	0.213	0.368	0.810	0.811	0.287	0.630	0.63
		t/In (95 th percentile)	93	287		51	164	51	67	275	262	38	193	179
		eh/ln (95 th percenti		3.6	11.2		2.0	6.4	2.0	2.6	10.7	10.5	1.5	7.5	7.2
Queue Storage	Ratio (RQ) (95 th percent	ile)	0.51	0.00		0.44	0.00	0.44	0.67	0.00	0.00	0.32	0.00	0.0
				17.4	25.4		19.3	23.5	_	17.2	24.5	24.5	18.5	23.6	23.
	niform Delay (d 1), s/veh cremental Delay (d 2), s/veh				2.1		0.3	0.5	0.1	0.2	1.2	1.2	0.2	0.4	0.4
	itial Queue Delay (d s), s/veh				0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (••		0.0 17.6	27.5		19.6	24.0	21.6	17.5	25.7	25.7	18.7	24.0	24.
Level of Service	(LOS)			В	С		В	С	С	В	С	С	В	С	С
	pproach Delay, s/veh / LOS			24.6	5	С	22.5	5	С	24.6	5	С	23.4	1	С
	ersection Delay, s/veh / LOS					2	4.0						С		
Multimodal Da	Itimodal Results				ED			ME			ND			CD.	
	Itimodal Results				EB	D	2.20	WB	D	2.44	NB	D	4.00	SB	D
regesirian i OS	destrian LOS Score / LOS cycle LOS Score / LOS				3	В	2.28	5	В	2.11		В	1.92	2	В

Table 65. Wacker Dr and JFK Rd Tuesday 11AM-Noon HCS Existing Conditions

			. o.g.	iuii20	4 11110	10000	ion R	JJu	113 0	, di	······································					
General Inform	nation								Inter	rsect	ion Info	ormatio	on	I A	Allet	ьŲ
Agency									_	ation.		1.000			4.1	
Analyst				Analys	is Date	2/20/2	024		_	Тур		Other		- 2		
Jurisdiction				Time F					PHF			1.00		## ## ## ## ## ## ## ## ## ## ## ## ##		
Urban Street		Wacker/JFK			is Year	2024		_			Period	1> 7:0	00			
Intersection		Wacker/JFK 11AM-	NOON	File Na		-	DAY Int	ersec				_				
Project Descript	tion	Wacker/JFK TUESI										,		7	4147	21
Demand Inforn	nation				EB			W	(D			NB			SB	
Approach Move					T	R	L		_	R	L	T	R	1	T	R
Demand (v), v				286	6	49	6		_	8	75	494	5	13	383	213
Demanu (v), v	en/n			200	0	49	0	4		·	75	494	3	13	303	21.
Signal Informa					7	\top	215	7 2			Т	Ī				_
Cycle, s	50.0	Reference Phase	2	l	5	512	7 SA	ŗŔ	2				-	Y	2 -	—⊕
Offset, s	0	Reference Point	End	Green	0.7	3.7	15.0	7.9	9	1.2	0.0					- T
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	3.0)	3.0	0.0	-		<u> </u>	⋰	4
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.	5	2.5	0.0		6	0	7	
Timer Results				EBI		EBT	WBI		WB	T I	NBL		NBT	SBI		SBT
Assigned Phase				EBI		4	VVD	-	8	1	5		2	1		6
Case Number						10.0		+	12.0	0	1.1		4.0	1.1		4.0
Phase Duration					-	13.4		-	6.7	$\overline{}$	9.4	_	24.2	5.7	-	20.5
	hange Period, (Y+R c), s					5.5	_	\rightarrow	5.5	$\overline{}$	5.0		5.5	5.0	-	5.5
Max Allow Head	•				_	3.2		\rightarrow	3.2	-	3.1	_	3.1	3.1	-	3.1
				_		7.3	_	\rightarrow	2.2	_	4.6		12.8	2.2	-	7.4
Queue Clearan Green Extensio				_	-	0.7	_	\rightarrow	0.0	$\overline{}$	0.2	-	3.0	0.0	-	3.0
Phase Call Prof		(y e), s		_		0.7	_	-	0.20	$\overline{}$	0.2	,	1.00	0.0	\rightarrow	1.00
Max Out Probal					-	0.00		-	0.00	-	0.00	_	0.00	0.10	-	0.00
Max Out 1 1000	Unity					0.00			0.00		0.00		0.00	0.00		0.00
Movement Gro	up Res	sults			EB			WE	3			NB			SB	
Approach Move	ment			L	T	R	L	Т		R	L	T	R	L	T	R
Assigned Move	ment			7	4	14	3	8	_ 1	18	5	2	12	1	6	16
Adjusted Flow F	Rate (v), veh/h		143	198		8			8	147	488	487	10	248	22
Adjusted Satura	ation Flo	ow Rate (ε), veh/h/l	ln	1810	1762		1831		16	610	1810	1900	1893	1810	1900	167
Queue Service	Time (g s), S		3.6	5.3		0.2		_).2	2.6	10.8	10.8	0.2	5.2	5.4
Cycle Queue C	learanc	e Time (g ε), s		3.6	5.3		0.2		0).2	2.6	10.8	10.8	0.2	5.2	5.4
Green Ratio (g.	/C)			0.16	0.16		0.02		0.	.02	0.40	0.37	0.37	0.31	0.30	0.3
Capacity (c), v				287	280		44		_	39	481	710	708	236	570	502
Volume-to-Capa	acity Ra	atio (X)		0.497	0.707		0.182		_	207	0.305	0.688	0.688	0.044	0.434	0.44
		t/In (95 th percentile		62	90		4			4	38	154	153	3	86	79
		eh/In (95 th percent		2.5	3.6		0.2		_).2	1.5	6.1	6.1	0.1	3.4	3.2
		RQ) (95 th percent	tile)	0.12	0.18		0.09		0.	.09	0.19	0.31	0.31	0.05	0.17	0.1
Uniform Delay (19.2	19.9		23.9		23	3.9	10.2	13.2	13.2	12.7	14.1	14.
Incremental Del	lay (d 2), s/veh		0.5	1.2		0.7		1	1.0	0.1	0.3	0.3	0.0	0.2	0.2
Initial Queue De				0.0	0.0		0.0		$\overline{}$	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (19.7	21.2		24.7		24	4.9	10.3	13.5	13.5	12.7	14.2	14.3
Level of Service	<u> </u>			В	C		С			С	В	В	В	В	В	В
Approach Delay	/, s/veh	/LOS		20.6	j	С	24.8		С		13.0)	В	14.3	3	В
Intersection Del	ay, s/ve	eh / LOS				14	.7							В		
Multimodal Do	eulte				ED			10/1)			NID			QD.	
Multimodal Re		/100		2.28	EB	В	2.20	WE	В		4 00	NB	D	2.00	SB	D
	destrian LOS Score / LOS cycle LOS Score / LOS) [ь	2.29	, I	В	- 1	1.89	, ,	В	2.09	9	В

Table 66. Wacker Dr and JFK Rd Tuesday 11AM-Noon HCS Existing Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	ion R	esu	lts Sun	nmary	,				
General Inform	nation								Intersec	tion Inf	ormatio	on	1	4761	j. U
Agency									Duration	, h	1.000			4.7	
Analyst				Analys	sis Date	e 2/20/2	024		Area Typ	е	Other		4		
Jurisdiction				Time F					PHF		1.00		\$ *		÷
Urban Street		Wacker/JFK				r 2024			Analysis	Period	1> 7:0	00	C		
Intersection		Wacker/JFK 11AM-	NOON	File N		-	DAY Int	erse	ction (Wad		1		-		
Project Descrip	tion	Wacker/JFK TUESI		1		1.020	D/11 III	0,00	ottori (Trac		.,_0,	ngi ni.	- 4	বাক্ষ	21
1 Toject Descrip	uon	Wackenor K TOZOL	,,,,												
Demand Inform	nation				EB		$\overline{}$	V	/B	$\overline{}$	NB		$\overline{}$	SB	
Approach Move				L	T	R	1	_	T R	1	T	R	L	T	R
Demand (v), v				286	6	49	6	-	2 8	75	494	5	13	383	213
Demand (V), V	CHI/H			200	_	43		-	2 0	7.5	454	,	10	303	213
Signal Informa	tion				I		215		8		_				
Cycle, s	49.6	Reference Phase	2	1	7			_ 🗠	? 闰		•		KŽZ.		А
Offset, s	0	Reference Point	End		1	T)						1	2	3	<u> 7</u>
Uncoordinated	Yes	Simult. Gap E/W	On	Green		3.7	15.0	7.		0.0		.]		_	4
		· ·		Yellow		0.0	4.0	3.		0.0		\ ዺ	-	-∕` ∫	Z
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.	5 2.5	0.0		6	0	7	
Timon Donulto				EDI		EDT	WD		WDT	NIDI		NDT	ODI		ODT
Timer Results	_			EBI	-	EBT	WBI	-	WBT	NBI	-	NBT	SBI	_	SBT
Assigned Phase	е			_	_	4	\vdash	-	8	5	_	2	1	_	6
Case Number				_	_	10.0	_	_	12.0	1.1	_	4.0	1.1	-	4.0
Phase Duration	, -			\vdash	\perp	13.1		_	6.7	9.3	_	24.2	5.7	_	20.5
Change Period	, (Y+R	c), S				5.5		_	5.5	5.0		5.5	5.0		5.5
Max Allow Head	dway (/	MAH), s				3.2			3.2	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	e (gs), S				7.3			2.2	4.6		12.7	2.2		7.4
Green Extension	n Time	(ge), S				0.3		П	0.0	0.2		3.0	0.0		3.0
Phase Call Pro	bability					0.99		\neg	0.20	0.87	7	1.00	0.13	3	1.00
Max Out Proba	bility					0.35		\neg	0.00	0.00		0.00	0.00		0.00
Movement Gro	un Doc	rulte			EB			W	D		NB			SB	
Approach Move		Suits		L	T	R		T		L	T	R	L	T	R
				7	4	14	3	8	18	5	2	12	1	6	16
Assigned Move				-	_	14	8	ŏ		_					
Adjusted Flow I				143	198				8	146	486	485	10	248	225
		ow Rate (s), veh/h/l	n	1810	1762		1831		1610	1810	1900	1893	1810	1900	1674
Queue Service				3.6	5.3		0.2		0.2	2.6	10.7	10.7	0.2	5.2	5.4
Cycle Queue C	learanc	e Time (gε), s		3.6	5.3		0.2		0.2	2.6	10.7	10.7	0.2	5.2	5.4
Green Ratio (g				0.15	0.15		0.02		0.02	0.40	0.38	0.38	0.32	0.30	0.30
Capacity (c), v	/eh/h			277	270		44		39	485	715	712	240	574	506
Volume-to-Capa	acity Ra	itio (X)		0.516	0.733		0.182		0.206	0.301	0.680	0.680	0.043	0.431	0.445
Back of Queue	(Q), fl	t/In (95 th percentile)	62	91		4		4	37	150	150	3	85	78
Back of Queue	(Q), v	eh/ln (95 th percenti	le)	2.5	3.6		0.2		0.2	1.5	6.0	6.0	0.1	3.4	3.1
Queue Storage	Ratio (RQ) (95 th percent	ile)	0.12	0.18		0.09		0.09	0.19	0.30	0.30	0.05	0.17	0.15
Uniform Delay (19.3	20.1		23.8		23.8	10.0	13.0	13.0	12.5	13.9	14.0
Incremental De				0.6	1.5		0.7		1.0	0.1	0.2	0.2	0.0	0.2	0.2
Initial Queue De				0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (19.9	21.5		24.5		24.7	10.1	13.2	13.2	12.6	14.1	14.2
Level of Service				В	C		C		C	В	B	B	B	В.	B
Approach Delay				20.8		С	24.6		c	12.8		В	14.1		В
				20.0	,				U	12.0	,				В
Intersection De	idy, S/VE	sii / LUS				14	1.6						В		
Multimodal Re	sults				EB			W	В		NB			SB	
	destrian LOS Score / LOS							_							
	Score	/LOS		2.28	3	В	2.29) [В	1.89)	В	2.09)	В

Table 67. Wacker Dr and JFK Rd Tuesday 4-5PM HCS Existing Conditions

		HCS	S Sigr	nalize	d Inte	ersect	ion R	esu	Its Sun	nmary	,				
General Inform	nation								Intersec	tion Inf	ormatio	on		1,1	ال ال
Agency									Duration	, h	1.000			4.7	
Analyst				Analys	is Date	e 2/20/2	024		Area Typ	e	Other		4		
Jurisdiction				Time F	eriod				PHF		1.00		4		7
Urban Street		Wacker/JFK		Analys	is Yea	r 2024			Analysis	Period	1> 7:0	00	-		
Intersection		Wacker/JFK 4-5PM		File Na	ame	TUES	DAY Int	erse	ction (Wac	ker-JFK) existi	ing.xus	-		
Project Descrip	tion	Wacker/JFK TUESI				1			(****		-		7	4144	74
Demand Inform					EB		-	_	/B		NB		-	SB	
Approach Move	ement			L	T	R	L	_	T R	L	T	R	L	T	R
Demand (v), v	eh/h			347	2	63	5	!	9 6	96	586	5	20	459	21
Signal Informa	tion					1	121		8						
Cycle, s	51.1	Reference Phase	2		7			E	: 闰			<u>.</u>	t		
Offset, s	0	Reference Point	End		1	Si						1	2	3	Z
Uncoordinated	Yes	Simult. Gap E/W	On	Green	-	3.2	15.0	9.		0.0				,	4
Force Mode	Fixed	Simult. Gap N/S	On	Yellow Red	1.5	0.0	1.5	3. 2.		0.0		\	_	- ⁄- ,	V
r orce widde	rixed	Simult. Gap N/S	Oll	Red	1.5	0.0	1.5	Z.	J 2.5	10.0		8	0	-	
Timer Results				EBI		EBT	WBI		WBT	NBI		NBT	SBI		SBT
Assigned Phase	е					4		\neg	8	5		2	1		6
Case Number						10.0		\neg	12.0	2.0		4.0	2.0		4.0
Phase Duration	. s			-	-	14.9		_	7.0	8.7		23.7	5.6		20.5
Change Period		c) S			\rightarrow	5.5			5.5	5.0	-	5.5	5.0	-	5.5
Max Allow Head		- 77		_	_	3.3		_	3.2	3.1		3.1	3.1	_	3.1
Queue Clearan				_	_	8.6		_	2.3	4.7		8.1	2.2	-	5.2
Green Extensio				_	_	0.8		-	0.0	0.1	_	1.6	0.0	-	1.6
Phase Call Pro		(ye), o				1.00		-	0.0	0.1		1.00	0.0	-	1.00
Max Out Proba						0.00		-	0.25	0.72	-	0.00	0.10	_	0.00
Max Car i Toba	Unity					0.00			0.00	0.00		0.00	0.00		0.00
Movement Gro	up Res	sults			EB			W	В		NB			SB	
Approach Move	ement			L	T	R	L	Т	R	L	T	R	L	T	R
Assigned Move	ment			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow I	Rate (v), veh/h		174	239		10		10	96	296	295	8	145	13
Adjusted Satura	ation Flo	ow Rate (ຣ), veh/h/l	n	1810	1757		1856		1706	1810	1900	1894	1810	1900	170
Queue Service				4.4	6.6		0.3		0.3	2.7	6.1	6.1	0.2	3.0	3.2
Cycle Queue C				4.4	6.6		0.3		0.3	2.7	6.1	6.1	0.2	3.0	3.
Green Ratio (g				0.18	0.18		0.03		0.03	0.07	0.36	0.36	0.01	0.29	0.2
Capacity (c), v				332	322		54		50	132	676	674	20	558	49
Volume-to-Cap		itio (X)		0.523	0.740		0.194		0.191	0.727	0.438	0.438	0.420	0.260	0.2
		t/In (95 th percentile)	75	111		6		5	51	97	97	5	49	47
		eh/ln (95 th percenti		3.0	4.4		0.2		0.2	2.0	3.9	3.9	0.2	2.0	1.
		RQ) (95 th percent	_	0.15	0.22		0.12		0.11	0.26	0.19	0.19	0.09	0.10	0.0
Uniform Delay (18.8	19.7		24.2		24.2	23.2	12.6	12.6	25.1	13.8	13.
Incremental De				0.5	1.3		0.6		0.7	2.9	0.2	0.2	5.0	0.1	0.
Initial Queue De				0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.
Control Delay (••		19.3	21.0		24.9		24.9	26.1	12.7	12.7	30.1	13.9	14
Level of Service				В	C		C		C	C	В	В	C	В	В
Approach Delay				20.3		С	24.9		С	14.6		В	14.4		В
Intersection De							5.4	_					В		
	.,,,														
Multimodal Re	sults				EB			W	В		NB			SB	
Pedestrian LOS	destrian LOS Score / LOS				3	В	2.29		В	1.89)	В	2.09)	В
Bicycle LOS Sc	ore / LC	OS		1.17	7	Α	0.50		Α	1.05	5	Α	1.06	5	Α

Table 68. Wacker Dr and JFK Rd Tuesday 4-5PM HCS Existing Conditions Optimized

		нся	S Sigr	nalize	d Inte	ersect	ion R	esu	Its Sur	nmary	,				
General Inform	nation								Intersec				- i	476	24 14
Agency									Duration		1.000				
Analyst				Analys	is Date	2/20/2	024		Area Ty	oe	Other		_ ii		
Jurisdiction				Time F	Period				PHF		1.00		8 4		÷
Urban Street		Wacker/JFK		Analys	is Yea	r 2024			Analysis	Period	1> 7:0	00			7
Intersection		Wacker/JFK 4-5PM	I	File Na	ame	TUES	DAY Int	erse	ction (Wa	ker-JFk	()_existi	ngFIN		5 1 5	
Project Descrip	tion	Wacker/JFK TUES	DAY										1	414	21
Demand Inform	nation				EB			V	/B		NB			SB	
Approach Move				1	T	□ R	1	_	T R	1	T	R	1	T	R
Demand (v), v				347	2	63	5	_	9 6	96	586	5	20	459	213
Demand (V), V	CIVII		-	347		0.5			9 0	30	300		20	433	213
Signal Informa	tion				7	\top	21	Τ,	. ⊱	\top	l				
Cycle, s	49.8	Reference Phase	2		15	507	z 15	₽Ħ				>	P.		♣.
Offset, s	0	Reference Point	End	Green	0.6	3.1	13.9	9.	2 1.5	0.0		1	2	3	4
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	3.		0.0	-			, l	→
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2		0.0		6	0	7	8
Timer Results				EBI	_	EBT	WBI	L	WBT	NB	L	NBT	SBI		SBT
Assigned Phase	е					4			8	5		2	1		6
Case Number						10.0		\neg	12.0	2.0		4.0	2.0		4.0
Phase Duration	hase Duration, s					14.7		\neg	7.0	8.7		22.5	5.6		19.4
Change Period.	hange Period, (Y+R c), s					5.5			5.5	5.0		5.5	5.0		5.5
	hange Period, (Y+R c), s ax Allow Headway (MAH), s					3.3		\neg	3.2	3.1		3.1	3.1	$\overline{}$	3.1
Queue Clearan	- 7 (8.4		\rightarrow	2.3	4.6	-	8.0	2.2	_	5.1
Green Extensio		12 //		-	_	0.9	_	_	0.0	0.0	-	1.2	0.0	-	0.5
Phase Call Prol		(91,0		_	_	1.00	_	_	0.24	0.74	\rightarrow	1.00	0.11	-	1.00
Max Out Proba					_	0.00		-	0.00	1.00	$\overline{}$	0.21	0.00		0.00
Movement Gro		sults			EB			W		_	NB			SB	
Approach Move	ment			L	T	R	L	T		L	T	R	L	T	R
Assigned Move	ment			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow F	Rate (v), veh/h		174	239		10		10	96	296	295	8	145	137
Adjusted Satura	ation Flo	ow Rate (ε), veh/h/l	ln	1810	1757		1856		1706	1810	1900	1894	1810	1900	1700
Queue Service				4.3	6.4		0.3		0.3	2.6	6.0	6.0	0.2	3.0	3.1
Cycle Queue C		e Time (gε), s		4.3	6.4		0.3		0.3	2.6	6.0	6.0	0.2	3.0	3.1
Green Ratio (g				0.19	0.19		0.03		0.03	0.07	0.34	0.34	0.01	0.28	0.28
Capacity (c), v	eh/h			336	326		55		50	134	650	648	20	530	475
Volume-to-Capa				0.517	0.731		0.192		0.190	0.715	0.455	0.455	0.415	0.273	0.289
		t/In (95 th percentile	•	72	106		5		5	49	96	96	5	49	47
		eh/ln (95 th percent		2.9	4.3		0.2		0.2	2.0	3.8	3.8	0.2	2.0	1.9
		RQ) (95 th percent	tile)	0.14	0.21		0.12		0.11	0.25	0.19	0.19	0.08	0.10	0.09
Uniform Delay (18.3	19.1		23.6		23.6	22.5	12.8	12.8	24.5	14.0	14.1
	ncremental Delay (d 2), s/veh			0.5	1.2		0.6		0.7	2.7	0.2	0.2	4.9	0.1	0.1
	ontrol Delay (d s), s/veh			0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
				18.7	20.3		24.2		24.3	25.2	13.0	13.0	29.3	14.1	14.2
	evel of Service (LOS) pproach Delay, s/veh / LOS			B 10.6	С	В	C 24.2		С	C 14.7	B	B	C 14.6	B	B
	tersection Delay, s/veh / LOS			19.6	,		24.2		С	14.7			14.6 B	,	D
microection De	tersection belay, siven / EOO					10	1.2								
Multimodal Re	ıltimodal Results				EB			W	В		NB			SB	
	edestrian LOS Score / LOS				3	В	2.29		В	1.89		В	2.09	9	В
				1.17	-	Α	0.50	\rightarrow	Α	1.0	-	Α	1.06	$\overline{}$	Α
	cycle LOS Score / LOS										_				

Table 69. Wacker Dr and JFK Rd Tuesday 5-6PM HCS Existing Conditions

		нся	Sigr	nalize	d Inte	ersect	ion R	esu	lts Sun	nmary	,				
General Inform	nation								Intersec		_		- i	4761	25 L
Agency									Duration	, h	1.000				
Analyst				Analys	sis Date	e 2/20/2	2024		Area Typ	е	Other				. :
Jurisdiction				Time F	eriod				PHF		1.00		# 		*
Urban Street		Wacker/JFK		Analys	sis Yea	r 2024			Analysis	Period	1> 7:0	00	=		7
Intersection		Wacker/JFK 5-6PM		File Na	ame	TUES	DAY Int	erse	ction (Wac	ker-JFK)_existi	ng.xus		5 1 5	
Project Descrip	tion	Wacker/JFK TUESI	DAY										T	4147	2 (
Demand Inform	nation				EB			1/1	VB		NB			SB	
Approach Move				L	T	R	L	_	T R	L	T	R	L	T	R
				378	2	52	9	-	8 11	110	603	5	8	392	213
Demand (v), v	en/n			3/0		32	9		0 11	110	003	9	· ·	392	213
Signal Informa	ition				Ţ	\top	215	T.	_2_	\top					
Cycle, s	52.6	Reference Phase	2	1	75	54	Z 50	"Ľ	; 7			-	Ψ		-4
Offset, s	0	Reference Point	End	Green	102	4.0	15.0	9.	7 2.0	0.0		1	2	3	4
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	3.	_	0.0				я	→
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.		0.0		5		7	8
		oman supras			11.0	10.0	1		<u> </u>	1					
Timer Results				EBI		EBT	WBI	LT	WBT	NBI		NBT	SBL	. T	SBT
Assigned Phase	е					4		\neg	8	5		2	1		6
Case Number						10.0			12.0	1.1		4.0	1.1		4.0
Phase Duration	nase Duration, s					15.2			7.5	9.4		24.5	5.3		20.5
Change Period,	, (Y+R	σ), S				5.5		\Box	5.5	5.0		5.5	5.0		5.5
Max Allow Head	dway (/	MAH), s				3.3			3.2	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	e (gs), s				8.8			2.4	4.7		10.7	2.1		6.2
Green Extensio	n Time	(ge), S				0.9			0.0	0.2		2.2	0.0		2.2
Phase Call Prol	bability					1.00		\neg	0.34	0.87	7	1.00	0.07	,	1.00
Max Out Proba	bility					0.00			0.00	0.00		0.00	0.00		0.00
Movement Gro	un Ras	culte			EB			W	R		NB			SB	
Approach Move		suits		L	T	R	L	T		L	T	R	L	T	R
Assigned Move				7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow F) voh/h		189	243	17	15	-	13	142	392	391	5	184	170
		ow Rate (s), veh/h/l	n	1810	1767		1844		1654	1810	1900	1894	1810	1900	1679
Queue Service			11	5.0	6.8		0.4		0.4	2.7	8.7	8.7	0.1	4.0	4.2
Cycle Queue C				5.0	6.8		0.4		0.4	2.7	8.7	8.7	0.1	4.0	4.2
Green Ratio (g		(3)/		0.18	0.18		0.04		0.04	0.39	0.36	0.36	0.29	0.29	0.29
Capacity (c), v	/eh/h			334	326		71		64	501	688	686	259	542	479
Volume-to-Capa		atio (X)		0.566	0.745		0.208	-	0.209	0.283	0.570	0.570	0.018	0.339	0.356
		t/In (95 th percentile)	86	117		8		7	40	138	138	2	68	64
		eh/ln (95 th percent		3.4	4.7		0.3		0.3	1.6	5.5	5.5	0.1	2.7	2.5
		RQ) (95 th percent		0.17	0.23		0.17		0.16	0.21	0.28	0.28	0.02	0.14	0.13
Uniform Delay (,	19.5	20.3		24.5		24.5	11.0	13.5	13.5	13.7	14.9	15.0
Incremental De	lay (d 2), s/veh		0.6	1.3		0.5		0.6	0.1	0.2	0.2	0.0	0.1	0.2
	remental Delay (d 2), s/veh tial Queue Delay (d 3), s/veh			0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (20.1	21.6		25.1		25.1	11.1	13.7	13.7	13.7	15.0	15.1
Level of Service				С	С		С		С	В	В	В	В	В	В
	pproach Delay, s/veh / LOS			20.9		С	25.1		С	13.3	3	В	15.0		В
Intersection De							5.7						В		
	timodal Results				EB			W			NB			SB	
				2.29	\rightarrow	В	2.29	\rightarrow	В	1.89	\rightarrow	В	2.09	$\overline{}$	В
Bicycle LOS Sc	estrian LOS Score / LOS cle LOS Score / LOS			1.20)	Α	0.51		Α	1.08	3	Α	0.99)	Α

Table 70. Wacker Dr and JFK Rd Tuesday 5-6PM HCS Existing Conditions Optimized

		HCS	S Sigr	nalize	d Inte	rsect	ion R	esu	Its Sun	nmary	,				
General Inform	nation								Intersec	tion Inf	ormatio	on	i	474	34 L
Agency									Duration	•	1.000				
Analyst				Analys	sis Date	2/20/2	024		Area Typ	e	Other		△		
Jurisdiction				Time F	eriod				PHF		1.00		34		7
Urban Street		Wacker/JFK		Analys	is Year	2024			Analysis	Period	1> 7:0	00	-		
Intersection		Wacker/JFK 5-6PM	l	File Na		-	DAY Int	ersed	tion (Wad	ker-JFk	() existi	ngFIN		5 + 5	
Project Descript	tion	Wacker/JFK TUESI	DAY									_	7	4144	21
Demand Inforn	nation				EB			10	/B		NB			SB	
Approach Move					T	T 8	+ .	_		+ -	T	T B	+ -	_	T B
- T.F.				L 378	_	R 52	L	-		110	_	R 5	L 8	T 202	R
Demand (v), v	en/n			3/8	2	52	9	•	3 11	110	603) 3	0	392	213
Signal Informa	tion				7		215	Τ,	2	\top	l				_
Cycle, s	52.3	Reference Phase	2		2	l sate	Z 547	,E	2			X	Ψ.		4
Offset, s	0	Reference Point	End	Green	0.3	4.1	15.0	9.	4 2.0	0.0		1	2	3	-
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	3.		0.0				7	→
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.		0.0		6	0	7	
Timer Results				EBI	_	EBT	WBI	-	WBT	NB	L	NBT	SBI	L	SBT
Assigned Phase	9			_	_	4	_	4	8	5	_	2	1	\rightarrow	6
Case Number					\rightarrow	10.0		_	12.0	1.1	-	4.0	1.1	-	4.0
Phase Duration				\vdash		14.9	\vdash	_	7.5	9.4	_	24.6	5.3	-	20.5
Change Period,	(Y+R	c), S				5.5		_	5.5	5.0		5.5	5.0		5.5
Max Allow Head	dway (/	MAH), s				3.3			3.2	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	e (gs), S				8.8			2.4	4.7		10.7	2.1		6.2
Green Extensio	n Time	(ge), S				0.5		\neg	0.0	0.3		2.2	0.0		2.2
Phase Call Prob	bability					1.00		\neg	0.33	0.87	7	1.00	0.07	7	1.00
Max Out Probal	bility					0.16		\Box	0.07	0.00		0.00	0.00)	0.00
Movement Gro	un Res	ults			EB			WI	2		NB			SB	
Approach Move		ruito		L	T	R	L	Т	R	L	T	R	1	T	R
Assigned Move				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow F		\ vah/h		189	243	14	15	0	13	142	394	393	5	184	170
			-	_	1767				_		-				-
-		ow Rate (s), veh/h/l	111	1810			1844		1654	1810	1900	1894	1810	1900	1679
Queue Service				5.0	6.8		0.4		0.4	2.7	8.7	8.7	0.1	4.0	4.2
Cycle Queue Cl		e nine (ga), s		5.0	6.8		0.4		0.4	2.7	8.7	8.7	0.1	4.0	4.2
Green Ratio (g.				0.18	0.18		0.04		0.04	0.39	0.36	0.36	0.29	0.29	0.29
Capacity (c), v		P. 7375		325	318		71		64	505	692	690	260	545	481
Volume-to-Capa			,	0.581	0.765		0.207		0.208	0.282	0.569	0.569	0.018	0.337	0.35
		t/In (95 th percentile	,	86	118		8		7	40	137	136	2	67	63
		eh/ln (95 th percenti		3.5	4.7		0.3		0.3	1.6	5.5	5.5	0.1	2.7	2.5
		RQ) (95 th percent	tile)	0.17	0.24		0.17		0.16		0.27	0.27	0.02	0.13	0.13
Uniform Delay (19.7	20.4		24.4		24.4	10.8	13.3	13.3	13.5	14.7	14.8
Incremental Del	• •	**		0.6	1.5		0.5		0.6	0.1	0.2	0.2	0.0	0.1	0.2
Initial Queue De				0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/v	eh		20.3	21.9		24.9		25.0	10.9	13.5	13.5	13.5	14.9	15.0
Level of Service	(LOS)			С	С		С		С	В	В	В	В	В	В
Approach Delay	, s/veh	/LOS		21.2	2	С	24.9		С	13.1	1	В	14.9)	В
Intersection Del	ay, s/ve	eh / LOS				15	5.7						В		
Multimedal De	oult-				ED			10.00			NID			CD.	
Multimodal Re		11.00		2.20	EB	D	2.20	WI		4.04	NB	D	2.00	SB	D
Pedestrian LOS				2.28	-	В	2.29	\rightarrow	В	1.89	-	В	2.09	$\overline{}$	B A
Bicycle LOS Sc				1.20	-	A	0.51	\rightarrow	Α	1.08	-	A	0.99	$\overline{}$	_

Table 71. Pennsylvania Ave and JFK Rd Tuesday 11AM-Noon HCS 5 Year Projected Conditions

		HCS	Sigr	nalize	d Inte	ersect	ion R	esul	ts Sun	nmary	/				
General Inform	nation								Intersec	tion Inf	ormatio	on	1	43.00	يا او
Agency									Duration	h	1.000)		4.1	.
Analyst				Analys	sis Date	2/15/2	2024		Area Typ	е	Other		4		
Jurisdiction				Time F	Period				PHF		1.00		37		
Urban Street		John F Kennedy		Analys	sis Year	2024			Analysis	Period	1> 12	:00	7		
Intersection		11am-12pm Penn/J	FK	File N			DAY Int		ion (Pen				-		
Project Descrip	tion											,	-	4144	21
,															
Demand Inforr	nation				EB		\top	WI	3	$\overline{}$	NB		$\overline{}$	SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Demand (v), v	eh/h			172	198	115	88	16	1 102	125	637	74	85	606	154
Signal Informa	ation				Ţ		1215				5				Δ.
Cycle, s	68.9	Reference Phase	2		2	150		2 L		R	È	\ 4	<u> </u>		Y
Offset, s	0	Reference Point	End	Green	5.6	1.1	20.8	5.7	1.8	13.2)	11	2	3	4
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	4.0		4.0	_ (KÎ.		7
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2		1.2		- 6	0	7	- Ç ,
Timer Results				EBI	L	EBT	WB	L	WBT	NB	L	NBT	SBI		SBT
Assigned Phas	e			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	hase Duration, s			12.7	7	20.2	10.9	,	18.4	11.9	9	27.0	10.8	3	25.9
Change Period	hange Period, (Y+R c), s			5.2	-	5.2	5.2	_	5.2	5.2	_	5.1	5.2	_	5.1
Max Allow Hea		**		3.1	_	3.2	3.1	-	3.2	3.1	_	3.1	3.1	_	3.1
Queue Clearan				7.2	-	13.8	4.6	-	7.3	6.1	-	18.2	4.1	_	15.0
Green Extension		12 11		0.2	-	1.1	0.1	-	1.1	0.1	-	3.6	0.1	_	2.9
Phase Call Pro		(g e), s		1.00	\rightarrow	1.00	0.82	_	1.00	0.9	\rightarrow	1.00	0.80	<u> </u>	1.00
Max Out Proba				0.00	_	0.00	0.00	_	0.00	0.00	_	0.01	0.00		0.28
Wax Out 1 100a	Dility			0.00		0.00	0.00		0.00	0.00		0.01	0.00	_	0.20
Movement Gro	oup Res	sults			EB			WB			NB			SB	
Approach Move	ement			L	T	R	L	Т	R	L	T	R	L	Т	R
Assigned Move	ment			3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow I), veh/h		172	313		88	161	102	164	475	458	85	393	367
		ow Rate (ε), veh/h/l	n	1767	1740		1767	1856	1572	1838	1856	1787	1838	1856	1725
Queue Service				5.2	11.8		2.6	5.3	3.9	4.1	16.2	16.2	2.1	12.9	13.0
		e Time ($q \epsilon$), s		5.2	11.8		2.6	5.3	3.9	4.1	16.2	16.2	2.1	12.9	13.0
Green Ratio (o		(3 0), 0		0.30	0.22		0.28	0.19	_	0.40	0.32	0.32	0.38	0.30	0.30
Capacity (c), v				437	379		269	356	302	367	590	568	288	561	522
Volume-to-Cap		atio (X)		0.394	0.827		0.327	0.452		0.447	0.805	0.805	0.295	0.700	0.703
		t/In (95 th percentile	١	91	213		47	102	-	70	248	235	36	236	219
		eh/ln (95 th percenti		3.6	8.3		1.8	4.0	2.5	2.7	9.7	9.4	1.4	9.2	8.8
	* - **	RQ) (95 th percent		0.50	0.00		0.41	0.00		0.70	0.00	0.00	0.30	0.00	0.00
			iie)	18.9	25.8		_			15.2	_		_		_
Uniform Delay				0.2	1.8		0.3	24.7 0.3	0.2	0.2	21.6 0.6	21.6 0.6	16.2 0.2	1.8	21.3
	cremental Delay (d 2), s/veh itial Queue Delay (d 3), s/veh				-		_	-			_				_
	ontrol Delay (d), s/veh			0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
				19.2	27.6		20.5	25.0	_	15.4	22.2	22.2	16.4	23.1	23.3
Level of Service				B 24/	C		C	C	C	B 24.7	C	С	B 22.6	C	C
Approach Delay				24.6)	С	23.7		С	21.2	2	С	22.5)	С
Intersection De	lay, s/ve	en / LOS				2:	2.5						С		
Multimodal Re	eulte				EB			WB			NB			SB	
						D	2.20	_		2.41		D	4.04	_	D
	destrian LOS Score / LOS				3	В	2.28	-	B	2.10	-	В	1.91	-	B
DICYCIE LOS SO	ycle LOS Score / LOS				9	Α	1.07		Α	1.18	0	Α	1.18)	Α

Table 72. Pennsylvania Ave and JFK Rd Tuesday 11AM-Noon HCS 5 Year Projected Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	ion R	esu	ts Sun	nmary					
General Inform	antion.								Intersec	tion Inf				410.	KIII
	nation										_		- 6	1.1.	
Agency						la.			Duration	,	1.000		-		
Analyst						e 2/15/2	2024		Area Typ	oe .	Other				٠.
Jurisdiction				Time F		-			PHF		1.00		- E		- 7
Urban Street		John F Kennedy		Analys	sis Yea	r 2024			Analysis		1> 12				
Intersection		11am-12pm Penn/J	FK	File Na	ame	TUES	DAY Int	ersec	tion (Pen	n-JFK)_	5YEAR	projec		* 13	
Project Descrip	tion												1	414**	21
Demand Inforr	nation				EB		$\overline{}$	W	В	$\overline{}$	NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	T	R	L	Т	R
Demand (v), v				172	198	115	88	16	1 102	125	637	74	85	606	154
Cianal Informa	tion						1 11:								
Signal Informa	_	Reference Phase	2		1 %		21/2		1	3	}			7	→
Cycle, s	69.1				5	51	김 গ	7	' R	R		1	2	3	
Offset, s	0	Reference Point	End	Green		1.0	21.1	5.8		12.9					
Uncoordinated		Simult. Gap E/W	On	Yellow		0.0	4.0	4.0		4.0	_ `	7	Ψ	✓.	4
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	2 0.0	1.2		5	0	7	Y
Timer Results				EBI		EBT	WB	L	WBT	NBI		NBT	SBI		SBT
Assigned Phas	e			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	hase Duration, s					20.0	11.0	,	18.1	11.9		27.3	10.9		26.2
	hange Period, (Y+R c), s				_	5.2	5.2	\rightarrow	5.2	5.2	-	5.1	5.2	_	5.1
Max Allow Hea		**		5.2 3.1	_	3.2	3.1	\rightarrow	3.2	3.1		3.1	3.1	_	3.1
Queue Clearan				7.3	_	14.0	4.7	\rightarrow	7.4	6.1		18.3	4.1	-	15.0
Green Extension				0.3	_	0.6	0.2	\rightarrow	0.4	0.1	-	3.7	0.1	-	3.6
Phase Call Pro		13-710		1.00	-	1.00	0.82	\rightarrow	1.00	0.96	\rightarrow	1.00	0.81	-	1.00
Max Out Proba				0.00	_	0.00	0.00	-	1.00	0.00	-	0.00	0.00		0.01
Mux Out 1 1000	Dility			0.00		0.00	0.00		1.00	0.00		0.00	0.00		0.01
Movement Gro	oup Res	sults			EB			WE	3		NB			SB	
Approach Move	ement			L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move	ment			3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow I	Rate (v), veh/h		172	313		88	161	102	164	475	458	85	393	367
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1767	1740		1767	185	6 1572	1838	1856	1787	1838	1856	172
Queue Service	Time (g s), S		5.3	12.0		2.7	5.4	3.9	4.1	16.3	16.3	2.1	13.0	13.0
		e Time (g c), s		5.3	12.0		2.7	5.4		4.1	16.3	16.3	2.1	13.0	13.0
Green Ratio (g				0.30	0.21		0.27	0.19	0.19	0.41	0.32	0.32	0.39	0.31	0.3
Capacity (c), v	/eh/h			437	374		267	347	294	371	597	576	293	570	530
Volume-to-Cap		atio (X)		0.394	0.836		0.329	0.46	4 0.347	0.442	0.795	0.795	0.290	0.690	0.69
		t/ln (95 th percentile)	93	215		48	104		70	253	240	36	230	213
		eh/ln (95 th percenti		3.6	8.4		1.9	4.1	-	2.8	9.9	9.6	1.4	9.0	8.5
		RQ) (95 th percent		0.51	0.00		0.41	0.00	_	0.70	0.00	0.00	0.30	0.00	0.0
				19.2	26.2		20.6	25.2		15.1	21.5	21.5	16.0	21.2	21.
	Iniform Delay (d 1), s/veh ncremental Delay (d 2), s/veh						0.3	0.4		0.2	0.6	0.6	0.2	0.6	0.6
	itial Queue Delay (d s), s/veh						0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
	ontrol Delay (d), s/veh				0.0 28.1		20.9	25.6		15.3	22.1	22.2	16.2	21.8	21.8
Level of Service				19.4 B	C		C	C	C	В	C	C	В	C	C
	pproach Delay, s/veh / LOS					С	24.2		C	21.1	_	С	21.2		С
Intersection De				25.0			2.2						C		
					EB										
	Iltimodal Results							WE			NB			SB	
	destrian LOS Score / LOS					В	2.28	\rightarrow	В	2.10	$\overline{}$	В	1.91	$\overline{}$	В
Bicycle LOS So	ycle LOS Score / LOS					Α	1.07	7	Α	1.18	3	Α	1.18	3	Α

Table 73. Pennsylvania Ave and JFK Rd Tuesday 4-5PM HCS 5 Year Projected Conditions

		HCS	Sigr	nalize	d Inte	ersect	ion R	esul	ts Sun	ımary	,				
General Inform	nation							\rightarrow	Intersec				- i	4761	
Agency								\rightarrow	Duration		1.000		2		
Analyst				Analys	is Date	e 2/15/2	2024		Area Typ	е	Other				· ·
Jurisdiction				Time F	eriod				PHF		1.00				=
Urban Street		John F Kennedy		Analys	sis Yea	r 2024			Analysis	Period	1> 12	:00	4		
Intersection		4-5pm Penn/JFK		File Na	ame	TUES	DAY Int	tersect	ion (Peni	ı-JFK)_	5YEAR	projec		5 1 5	
Project Descrip	tion												1	414	21
Demand Inform	nation				EB			W	3		NB			SB	
Approach Move				L	Τ	R	1	ΤŢ	_	1	T	T R	1	T	R
Demand (v), v				181	309	101	80	24		124	678	_	85	637	148
Demand (V), V	CII/II			101	303	101	00	24	0 70	124	070	01	0.0	037	140
Signal Informa	tion				7		215	1 2	1 2	1 2	<u>_</u>			_ [4
Cycle, s	72.0	Reference Phase	2		7	150	z st	2Ľ	Ħ	R	Ē	\	,	- ∕` ∏	Y
Offset, s	0	Reference Point	End	Green	5.4	1.3	19.8	5.6		17.4		1	2	3	4
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	_	0.0	4.0	4.0	_	4.0	\		sta.	_	7
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2		1.2		- 6	0	7	-
Timer Results				EBI	_	EBT	WB	L	WBT	NBI	L	NBT	SBI	L	SBT
Assigned Phase	е			3	_	8	7	\rightarrow	4	1	\rightarrow	6	5	\rightarrow	2
Case Number				1.1	-	4.0	1.1	-	3.0	1.1	$\overline{}$	4.0	1.1	-	4.0
Phase Duration	hase Duration, s			12.7	-	24.5	10.8	_	22.6	11.9	_	26.2	10.6	-	24.9
Change Period,	hange Period, (Y+Rc), s			5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Head	dway (/	MAH), s		3.1		3.1	3.1		3.1	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	(gs), S		7.4		17.9	4.3		10.4	6.2		19.2	3.9		14.0
Green Extensio	n Time	(ge), S		0.3		1.3	0.1		1.4	0.3		1.8	0.1		0.0
Phase Call Prof	bability			0.97	7	1.00	0.80	0	1.00	0.96	5	1.00	0.77	7	1.00
Max Out Probal	bility			0.00		0.00	0.00	0	0.00	0.00		0.09	0.00)	1.00
Movement Gro	un Res	ults			EB			WB			NB			SB	
Approach Move	•	Juito		L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow F) woh/h		181	410	10	80	246	78	155	468	455	72	344	324
			n		_			_	_						_
		ow Rate (s), veh/h/l	П	1767	1777 15.9		1767	1856 8.4	1572	1838	1856	1801	1838	1856	1734
Queue Service				5.4 5.4	15.9		2.3	8.4	2.9	4.2	17.2 17.2	17.2	1.9	11.9 11.9	12.0
Cycle Queue C		e mile (gr), s			0.27		_	0.24				0.29		0.27	_
Green Ratio (g				0.35			0.32	448		0.37	0.29 544		0.35		0.27
Capacity (c), v		Hin ()()		425	476		257			357		528	254	510	477
Volume-to-Capa			`	0.426	0.862		0.311	0.549		0.434	0.861	0.861	0.285	0.674	0.678
		t/ln (95 th percentile		94	272		41	160	_	75	272	260	35	210	196
	· · · · ·	eh/In (95 th percenti RQ) (95 th percent		3.7 0.52	10.6 0.00		1.6 0.36	0.00	0.40	2.9 0.75	0.00	0.00	1.4 0.29	0.00	7.9 0.00
Uniform Delay (iie)	17.8	25.2		19.4	23.9	_	17.0	24.1	24.1	18.4	23.3	23.3
				0.3	2.1		0.3	0.4	-	0.2	1.8	1.9	0.2	2.0	2.3
	ncremental Delay (d 2), s/veh nitial Queue Delay (d 3), s/veh				0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ontrol Delay (d), s/veh				27.3		19.7	24.3		17.2	25.9	26.0	18.6	25.3	25.6
	evel of Service (LOS)				C C		19.1 B	C C	C C	B	C C	C C	B	C C	C C
	pproach Delay, s/veh / LOS				Ť	С	22.9		C	24.7		С	24.8		C
	tersection Delay, s/veh / LOS						4.4		Ü	24.1			C 24.0		-
Multimodal Re	ultimodal Results				EB			WB			NB			SB	
Pedestrian LOS	destrian LOS Score / LOS				3	В	2.28	8	В	2.10)	В	1.92	2	В
_	cycle LOS Score / LOS				3	Α	1.15	5	Α	1.20	1	Α	1.21		Α

Table 74. Pennsylvania Ave and JFK Rd Tuesday 4-5PM HCS 5 Year Projected Conditions Optimized

		HCS	Sigr	nalize	d Int	ersect	ion R	esul	ts Sun	nmary	,				
										-					
General Inforn	nation								Intersec	tion Inf	ormatio	on	1	d.ke.	يا او
Agency									Duration	, h	1.000)		4.1	
Analyst				Analys	sis Dat	e 2/15/2	2024		Area Typ	e	Other	г	4		
Jurisdiction				Time F	Period				PHF		1.00		3 ₹		÷
Urban Street		John F Kennedy		Analys	sis Yea	r 2024			Analysis	Period	1> 12	2:00	7		
Intersection		4-5pm Penn/JFK		File N		$\overline{}$	DAY In	tersec	tion (Pen		_				
Project Descrip	tion			1						,_		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	-	4144	21
Demand Inform	nation				EB			W	В		NB			SB	
Approach Move	ement			L	T	R	L	T	R	L	Т	R	L	T	R
Demand (v), v	eh/h			181	309	101	80	24	6 78	124	678	61	85	637	148
0:	4:						1 11:								
Signal Informa		Deference Phase	2	-	1 6		215		<u>بل</u>	3	₩.			7	→
Cycle, s	74.4	Reference Phase	2	-	5	1 51	7 1	7	ř R	R		1	2	3	
Offset, s	102	Reference Point	End	Green		1.3	21.7	5.7		17.4	4				
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	-	0.0	4.0	4.0		4.0	`	×	Ψ		4
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		6	0	7	Y :
Timer Results				EBI		EBT	l wa		WBT	NB		NBT	SBI		SBT
Assigned Phas				3		8	7	-	4	1	-	6	5		2
	ase Number			1.1	_	4.0	1,1		3.0	1.1		4.0	1.1	_	4.0
	nase Duration, s						-	-			_			-	
	nase Duration, s nange Period, (Y+R c), s			13.1 5.2	-	24.8 5.2	10.9 5.2	_	5.2 5.2	11.9 5.2	$\overline{}$	28.0 5.1	10.7 5.2	-	26.8 5.1
	nange Period, (Y+R c), s ax Allow Headway (MAH), s			3.1	-	3.1	3.1	-	3.1	3.1	-	3.1	3.1	-	3.1
Queue Clearan				7.6		18.5	4.4	-	10.8	6.3	-	19.5	3.9	-	14.1
Green Extension				0.3	-	0.8	0.1	\rightarrow	0.6	0.3	-	3.3	0.1	-	3.4
Phase Call Pro		(9=), 5		0.98	-	1.00	0.8	-	1.00	0.96	$\overline{}$	1.00	0.78	-	1.00
Max Out Proba				0.00	_	0.00	0.0	_	0.94	0.00		0.02	0.00	_	0.00
THE COLL TODA				0.00			-		0.01	0.0			0.00		
Movement Gro	oup Res	sults			EB			WB			NB			SB	
Approach Move	ement			L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move	ment			3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow I	Rate (v), veh/h		181	410		80	246	78	155	468	455	72	344	324
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1767	1777		1767	1856	1572	1838	1856	1801	1838	1856	1734
Queue Service	Time (g s), S		5.6	16.5		2.4	8.8	3.0	4.3	17.5	17.5	1.9	12.1	12.1
Cycle Queue C	learanc	e Time (g ε), s		5.6	16.5		2.4	8.8	3.0	4.3	17.5	17.5	1.9	12.1	12.1
Green Ratio (g	/C)			0.34	0.26		0.31	0.23	0.23	0.39	0.31	0.31	0.37	0.29	0.29
Capacity (c), v	/eh/h			418	469		249	435	369	368	574	557	263	543	508
Volume-to-Cap	acity Ra	atio (X)		0.433	0.874		0.322	0.56	5 0.212	0.421	0.816	0.816	0.275	0.633	0.637
		t/In (95 th percentile)	100	283		44	174		76	275	262	35	207	192
		eh/ln (95 th percenti		3.9	11.1		1.7	6.8	1.9	3.0	10.7	10.5	1.4	8.1	7.7
		RQ) (95 th percent		0.55	0.00		0.38	0.00	-	0.76	0.00	0.00	0.29	0.00	0.00
Uniform Delay				18.7	26.4		20.5	25.3		16.7	23.9	23.9	18.1	23.0	23.0
	cremental Delay (d 2), s/veh				2.1		0.3	1.1	0.1	0.2	0.7	0.8	0.2	0.3	0.4
Initial Queue De	itial Queue Delay (d ɔ), s/veh				0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (19.0	28.5		20.8	26.4	23.2	16.9	24.6	24.6	18.3	23.3	23.4
Level of Service	e (LOS)			В	С		С	С	С	В	С	С	В	С	С
	pproach Delay, s/veh / LOS				5	С	24.	7	С	23.5	5	С	22.9		С
Intersection De							3.9						С		
	ultimodel Deculte														
	ultimodal Results				EB			WB			NB			SB	
	destrian LOS Score / LOS				3	В	2.2	-	В	2.10	_	В	1.91	\rightarrow	В
Bicycle LOS So	cycle LOS Score / LOS				3	Α	1.1	5	Α	1.20	0	Α	1.21	1	Α

Table 75. Pennsylvania Ave and JFK Rd Tuesday 5-6PM HCS 5 Year Projected Conditions

		HCS	Sigr	nalize	d Inte	ersect	ion R	esult	ts Sun	nmary	,				
Comment	4:								,		4:			d.los.	VIII
General Inforn	nation							\rightarrow	Intersec		_		- i	424	
Agency								\rightarrow	Duration,		1.000				
Analyst				Analys	sis Date	2/15/2	2024		Area Typ	е	Other		_ i		
Jurisdiction				Time F	Period				PHF		1.00				=
Urban Street		John F Kennedy		Analys	sis Year	2024			Analysis	Period	1> 12	:00	1		
Intersection		5-6pm Penn/JFK		File Na	ame	TUES	DAY Int	ersect	ion (Peni	n-JFK)_	5YEAR	projec		515	
Project Descrip	tion												7	414	21
Demand Inforr	nation				EB			WE	2		NB			SB	
Approach Move				L	T	R	1	T	_	1	T	R	1	T T	R
				189	334	117	104	_	_	140	799	82	108	682	183
Demand (v), v	enim		-	109	334	1117	104	20.	5 90	140	799	02	100	002	103
Signal Informa	ition				7	\top	215	2	2	2	≥ .	راد	L I		>
Cycle, s	75.6	Reference Phase	2	J	7	50	z 51	2Ľ		ĸ	€	\	-	- ∕` ,	Y
Offset, s	0	Reference Point	End	Green	5 7	0.9	20.2	6.2	1.6	20.2			2	3	4
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	4.0		4.0	_ (KŤ2		7
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		6	0	7	-
Timer Results				EBI	L	EBT	WB	L	WBT	NB	L	NBT	SBI	_	SBT
Assigned Phas	-			3	_	8	7	_	4	1		6	5		2
Case Number				1.1	\perp	4.0	1.1	\perp	3.0	1.1		4.0	1.1		4.0
Phase Duration				13.1		27.1	11.4	1	25.4	11.8	$\overline{}$	26.2	10.9	-	25.3
Change Period	nge Period, (Y+R ε), s			5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Hea	dway (/	ИАН), s		3.1		3.1	3.1		3.1	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	(gs), S		7.7		20.4	5.1		11.2	6.0		19.4	4.3		14.2
Green Extension	n Time	(ge), S		0.3		1.4	0.1		1.6	0.2		1.7	0.1		0.0
Phase Call Pro	bability			0.98	3	1.00	0.89	9	1.00	0.95	5	1.00	0.82	2	1.00
Max Out Proba	bility			0.00		0.02	0.00)	0.00	0.00		0.08	0.00		1.00
Movement Gro	un Dos	vulte			EB			WB			NB			SB	
Approach Move		Suits		L	T	R		T	T R		T	R	L	T	R
				3	8	18	_	_	14	1	6	16	5	2	12
Assigned Move						18	7	4							
Adjusted Flow I				189	451	-	104	263	90	140	448	433	80	332	310
		ow Rate (s), veh/h/l	n	1767	1773		1767	1856	1111	1838	1856	1794	1838	1856	1720
Queue Service				5.7	18.4	-	3.1	9.2	3.4	4.0	17.4	17.4	2.3	12.1	12.2
Cycle Queue C		e Time (gε), s		5.7	18.4	-	3.1	9.2	3.4	4.0	17.4	17.4	2.3	12.1	12.2
Green Ratio (g				0.37	0.29	-	0.35	0.27	0.27	0.36	0.28	0.28	0.34	0.27	0.27
Capacity (c), v				442	513	_	260	497	421	343	519	502	250	496	460
Volume-to-Cap		_ ` '		0.428	0.879		0.401	0.529	0.214	0.408	0.863	0.863	0.321	0.669	0.674
		t/In (95 th percentile	,	100	324		55	176	54	74	310	295	42	215	200
Back of Queue	(Q), v	eh/ln (95 th percenti	le)	3.9	12.6		2.1	6.9	2.1	2.9	12.1	11.8	1.6	8.4	8.0
		RQ) (95 th percent	ile)	0.55	0.00		0.48	0.00		0.74	0.00	0.00	0.35	0.00	0.00
	niform Delay (d 1), s/veh			17.4	25.7		19.6	23.7	_	18.2	25.9	25.9	19.6	24.8	24.8
	cremental Delay (d 2), s/veh			0.2	5.8		0.4	0.3	0.1	0.3	3.2	3.4	0.2	2.0	2.3
Initial Queue D				0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/v	eh		17.7	31.5		20.0	24.0	21.6	18.5	29.1	29.3	19.8	26.7	27.1
Level of Service	vel of Service (LOS)			В	С		В	С	С	В	С	С	В	С	С
Approach Delay	proach Delay, s/veh / LOS			27.4	1	С	22.0	6	С	27.7	7	С	26.1	1	С
Intersection De	ersection Delay, s/veh / LOS					20	6.4						С		
Multimodal Do	eulte				EB			WB			NB			SB	
	timodal Results			2.20	_	В	2.20	_		2 44	_	В	1.00	_	В
	estrian LOS Score / LOS			2.28	-		2.28	-	В	2.11	\rightarrow		1.92	-	
Dicycle LOS So	cle LOS Score / LOS			1.54	+	В	1.24	+	Α	1.33)	Α	1.29	,	Α

Table 76. Pennsylvania Ave and JFK Rd Tuesday 5-6PM HCS 5 Year Projected Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	tion R	esul	ts Sun	nmary	,				
								Ļ							
General Inforn	nation							\rightarrow	Intersec				- i	476	
Agency								\rightarrow	Duration		1.000		- 200		
Analyst				Analys	sis Dat	e 2/15/	2024		Area Typ	е	Other		_ _		L.
Jurisdiction				Time F	Period				PHF		1.00				7
Urban Street		John F Kennedy		Analys	sis Yea	r 2024			Analysis	Period	1> 12	:00	=		
Intersection		5-6pm Penn/JFK		File Na	ame	TUES	DAY Int	tersect	ion (Pen	n-JFK)_	5YEAR	projec		515	
Project Descrip	tion												7	4144	21
Demand Inform	nation				EB			WI	3		NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	T	ΤT	R	L	Т	R
Demand (v), v				189	334		104	_		140	799		108	682	183
Signal Informa	ation										2				
Signal Informa	_	Potorones Phase	2	1	1 2		1215		7	3	;			7	→
Cycle, s	79.1	Reference Phase		1	5	1 51	7l M	71	F	R		1	2	3	-
Offset, s	110	Reference Point	End	Green		0.8	22.6	6.4	_	20.7					
Uncoordinated		Simult. Gap E/W	On	Yellow		0.0	4.0	4.0		4.0	`	-	V	✓.	↔
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		6	0	7	7
Timer Results				EBI		EBT	WB	L	WBT	NB		NBT	SBI		SBT
Assigned Phas	e			3	\neg	8	7	\neg	4	1	\neg	6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	nase Duration, s			13.6	;	27.9	11.6	3	25.9	11.9	,	28.6	11.1		27.7
	ase Duration, s ange Period, (Y+R c), s			5.2	-	5.2	5.2	_	5.2	5.2	-	5.1	5.2	-	5.1
Max Allow Hea		**		3.1	_	3.1	3.1	\neg	3.1	3.1	-	3.1	3.1	-	3.1
Queue Clearan	ce Time	e (g s), S		8.0		21.4	5.3		11.8	6.1		19.9	4.3		14.6
Green Extension				0.3	\neg	0.9	0.2		1.2	0.2	\neg	3.2	0.1		3.2
Phase Call Pro				0.99		1.00	0.90	0	1.00	0.96	5	1.00	0.83	3	1.00
Max Out Proba				0.00	-	0.00	0.00	_	0.18	0.00	_	0.00	0.00	_	0.00
Movement Gro	un Doe	ulte			EB			WB			NB			SB	
Approach Move		Suits		L	T	R	L	T	R	L	T	R	L	T	R
				3	8	18	7	4	14	1	6	16	5	2	12
Assigned Move		A comb fb				10	-	<u> </u>		_					
Adjusted Flow I				189	451	-	104	263	90	140	448	433	80	332	310
		ow Rate (s), veh/h/l	n	1767	1773	-	1767	1856		1838	1856	1794	1838	1856	1720
Queue Service				6.0	19.4	-	3.3	9.8	3.6	4.1	17.9	17.9	2.3	12.4	12.6
Cycle Queue C		e πme (g ε), s		6.0	19.4		3.3	9.8	3.6	4.1	17.9	17.9	2.3	12.4	12.6
Green Ratio (g				0.37	0.29		0.35	0.26		0.38	0.30	0.30	0.37	0.29	0.29
Capacity (c), v		E- /)/)		437	513		253	486	412	356	553	535	260	534	495
Volume-to-Cap				0.432	0.880	-	0.412			0.394	0.810	0.810	0.309	0.622	0.627
		t/In (95 th percentile		107	322		60	192		77	308	294	43	215	199
		eh/ln (95 th percenti	-	4.2	12.6		2.3	7.5	2.3	3.0	12.1	11.7	1.7	8.4	8.0
		RQ) (95 th percent	ile)	0.59	0.00		0.52	0.00	_	0.77	0.00	0.00	0.36	0.00	0.00
	niform Delay (d 1), s/veh cremental Delay (d 2), s/veh			18.5 0.3	27.1		21.0 0.4	25.4 0.7	0.1	18.2 0.3	26.0	26.0	19.6 0.2	0.3	24.8 0.4
	tial Queue Delay (d s), s/veh			0.0	0.0	_	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (•		18.8	29.2		21.4	26.1	$\overline{}$	18.5	27.1	27.1	19.8	25.1	25.1
				B	C C		C C	C	C C	B	C C	C C	B	C C	C C
	evel of Service (LOS) oproach Delay, s/veh / LOS			26.1		С	24.4		C	25.9		C	24.5		C
	tersection Delay, s/veh / LOS			20.			5.4			25.5			C 24.5		
	ultimodal Deculte														
	Iltimodal Results				EB			WB			NB			SB	
Pedestrian LOS	lestrian LOS Score / LOS				3	В	2.28	3	В	2.11		В	1.92	2	В
Bicycle LOS So	cle LOS Score / LOS				1	В	1.24	4	Α	1.33	3	Α	1.29)	Α

Table 77. Wacker Dr and JFK Rd Tuesday 11AM-Noon HCS 5 Year Projected Conditions

		HCS	Sigr	nalize	d Inte	rsect	ion R	esu	ılts Sun	nmary	,				
									1						
General Inforn	nation								Intersec		_		- i	4.10.	34 IL
Agency									Duration	,	1.000				
Analyst				Analys	sis Date	2/20/2	2024		Area Typ	e	Other				
Jurisdiction				Time F	Period				PHF		1.00		34		7
Urban Street		Wacker/JFK		Analys	sis Year	2024			Analysis	Period	1> 7:0	00			
Intersection		Wacker/JFK 11AM-	NOON	File Na	ame	TUES	DAY Int	erse	ction (Wad	ker-JFK	()_5YEA	Rproj		515	
Project Descrip	tion	Wacker/JFK TUES	DAY										7	414**	21
Demand Inform	nation				EB			V	VB	1	NB		1	SB	
Approach Move				L	T	□ R	1	_	T R	1	T	R	1	T	R
Demand (v), v				301	6	51	6	-	2 8	81	519	5	14	406	224
Demand (v), v	CII/II			301		31	•	÷	2 0	01	319	, J	14	400	224
Signal Informa	ition				7	\top	215	Τ,	. 5	\top	l				_
Cycle, s	50.5	Reference Phase	2		7	150	al 50	ηĘ.				Y	Ψ		♣.
Offset, s	0	Reference Point	End	Green	0.7	3.8	15.0	8.	3 1.2	0.0		-	2	ō	¥ .
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	_	0 3.0	0.0				7	→
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2		0.0		6	0	7	
T												NDT.			007
Timer Results				EBI	L	EBT	WB	_	WBT	NBI	L	NBT	SBI	-	SBT
Assigned Phase	<u> </u>			\vdash	_	4	_	_	8	5	\rightarrow	2	1		6
Case Number					\rightarrow	10.0		_	12.0	1.1	-	4.0	1.1		4.0
Phase Duration	<u> </u>					13.8		\Box	6.7	9.5	_	24.3	5.7		20.5
	ange Period, (Y+R c), s					5.5		_	5.5	5.0		5.5	5.0		5.5
Max Allow Hea	dway (/	MAH), s				3.2			3.2	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	e (gs), s				7.6			2.2	4.9		13.6	2.2		7.9
Green Extension	n Time	(ge), S				0.7			0.0	0.2		3.2	0.0		3.2
Phase Call Pro	bability					0.99		\neg	0.20	0.89)	1.00	0.15	5	1.00
Max Out Proba	bility					0.00			0.00	0.00)	0.00	0.00		0.00
Movement Gro	un Res	sults			EB			W	R		NB			SB	
Approach Move		Junto		L	T	R	L	Τ̈́		L	T	R	L	T	R
Assigned Move				7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow I		/ \ woh/h		151	208	14	8	-	8	157	507	505	11	264	240
				_	1762		1831	_	1610	1810	1900	1893	1810	1900	1675
Queue Service		ow Rate (s), veh/h/l	11	1810 3.8	5.6		0.2		0.2	2.9	11.6	11.6	0.2	5.7	5.9
		gs), s e Time (gc), s		3.8	5.6		0.2		0.2	2.9	11.6	11.6	0.2	5.7	5.9
-		e fille (yt), s		0.16	0.16		0.2		0.02	0.40	0.37	0.37	0.2	0.30	0.30
Green Ratio (g									_	_					
Capacity (c), v		-ti- ()()		298	290		44		39	467	706	704	226	564	497
Volume-to-Cap			,	0.505	0.716		0.182		0.206	0.335	0.718	0.718	0.049	0.469	0.482
		t/ln (95 th percentile	,	66	96		4		4	41	161	161	3	95	86
		eh/ln (95 th percenti		2.6	3.8		0.2		0.2	1.6	6.4	6.4	0.1	3.8	3.5
		RQ) (95 th percent	ile)	0.13	0.19		0.09		0.10	0.21	0.32	0.32	0.05	0.19	0.17
Uniform Delay	<u> </u>			19.2	20.0		24.2		24.2	10.4	13.6	13.6	13.0	14.5	14.6
Incremental De		**		0.5	1.3		0.7		1.0	0.1	0.3	0.3	0.0	0.2	0.2
Initial Queue De		•		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (19.7	21.3		24.9		25.2	10.5	13.9	13.9	13.1	14.7	14.8
Level of Service				В	С		С	Ц,	С	В	В	В	В	В	В
Approach Delay	y, s/veh	/LOS		20.6	6	С	25.0)	С	13.4	4	В	14.7		В
Intersection De	lay, s/ve	eh / LOS				15	5.1						В		
Multimodal Re	Itimodal Results				EB			W	R		NB			SB	
	destrian LOS Score / LOS			2.28	_	В	2.29	_	В	1.89		В	2.09		В
	estrian LOS Score / LOS cle LOS Score / LOS			_	\rightarrow		_	\rightarrow		_	-		_	\rightarrow	
Dicycle LOS Sc	ore / LC	Jo		1.08)	Α	0.50	_	Α	0.99	1	Α	1.02		Α

Table 78. Wacker Dr and JFK Rd Tuesday 11AM-Noon HCS 5 Year Projected Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	ion R	esu	Its Sur	nmary	,				
General Inform	nation								Intersec	tion Inf	ormatio	on	1	420.	يا ي
Agency									Duration	, h	1.000			1.1	
Analyst				Analys	is Date	2/20/2	024		Area Typ	ре	Other		4		
Jurisdiction				Time F	eriod				PHF		1.00		34		7
Urban Street		Wacker/JFK		Analys	is Year	2024			Analysis	Period	1> 7:0	00	1		
Intersection		Wacker/JFK 11AM-	NOON	File Na		-	DAY Int	erse	tion (Wad) 5YEA	ARproi			
Project Descrip	tion	Wacker/JFK TUESI				1			(/		- 6	4144	7-1
Demand Inform	nation				EB		$\overline{}$	V	/B	\top	NB		\top	SB	
Approach Move	ement				Т	T R	L	т.	T R	L	ΤT	□ R	1 .	Т	TR
Demand (v), v	eh/h			301	6	51	6	1 :	2 8	81	519	5	14	406	22
										_					
Signal Informa	tion				T,	\top	215	т	5_	\top					
Cycle, s	50.1	Reference Phase	2	1	"c	E.A.		ĸ	Ħ		•	Y	Ψ		
Offset, s	0	Reference Point	End		1 7	127						1	2	3	A
Uncoordinated	Yes	Simult. Gap E/W	On	Green Yellow		0.0	15.0 4.0	7.		0.0				,	4
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.		0.0) [-
. Stee Wiede	1 IXOU	Sandit. Oup 1970	Oll	1100	1.0	0.0	1.0		- 2.5	10.0					
Timer Results				EBI		EBT	WBI		WBT	NB		NBT	SBI		SBT
	0			EBI		4	VVDI	+	8	5		2	1		6
Assigned Phase	t					10.0		-	12.0	1.1		4.0	1.1		4.0
Case Number					-		-	-		-	-			-	
	ase Duration, s ange Period (Y+R c) s					13.4		4	6.7	9.5	_	24.2	5.7	-	20.5
	ange Period, (Y+R c), s			_	_	5.5	_	_	5.5	5.0	-	5.5	5.0	-	5.5
Max Allow Head						3.2	\vdash	\rightarrow	3.2	3.1	-	3.1	3.1	-	3.1
Queue Clearan	ce Time	(gs), S			\perp	7.6		_	2.2	4.8	-	13.4	2.2	-	7.9
Green Extensio	n Time	(ge), S				0.3		_	0.0	0.1	-	3.2	0.0		3.2
Phase Call Pro	bability					0.99			0.20	0.89	9	1.00	0.14	1	1.00
Max Out Proba	bility					0.45		\perp	0.00	0.10)	0.00	0.00)	0.00
Movement Gro	un Res	ults			EB			W	3		NB			SB	
Approach Move				L	T	R		T	R	L	T	R	L	T	R
Assigned Move				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow F		\ veh/h		151	208	14	8	0	8	156	506	505	11	264	24
				$\overline{}$	1762		_				1900	1893	1810		-
-		ow Rate (s), veh/h/l	II	1810			1831		1610	1810			1212	1900	167
Queue Service				3.8	5.6		0.2		0.2	2.8	11.4	11.4	0.2	5.7	5.9
Cycle Queue C		e πme (gε), S		3.8	5.6		0.2		0.2	2.8	11.4	11.4	0.2	5.7	5.9
Green Ratio (g				0.16	0.16		0.02		0.02	0.40	0.37	0.37	0.31	0.30	0.3
Capacity (c), v				287	280		44		39	472	710	708	230	569	50
Volume-to-Cap				0.524	0.741		0.181		0.206	0.331	0.713		0.049	0.465	0.4
		t/In (95 th percentile		66	96		4		4	40	158	158	3	93	85
Back of Queue	(Q), ve	eh/In (95 th percenti	le)	2.6	3.9		0.2		0.2	1.6	6.3	6.3	0.1	3.7	3.4
Queue Storage	Ratio (RQ) (95 th percent	ile)	0.13	0.19		0.09		0.09	0.21	0.32	0.32	0.05	0.19	0.1
Uniform Delay ((d 1), s	/veh		19.4	20.1		24.0		24.0	10.3	13.4	13.4	12.8	14.3	14.
Incremental De	cremental Delay (d 2), s/veh				1.5		0.7		1.0	0.1	0.3	0.3	0.0	0.2	0.2
	itial Queue Delay (d ɔ), s/veh				0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ontrol Delay (d), s/veh				21.6		24.7		25.0	10.4	13.7	13.7	12.9	14.5	14.
Level of Service				19.9 B	C		С		С	В	В	В	В	В	В
	pproach Delay, s/veh / LOS					С	24.8		C	13.2		В	14.5	_	В
	tersection Delay, s/veh / LOS						5.0		<u> </u>	13.4			B		-
craccilon De	ay, arve	200				15									
Multimodal Re	sults				EB			W	3		NB			SB	
	destrian LOS Score / LOS				_			_							
	Score	/LOS		2.28	}	В	2.29		В	1.89)	В	2.09)	В

Table 79. Wacker Dr and JFK Rd Tuesday 4-5PM HCS 5 Year Projected Conditions

		HCS	S Sigr	nalize	d Inte	ersect	ion R	esu	lts Sun	nmary	,				
Canaral Inform	nation								Interne	tion Inf	armatic			dle.	KT.
General Inform	nation								Intersec		_		ı i		
Agency									Duration	,	1.000				
Analyst						e 2/20/2	2024		Area Typ	e	Other	·	_===		,
Jurisdiction				Time F	Period				PHF		1.00		- B		7
Urban Street		Wacker/JFK		Analys	sis Yea	r 2024			Analysis	Period	1> 7:0	00	-		
Intersection		Wacker/JFK 4-5PM	l	File Na	ame	TUES	DAY Int	erse	ction (Wad	ker-JFk	()_5YE	Rproj		5 1 3	
Project Descrip	tion	Wacker/JFK TUESI	DAY										1	4145	21
Demand Inform	nation				EB			V	/B		NB			SB	
Approach Move				L	Τ	R	1	_	T R	1	T	R	1	T	R
				365	2	66	5	-	9 6	100	_	5	21	482	224
Demand (v), v	ren/m		-	303		00	3		9 0	100	010	3	21	402	224
Signal Informa	ation				7	\top	215	Ι,	. ⊱	\top	π				_
Cycle, s	51.6	Reference Phase	2	ı	5	51	al 50	₽Ħ				7	\mathbf{Y}		- ♦.
Offset, s	0	Reference Point	End	Green	0.6	3.2	15.0	9.	8 1.5	0.0		1		٥	- H
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	-	0.0	4.0	3.		0.0	-		N .	7	→
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.		0.0		6	0	7	_
Timer Results				EBI	L	EBT	WB	L	WBT	NB	L	NBT	SBI	-	SBT
Assigned Phase	е					4			8	5		2	1		6
Case Number						10.0			12.0	1.1		4.0	1.1		4.0
Phase Duration						15.3		\neg	7.0	8.8		23.7	5.6		20.5
Change Period	ange Period, (Y+R c), s					5.5			5.5	5.0		5.5	5.0		5.5
Max Allow Hea	dway (/	MAH), s				3.3		\neg	3.2	3.1		3.1	3.1	\neg	3.1
Queue Clearan						9.0		\neg	2.3	3.9	-	8.5	2.2	-	5.4
Green Extension				_	_	0.9		_	0.0	0.1	-	1.7	0.0	-	1.7
Phase Call Pro		(g e), 3		_		1.00		_	0.25	0.76	_	1.00	0.12	\rightarrow	1.00
Max Out Proba					+	0.00		-	0.23	0.00	_	0.00	0.12	_	0.00
Movement Gro		sults		_	EB	,	_	W	_	_	NB			SB	
Approach Move				L	T	R	L	T		L	T	R	L	T	R
Assigned Move	ment			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow I	Rate (v), veh/h		183	251		10		10	100	311	310	9	154	145
Adjusted Satura	ation Flo	ow Rate (ε), veh/h/l	In	1810	1757		1856		1706	1810	1900	1895	1810	1900	1700
Queue Service	Time (g s), S		4.7	7.0		0.3		0.3	1.9	6.5	6.5	0.2	3.2	3.4
Cycle Queue C	learanc	e Time (g c), s		4.7	7.0		0.3		0.3	1.9	6.5	6.5	0.2	3.2	3.4
Green Ratio (g	/C)			0.19	0.19		0.03		0.03	0.37	0.35	0.35	0.30	0.29	0.29
Capacity (c), v	/eh/h			344	334		54		50	519	670	668	313	552	494
Volume-to-Cap		atio (X)		0.530	0.750		0.194		0.192	0.193	0.464	0.464	0.028	0.279	0.294
		t/ln (95 th percentile	<u>:</u>)	80	118		6		5	29	105	105	3	54	51
		eh/ln (95 th percenti		3.2	4.7		0.2		0.2	1.1	4.2	4.2	0.1	2.2	2.0
		RQ) (95 th percent		0.16	0.23		0.12		0.11	0.15	0.21	0.21	0.05	0.11	0.10
Uniform Delay		-77		18.8	19.7		24.5		24.5	11.0	12.9	12.9	12.9	14.1	14.2
	cremental Delay (d 2), s/veh			0.5	1.3		0.6		0.7	0.1	0.2	0.2	0.0	0.1	0.1
Initial Queue De	tial Queue Delay (d 3), s/veh			0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ontrol Delay (d), s/veh			19.3	21.0		25.1		25.2	11.1	13.1	13.1	12.9	14.2	14.3
Level of Service				В	С		С		С	В	В	В	В	В	В
	pproach Delay, s/veh / LOS			20.3		С	25.1		С	12.8		В	14.2		В
	ersection Delay, s/veh / LOS						5.5						В		
	Itimodal Results				EB			W			NB			SB	
Pedestrian LOS	estrian LOS Score / LOS)	В	2.29		В	1.89	9	В	2.09		В
Bicycle LOS So	cle LOS Score / LOS)	Α	0.50)	Α	1.08	3	Α	1.09)	Α

Table 80. Wacker Dr and JFK Rd Tuesday 4-5PM HCS 5 Year Projected Conditions Optimized

		HCS	S Sigr	nalize	d Inte	ersect	ion R	esu	Its Sur	nmary	,				
General Inform	nation								Intersec	tion Inf	ormatio	on	, i	A June 1	j. 1.
Agency									Duration	, h	1.000)		4.7	
Analyst				Analys	sis Date	2/20/2	024		Area Ty	ре	Other		A.		
Jurisdiction				Time F	Period				PHF		1.00		\$ *		- -
Urban Street		Wacker/JFK		Analys	sis Year	2024			Analysis	Period	1> 7:0	00	7		
Intersection		Wacker/JFK 4-5PM		File N		-	DAY Int	erse	tion (Wa) 5YEA	ARproi			
Project Descrip	tion	Wacker/JFK TUESI	DAY								-		7	4144	7 1
										_					
Demand Inform					EB			_	/B		NB		<u> </u>	SB	
Approach Move	ement			L	T	R	L	_	T R	L	T	R	L	T	R
Demand (v), v	eh/h			365	2	66	5	<u> </u>	9 6	100	616	5	21	482	224
Signal Informa	tion						1215		8		_				
Cycle, s	51.5	Reference Phase	2		2			. L	: 闰			<u>,</u>	₩		
Offset, s	0	Reference Point	End		()	517				1		1	2	3	Y
Uncoordinated	Yes	Simult. Gap E/W	On	Green	-	3.2	15.0	9.		0.0			k l		4
Force Mode	Fixed	Simult. Gap N/S	On	Yellow Red	1.5	0.0	1.5	3. 2.		0.0) [~
i orce wioue	rixed	Official Coap 19/0	Oll	IVen	11.0	0.0	1.0	14.	0 [2.3	10.0					
Timer Results				EBI	L	EBT	WB	L	WBT	NB	L	NBT	SBI	L	SBT
Assigned Phase	е					4			8	5		2	1		6
Case Number						10.0			12.0	1.1		4.0	1.1		4.0
Phase Duration	nase Duration, s					15.2		\neg	7.0	8.8		23.7	5.6		20.5
Change Period,	nange Period, (Y+R c), s					5.5			5.5	5.0		5.5	5.0		5.5
Max Allow Head	nange Period, (Y+R c), s ax Allow Headway (MAH), s					3.3		\neg	3.2	3.1	-	3.1	3.1	-	3.1
Queue Clearan						9.0		\rightarrow	2.3	3.9	_	8.5	2.2	_	5.4
Green Extensio		12 //				0.7		\rightarrow	0.0	0.0	-	1.7	0.0	-	1.7
Phase Call Prol		(91,0		_		1.00	_	\rightarrow	0.25	0.76	-	1.00	0.12	-	1.00
Max Out Probal					_	0.01	_	7	0.00	1.00	_	0.00	0.00	-	0.00
Movement Gro		sults			EB			W	_	_	NB			SB	
Approach Move	ement			L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move	ment			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow F	Rate (v), veh/h		183	251		10		10	100	311	310	9	154	145
Adjusted Satura	ation Flo	ow Rate (ε), veh/h/l	n	1810	1757		1856		1706	1810	1900	1895	1810	1900	170
Queue Service	Time (g s), S		4.7	7.0		0.3		0.3	1.9	6.5	6.5	0.2	3.2	3.4
Cycle Queue C	learanc	e Time (g ε), s		4.7	7.0		0.3		0.3	1.9	6.5	6.5	0.2	3.2	3.4
Green Ratio (g	/C)			0.19	0.19		0.03		0.03	0.37	0.35	0.35	0.30	0.29	0.29
Capacity (c), v	/eh/h			341	332		55		50	520	671	669	314	553	495
Volume-to-Capa	acity Ra	atio (X)		0.534	0.755		0.192		0.189	0.192	0.463	0.463	0.028	0.278	0.29
Back of Queue	(Q), f	t/ln (95 th percentile	!)	80	118		6		5	28	104	104	3	54	51
		eh/ln (95 th percenti	_	3.2	4.7		0.2		0.2	1.1	4.2	4.2	0.1	2.1	2.0
Queue Storage	Ratio (RQ) (95 th percent	tile)	0.16	0.24		0.12		0.11	0.15	0.21	0.21	0.05	0.11	0.1
Uniform Delay (18.9	19.8		24.4		24.4	11.0	12.9	12.9	12.9	14.1	14.
Incremental De	cremental Delay (d 2), s/veh			0.5	1.3		0.6		0.7	0.1	0.2	0.2	0.0	0.1	0.1
	itial Queue Delay (d ɔ), s/veh				0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (0.0 19.4	21.1		25.1		25.1	11.1	13.1	13.1	12.9	14.2	14.
	evel of Service (LOS)			В	С		С		С	В	В	В	В	В	В
	pproach Delay, s/veh / LOS			20.4	4	С	25.1		С	12.8	3	В	14.2	2	В
	tersection Delay, s/veh / LOS						5.5						В		
	None del Besselfe														
Multimodal Re	Iltimodal Results				EB			W	В		NB			SB	
Pedestrian LOS	destrian LOS Score / LOS			2.29)	В	2.29		В	1.89)	В	2.09	9	В
Bicycle LOS Sc	ore / Lo	os		1.20		Α	0.50		Α	1.08	3	Α	1.09	9	Α

Table 81. Wacker Dr and JFK Rd Tuesday 5-6PM HCS 5 Year Projected Conditions

		HCS	Sigr	nalize	d Inte	rsect	ion R	esu	lts Su	nmary	,				
															-010
General Inform	nation									ction Inf			- i	410.	
Agency									Duration		1.000				
Analyst				Analys	is Date	2/20/2	024		Area Ty	pe	Other				
Jurisdiction				Time F	Period				PHF		1.00				7
Urban Street		Wacker/JFK		Analys	is Year	2024			Analysis	Period	1> 7:0	00	-		
Intersection		Wacker/JFK 5-6PM		File Na	ame	TUES	DAY Int	erse	ction (Wa	cker-JFK)_5YE/	ARproj		515	Г
Project Descrip	tion	Wacker/JFK TUESI	DAY										1	4144	21
Demand Inforr	nation				EB			V	/B		NB			SB	
Approach Move				L	T	R	1	_	T R	1	T	T R	1	T	R
Demand (v), v				394	2	55	9	-	8 11	115	634	_	8	410	22
Demand (v), v	CHIM			334		55		ė	0 11	110	054		•	410	
Signal Informa	tion				7		215	Τ,	. 🖫	\top	Π				_
Cycle, s	53.2	Reference Phase	2		7	Sti	2 SA	₽Ĕ	7				Ψ		-4
Offset, s	0	Reference Point	End	Green	0.3	4.1	15.0	1/	0.1 2.0	0.0		1	2	3	¥
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	3.			-			7	→
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.		0.0		5	0	7	
Timer Results				EBI	-	EBT	WB	L	WBT	NB	L	NBT	SBI		SBT
Assigned Phase	е					4		_	8	5	_	2	1	\rightarrow	6
Case Number						10.0		_	12.0	1.1		4.0	1.1		4.0
Phase Duration	hase Duration, s					15.6			7.5	9.5		24.7	5.3		20.5
Change Period,	hange Period, (Y+R ε), s					5.5			5.5	5.0		5.5	5.0		5.5
Max Allow Head	dway (/	MAH), s				3.3		\neg	3.2	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	e (gs), S				9.2			2.4	4.9		11.4	2.1		6.6
Green Extensio	n Time	(q e), S			\neg	0.9		\neg	0.0	0.2		2.3	0.0		2.3
Phase Call Prol		(3-7/-				1.00			0.34	0.89	,	1.00	0.07	7	1.00
Max Out Proba					_	0.00		\exists	0.00	0.00	_	0.00	0.00	_	0.00
Movement Gro	un Doc	ulte			EB			W	n.		NB			SB	
		Suits		L	T	R	L	T	R		T	R		T	R
Approach Move					_		3	_			_				_
Assigned Move				7	4	14	_	8	18		2	12	1	6	16
Adjusted Flow I				197	254		15		13	147	410	409	5	196	18
•		ow Rate (s), veh/h/l	n	1810	1767		1844		1654	1810	1900	1895	1810	1900	167
Queue Service				5.3	7.2		0.4		0.4	2.9	9.4	9.4	0.1	4.4	4.0
Cycle Queue C		e Time (gε), s		5.3	7.2		0.4		0.4	2.9	9.4	9.4	0.1	4.4	4.6
Green Ratio (g				0.19	0.19		0.04		0.04	0.39	0.36	0.36	0.29	0.28	0.2
Capacity (c), v	/eh/h			345	337		71		63	488	684	683	246	536	47
Volume-to-Cap	acity Ra	itio (X)		0.571	0.754		0.208		0.209	0.302	0.599	0.599	0.019	0.366	0.3
Back of Queue	(Q), f	t/In (95 th percentile)	90	124		8		7	43	146	146	2	75	69
Back of Queue	(Q), v	eh/In (95 th percenti	le)	3.6	4.9		0.3		0.3	1.7	5.8	5.8	0.1	3.0	2.
Queue Storage	Ratio (RQ) (95 th percent	tile)	0.18	0.25		0.18		0.16	0.22	0.29	0.29	0.03	0.15	0.1
	niform Delay (d 1), s/veh				20.3		24.8		24.8	11.2	13.9	13.9	14.0	15.3	15.
	cremental Delay (d 2), s/veh				1.3		0.5		0.6	0.1	0.2	0.2	0.0	0.1	0.
Initial Queue De				0.6	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.
Control Delay (••		20.1	21.6		25.3		25.4	11.3	14.1	14.1	14.0	15.4	15.
Level of Service				C	C		C		C	В	В	В	В	В	В
Approach Delay	<u> </u>			21.0		С	25.4		C	13.7		В	15.5		В
Intersection Delay				21.0			25.4 6.0		U	13.1			B 15.5	<u> </u>	ט
meracellon De	ay, arve	,,, LOO				10									
Multimodal Re	ıltimodal Results				EB			W	В		NB			SB	
	destrian LOS Score / LOS					В	2.29	_	В	1.89	_	В	2.09	_	В
Pedestrian LOS	ycle LOS Score / LOS					_		- 1	_			_			_

Table 82. Wacker Dr and JFK Rd Tuesday 5-6PM HCS 5 Year Projected Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	ion R	esu	ılts Su	mmar	у				
General Inforn	nation								Interse	ction Ir	formati	on	1 1	420.	pill.
Agency									Duratio	n, h	1.000)		4.1	
Analyst				Analys	sis Date	e 2/20/2	2024		Area T	/pe	Othe	r	- A		4
Jurisdiction				Time F					PHF		1.00		4		
Urban Street		Wacker/JFK				r 2024			1 1 11	s Period	$\overline{}$	00			-
Intersection		Wacker/JFK 5-6PM		File N			SDAY Int	erse	ction (Wa				-		
Project Descrip	tion	Wacker/JFK TUESI	1ΔΥ	T IIC IV	unio	TIOLO	,D, (1 1110	0100	CHOII (VVI	icker of	10,_012	п тргој	- 4	4142	20
1 Toject Descrip	tion	Wackeron K TOLOL	<i>7</i> 71												
Demand Inforr	nation				EB		$\overline{}$	V	VB	$\overline{}$	NB		$\overline{}$	SB	
Approach Move				L	Т	R	1	Т	T F	1	T	R	1	Т	R
Demand (v), v				394	2	55	9	_	8 1		_	_	8	410	224
2 2							_	Ė							
Signal Informa	ition				T,		215	Т	5_	$\overline{}$					
Cycle, s	53.1	Reference Phase	2	1	E	5.4		"E	; A			>	V		
Offset, s	0	Reference Point	End	L	()	1			9 1 2	<u>, , , , , , , , , , , , , , , , , , ,</u>		1	2	3	4
Uncoordinated	Yes	Simult. Gap E/W	On	Green Yellow		0.0	15.0 4.0	3.	0.1 2. 0 3.			、		,	\rightarrow
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2				6		7	8
7 0700 1110 000	· into d	Omnanii Gap rai G		1100	1.0	10.0									
Timer Results				EBI		EBT	WB	П	WBT	T N	31	NBT	SBI		SBT
Assigned Phas	ρ					4		_	8	5		2	1		6
	se Number			_		10.0			12.0	1	_	4.0	1.1	_	4.0
	ase Duration, s			_	_	15.6		-	7.5	9	_	24.6	5.3	_	20.5
Change Period		- \ 0		_	_	5.5	_	-	5.5	5.	_	5.5	5.0	-	5.5
					-	3.3	-	-	3.2	3.		3.1	3.1	_	3.1
Max Allow Hea				_	_		_	-		-	-		-	_	
Queue Clearan		12 //		<u> </u>	-	9.2	-	-	2.4	4.	_	11.3	2.1	-	6.6
Green Extension		(g e), S		_	-	0.9	-	_	0.0	0.	_	2.3	0.0	-	2.3
Phase Call Pro				_	_	1.00	-	_	0.34	0.8	_	1.00	0.07	-	1.00
Max Out Proba	bility			_	_	0.00		_	0.00	1.0	00	0.00	0.00)	0.00
Movement Gro	oup Res	sults			EB	_		W	В	$\overline{}$	NB			SB	
Approach Move				L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow I) veh/h		197	254		15	_	13	147	409	408	5	196	181
		ow Rate (s), veh/h/l	n	1810	1767		1844		165	_		1895	1810	1900	1678
Queue Service				5.3	7.2		0.4	_	0.4	2.9	9.3	9.3	0.1	4.4	4.6
		e Time (gε), s		5.3	7.2		0.4		0.4	2.9	9.3	9.3	0.1	4.4	4.6
Green Ratio (g		5 .ano (g t), 5		0.19	0.19		0.04		0.04			0.36	0.19	0.28	0.28
Capacity (c), v				344	336		71		64	487	684	682	246	537	474
		rtio / V \		0.572	0.755	_	0.208	_	0.20	_	_	0.599	0.019	0.365	0.382
Volume-to-Cap			١	90	123		8	-	7	43	145	144	2	75	69
		t/ln (95 th percentile			-	-	_		_	_		_			-
	* - **	eh/ln (95 th percenti		3.6	4.9		0.3		0.3	_	5.8	5.8	0.1	3.0	2.8
		RQ) (95 th percent	iie)	0.18	0.25		0.17		0.16			0.29	0.03	0.15	0.14
Uniform Delay				19.5	20.3		24.8		24.8	-	-	13.9	14.0	15.2	15.3
Incremental De				0.6	1.3		0.5		0.6	0.1	0.2	0.2	0.0	0.1	0.2
Initial Queue D		**		0.0	0.0		0.0		0.0		0.0	0.0	0.0	0.0	0.0
Control Delay (20.1	21.6		25.3		25.4	-		14.1	14.0	15.4	15.5
Level of Service				С	С		С	Ц,	С	В	В	В	В	В	В
	proach Delay, s/veh / LOS ersection Delay, s/veh / LOS			21.0) [С	25.3	3	С	13	.7	В	15.4	1	В
Intersection De	lay, s/ve	eh / LOS				1	6.0						В		
Multimadal Da	imodal Results				EB			101	D		ND			CD.	
				2.20	EB	D	2.20	W		4.4	NB	D	2.00	SB	D
	estrian LOS Score / LOS			2.29	_	B	2.29	\rightarrow	B	1.8	_	В	2.09	$\overline{}$	В
RICYCIE LOS SO	e LOS Score / LOS			1.23	5	Α	0.51		Α	1.1	11	Α	1.02	4	Α

Table 83. Pennsylvania Ave and JFK Rd Tuesday 11AM-Noon HCS 10 Year Projected Conditions

		HCS	s Sigr	ialize	a inte	ersect	ion R	esu	its Su	mma	ry					
General Inform	nation								Interse	ction I	nform	atio	n	Į,	43.00	БŲ
Agency									Duratio			000			4.7	
Analyst				Analys	sis Dat	e 2/15/2	024		Area T	-		her		2		
Jurisdiction				Time F		21 1012			PHF	, , ,	1.0			3 -7		Ξ
Urban Street		John F Kennedy				r 2024		_	Analys	is Perin	-	12:	00	4		•
Intersection		11am-12pm Penn/J	IFK	File Na			DAY Int	ersec	tion (Pe					-		
Project Descrip	tion	Train izpini oinii	,	111014	umo	11020	D/ (1 1111	.01000	1011 (1 0				.projo	-	বাক্ষ	21
Demand Inform	nation				EB			W	/R			NB			SB	
Approach Move				L	Τ	R	L	_	r F		_	T	R	L	T	R
Demand (v), v				181	208		93	_	69 10	_	_	669	77	89	637	162
Domana (v), v	OTHER PERSONS			101	200	120			, ,						001	102
Signal Informa		Deference Dhane			7		1215		2		, 😓	_			,	→
Cycle, s	72.7	Reference Phase	2		15	1 507	7 51	7	'B	F	3 "	•	1	2	3	•
Offset, s	0 Voc	Reference Point	End	Green		0.9	23.0	5.9			4.2	T				
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	4.0			0	1	•	Ψ		4
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	2 0.	ן נ	.2		6	0	7	¥
Timer Results				EBI	L	EBT	WB	L	WBT	I	IBL	١	NBT	SBI		SBT
Assigned Phase	e			3		8	7		4		1		6	5		2
Case Number				1.1		4.0	1.1		3.0		.1	4	4.0	1.1		4.0
Phase Duration	ı, S			13.2	2	21.5	11.1	1	19.4	1	2.0	2	9.0	11.1		28.1
Change Period,	hange Period, (Y+R c), s					5.2	5.2		5.2	1 5	.2	į	5.1	5.2		5.1
Max Allow Head	ax Allow Headway (MAH), s				\neg	3.2	3.1	\neg	3.2		3.1	:	3.1	3.1		3.1
Queue Clearan	ce Time	e (a s), S		7.8		15.1	4.9		7.9	1 6	.4	2	0.0	4.2		16.3
Green Extensio	n Time	(g e), S		0.3		1.1	0.1	\neg	1.2		1.3	- ;	3.9	0.1		2.9
Phase Call Prol	bability			1.00		1.00	0.88	5	1.00	0	.97	1	.00	0.83	3	1.00
Max Out Proba	bility			0.00		0.00	0.00		0.00	0	.00	0	.02	0.00		0.38
Movement Gro	un Dos	ulte			EB			WE	2	_	N	В			SB	
Approach Move		ruits		L	T	R	L	T	R	1	ΤÏ	_	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	_	16	5	2	12
Adjusted Flow F) veh/h		181	328	10	93	169				\rightarrow	481	89	414	385
		ow Rate (s), veh/h/l	ln .	1767	1741		1767	185		_	-	\rightarrow	1788	1838	1856	172
Queue Service				5.8	13.1		2.9	5.9	- 121				18.0	2.2	14.3	14.3
		e Time (gε), s		5.8	13.1		2.9	5.9				\rightarrow	18.0	2.2	14.3	14.3
Green Ratio (g		(g v), v		0.31	0.22		0.28	0.20		_	_	-	0.33	0.40	0.32	0.32
Capacity (c), v				434	390		261	362	_	_		_	589	279	587	546
Volume-to-Cap		rtio (X)		0.417	0.840		0.356	0.46		_		_	0.818	0.319	0.704	-
		t/In (95 th percentile	e)	102	232		53	114		78		_	257	40	260	242
		eh/ln (95 th percent		4.0	9.1		2.1	4.5		3.0		_	10.3	1.6	10.2	9.7
		RQ) (95 th percent	_	0.56	0.00		0.46	0.00	_	_	\rightarrow	\rightarrow	0.00	0.33	0.00	0.00
Uniform Delay (,	19.8	27.0		21.4	25.9				_	22.4	16.8	21.9	21.9
	niform Delay (d 1), s/ven cremental Delay (d 2), s/veh						0.3	0.3		_	_	_	0.6	0.2	2.6	2.8
	itial Queue Delay (d 3), s/veh						0.0	0.0	$\overline{}$	$\overline{}$	$\overline{}$	\rightarrow	0.0	0.0	0.0	0.0
Control Delay (**		20.1	0.0 28.9		21.7	26.3			\rightarrow	\rightarrow	23.1	17.1	24.5	24.7
Level of Service				C	C		C	C	C	В		\rightarrow	C	В	C	C
Approach Delay	• •			25.8		С	24.9		C	_	2.0	_	С	23.8		C
Intersection De							3.6							C		
Multimodal Re	ultimodal Results							WE	3		N	В			SB	
Pedestrian LOS	destrian LOS Score / LOS					В	2.28	3	В	2	.10		В	1.91	1	В
Diguelo LOC Co	ycle LOS Score / LOS					Α	1.10)	Α	1	.21		Α	1.22	2	Α

Table 84. Pennsylvania Ave and JFK Rd Tuesday 11AM-Noon HCS 10 Year Projected Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	ion R	esult	ts Sun	nmary	,				
General Inform	nation								Intersec	tion Inf	ormatio	on	1	43400	يا ي
Agency									Duration	h	1.000	1		4.1	.
Analyst				Analys	is Date	2/15/2	2024		Area Typ	е	Other	-	4		
Jurisdiction				Time F	Period				PHF		1.00				
Urban Street		John F Kennedy		Analys	is Year	2024			Analysis	Period	1> 12	:00	-		
Intersection		11am-12pm Penn/J	FK	File Na		-	DAY Int		ion (Pen		10YEA	Rproie		* + *	·
Project Descrip	tion												7	4141	21
							,								
Demand Inform	nation				EB	_		WE	3		NB			SB	
Approach Move	ement			L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), v	eh/h			181	208	120	93	169	9 107	131	669	77	89	637	162
Signal Informa	tion						:				5				
Cycle, s	72.4	Reference Phase	2		2		215		4	R	<u></u> ≒			_ >	→
Offset, s	0	Reference Point	End		1	1			B			1	2	3	4
Uncoordinated	Yes	Simult. Gap E/W	On	Green		0.9	23.1	6.0	2.2	13.8	3				
Force Mode				Yellow		0.0	4.0	4.0	0.0	4.0	`	Y	Ψ	Z	4
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2	_	6	0	7	3 8
Timer Results				EBI		EBT	WB		WBT	NB		NBT	SBI		SBT
Assigned Phase	Δ			3		8	7	-	4	1		6	5	_	2
Case Number				1.1	_	4.0	1.1	-	3.0	1.1		4.0	1.1	_	4.0
	nase Duration, s			13.3		21.1	11.2	-	19.0	12.0	-	29.1	11.1		28.2
	nange Period, (Y+R c), s			5.2	-	5.2	5.2	_	5.2	5.2	-	5.1	5.2	_	5.1
	ange Period, (Y+R c), s ax Allow Headway (MAH), s			3.1	_	3.2	3.1	_	3.2	3.1	_	3.1	3.1	_	3.1
Queue Clearan	- 7 (7.8	_	15.2	4.9	_	7.9	6.4	-	19.9	4.2	_	16.3
Green Extension		12 //		0.3	-	0.6	0.1	_	0.6	0.3	-	3.9	0.1		3.7
Phase Call Pro		(9-7,0		1.00	-	1.00	0.85	-	1.00	0.97	\rightarrow	1.00	0.83	3	1.00
Max Out Proba				0.00	-	0.00	0.00		0.61	0.00	-	0.00	0.00	_	0.10
Movement Gro		sults			EB		_	WB			NB	_		SB	
Approach Move				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move	ment			3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow I	Rate (v), veh/h		181	328		93	169	107	172	500	481	89	414	385
Adjusted Satura	ation Flo	ow Rate (ε), veh/h/l	n	1767	1741		1767	1856	_	1838	1856	1788	1838	1856	1725
Queue Service				5.8	13.2		2.9	5.9	4.3	4.4	17.9	17.9	2.2	14.2	14.3
-		e Time (gε), s		5.8	13.2		2.9	5.9	4.3	4.4	17.9	17.9	2.2	14.2	14.3
Green Ratio (g				0.30	0.22		0.27	0.19		0.41	0.33	0.33	0.40	0.32	0.32
Capacity (c), v				430	384		257	353	299	358	616	594	283	592	551
Volume-to-Cap	acity Ra	atio (X)		0.421	0.855		0.361	0.478		0.481	0.811	0.811	0.314	0.698	0.700
		t/ln (95 th percentile		103	234		53	115	71	77	274	260	40	248	230
		eh/In (95 th percenti	-	4.0	9.1	_	2.1	4.5	2.8	3.0	10.7	10.4	1.5	9.7	9.2
		RQ) (95 th percent	tile)	0.57	0.00	_	0.46	0.00	_	0.77	0.00	0.00	0.33	0.00	0.00
	niform Delay (d 1), s/veh			20.0	27.2		21.6	26.2	-	15.7	22.2	22.2	16.6	21.7	21.7
	cremental Delay (d 2), s/veh itial Queue Delay (d 3), s/veh			0.2	2.2		0.3	0.4	0.3	0.2	0.6	0.7	0.2	0.6	0.6
		**		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (20.2	29.4		21.9	26.6		15.9	22.8	22.9	16.9	22.3	22.3
	evel of Service (LOS) oproach Delay, s/veh / LOS			С	C		C	C	C	В	C	С	В	C	C
	tersection Delay, s/veh / LOS			26.2	<u>'</u>	С	25.2	2	С	21.8	5	С	21.7		С
Intersection De	lay, s/ve	eh / LOS				2:	3.0						С		
Multimodal Re	timodal Results				EB			WB			NB			SB	
	lestrian LOS Score / LOS				3 1	В	2.28	_	В	2.10		В	1.91		В
					3	A	1.10	_	A	1.2	\rightarrow	A	1.22	-	A
District Local	cle LOS Score / LOS					/ 1	1.10	-	/ 1	1.2		7.1	1.22		/ 1

Table 85. Pennsylvania Ave and JFK Rd Tuesday 4-5PM HCS 10 Year Projected Conditions

		HCS	Sigr	nalize	d Int	ersect	tion R	esul	ts Sun	nmary	,				
General Inform	nation								Intersec	tion Inf	ormatio	on		440.	يا ي
Agency									Duration	, h	1.000)		4.4	
Analyst				Analys	sis Dat	e 2/15/2	2024		Area Typ	е	Other	Г	4		_ :
Jurisdiction				Time F	Period				PHF		1.00				=
Urban Street		John F Kennedy		Analys	sis Yea	r 2024		\neg	Analysis	Period	1> 12	2:00			
Intersection		4-5pm Penn/JFK		File Na			BDAY Int	ersect	ion (Pen	n-JFK)_	10YEA	Rproje		5 1 5	
Project Descript	tion			,									7	4144	21
Demand Inform	nation				EB			W			NB			SB	
					_	T 5	+ .	_				T 5		_	
Approach Move				L 400	T	R	L	T		L 420	T 742	R	L	T	R
Demand (v), v	en/n		_	190	325	106	84	25	8 82	130	712	64	89	669	156
Signal Informa	tion				ΙŢ		213				5				
Cycle, s	76.6	Reference Phase	2	1		54		2 H	4	R	Ş	\ 4	P _	- ∕ ∣	Z
Offset, s	0	Reference Point	End	Grane	[]	12			33	18.9		1	2	3	4
Uncoordinated	Yes	Simult. Gap E/W	On	Green		0.0	4.0	5.8 4.0	_	4.0	<u> </u>		st.	_	
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2		1.2		5	Y	7	- ♀₃
Timer Results				EBI	L	EBT	WB	L	WBT	NBI	L	NBT	SBI	L	SBT
Assigned Phase	Э			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	<u> </u>			13.3	3	26.4	11.0		24.1	12.0		28.3	10.8	3	27.2
Change Period,	ange Period, (Y+R c), s			5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Head	dway (/	MAH), s		3.1	\neg	3.1	3.1	\neg	3.1	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	(a s), S		8.0		19.8	4.6		11.3	6.6		21.3	4.1		15.3
Green Extensio		12 //		0.3	-	1.4	0.1	\neg	1.5	0.3	-	1.9	0.1		0.0
Phase Call Prob				0.98	3	1.00	0.83	3	1.00	0.97	7	1.00	0.80		1.00
Max Out Probal	bility			0.00		0.01	0.00	0	0.00	0.00		0.16	0.00		1.00
Mayamant Cra	un Doo	ulto			EB			WB			NB			SB	
Movement Gro Approach Move		ouits		L	T	R	1	T	R	L	T	R	L	T	R
				3	8	18	7	4	14	1	6	16	5	2	12
Assigned Move		\ vah/h				10	-	-		_					
Adjusted Flow F		••	-	190	431	-	84	258		163	493	478	76	362	340
-		ow Rate (ε), veh/h/l	n	1767	1777	-	1767	1856	1212	1838	1856	1801	1838	1856	1734
Queue Service				6.0	17.8	-	2.6	9.3	3.2	4.6	19.3	19.3	2.1	13.2	13.3
Cycle Queue Cl		e Time (g c), s		6.0 0.35	17.8 0.28	-	0.32	9.3 0.25	0.25	4.6 0.38	19.3	19.3	0.36	13.2 0.29	13.3
Green Ratio (g.				422	492	+	247	458	-	345	564	547	244	535	500
Capacity (c), v		E- ()()					-			0.471				0.676	
Volume-to-Capa		· ·		0.451	0.875	-	0.340	0.563			0.875		0.310		0.680
		t/ln (95 th percentile		106	313		47	181		84	308	294	39	230	214
		eh/ln (95 th percenti		4.1	12.2	-	1.8	7.1	2.0	3.3	12.0	11.7	1.5	9.0	8.6
		RQ) (95 th percent	iie)	0.58	0.00	_	0.41	0.00		0.84	0.00	0.00	0.32	0.00	0.00
	niform Delay (d 1), s/veh			18.7	26.5 5.0		20.6	25.3 0.4	0.1	17.8 0.2	25.3 3.4	25.3 3.5	19.3	1.9	24.2
	cremental Delay (d 2), s/veh tial Queue Delay (d 3), s/veh			0.3	0.0		0.3	0.4	0.1	0.2	0.0	0.0	0.2	0.0	0.0
		**		18.9	31.5		20.0	25.7		18.0	28.7	28.8	19.5	26.1	26.3
Control Delay (-		20.9	-	_	-	-		-	_	-
Level of Service				B	C	-	C 24.	C		B	C	C	B 25.6	C	C
Approach Delay				27.6)	С	24.2	2	С	27.2	2	С	25.5)	С
Intersection Del	ay, S/Ve	en / LOS				2	6.4						С		
Multimodal Re	modal Results				EB			WB			NB			SB	
	estrian LOS Score / LOS				3	В	2.28	_	В	2.11		В	1.92		В
	cle LOS Score / LOS			1.51	-	В	1.19	-	Α	1.24	-	Α	1.24	$\overline{}$	Α

Table 86. Pennsylvania Ave and JFK Rd Tuesday 4-5PM HCS 10 Year Projected Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	ion R	esul	ts Sun	nmary	,				
General Inform	nation								Intersec	tion Inf	ormatio	on		440.	34 lg
Agency									Duration	, h	1.000)		4.1	
Analyst				Analys	sis Dat	e 2/15/2	2024		Area Typ	e	Other	г	4		
Jurisdiction				Time F	Period				PHF		1.00		84		
Urban Street		John F Kennedy		Analys	sis Yea	r 2024			Analysis	Period	1> 12	2:00	7		-
Intersection		4-5pm Penn/JFK		File N		-	DAY Int	ersec	tion (Pen				-		
Project Descrip	tion	- Spinit Similar II		1		1.02.							-	4141	t+ (*)
,															
Demand Inform	mation				EB			W	В		NB			SB	
Approach Move	ement			L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), v	/eh/h			190	325	106	84	25	8 82	130	712	64	89	669	156
Signal Informa	_	1	_		7		121/2	La		3	₩.			,	→
Cycle, s	80.8	Reference Phase	2		5	151	al 51	2	R	H3	6] 1	2	-/ 3	
Offset, s	19	Reference Point	End	Green	5.8	1.2	24.6	6.0		19.9					
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	4.0	0.0	4.0		\	\$ P		
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		6	0	7	<u> </u>
Timer Results				EBI	L	EBT	WB	L	WBT	NB	L	NBT	SBI	-	SBT
Assigned Phas	е			1,1	_	8	7	-	4	1	_	6	5	_	2
Case Number	ase Number hase Duration, s				_	4.0	1.1	-	3.0	1.1	_	4.0	1.1		4.0
					3	27.7	11.2	_	25.1	12.2	_	30.9	11.0	<u> </u>	29.7
	ange Period, (Y+Rc), s			5.2	_	5.2	5.2	-	5.2	5.2	-	5.1	5.2	_	5.1
Max Allow Hea				3.1	-	3.1	3.1	_	3.1	3.1	-	3.1	3.1	\rightarrow	3.1
Queue Clearan				8.3	_	20.8	4.8	-	11.9	6.8	-	22.0	4.2	_	15.8
Green Extension		(ge), S		0.3	_	1.5	0.1	_	1.5	0.3	-	3.5	0.1		3.6
Phase Call Pro	bability			0.99	9	1.00	0.85	5	1.00	0.97	7	1.00	0.82	2	1.00
Max Out Proba	bility			0.00		0.00	0.00		0.00	0.00		0.01	0.00		0.00
Movement Gro	nun Res	sults			EB			WB			NB			SB	
Approach Move		Juito		L	T	R	1	T	R	L	T	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow		() vob/b		190	431	10	84	258		163	493	478	76	362	340
		**			1777	-	1767	1856		1838	1856	1801	1838	1856	1734
•		ow Rate (ε), veh/h/l	П	1767	18.8	-	2.8	9.9	3.4	4.8	20.0	20.0	2.2	13.7	13.8
Queue Service				6.3				9.9	3.4		20.0	20.0	2.2	13.7	13.8
		ce Time (g c), s		6.3 0.36	18.8 0.28		0.32	0.25		0.39	0.32	0.32	0.38	0.30	0.30
Green Ratio (g				419	497		244	457	_	353	595	577	250	567	529
Capacity (c), v		atio (V)						121							
Volume-to-Cap			`	0.454	0.866		0.345			0.461	0.829		0.303	0.639	0.642
		t/ln (95 th percentile	,	114	316		50	195	_	88	311	296	40	232	215
		eh/ln (95 th percenti	-	4.4	12.3		2.0	7.6	2.2	3.4	12.1	11.8	1.6	9.1	8.6
		RQ) (95 th percent	iie)	0.63 19.7	0.00		0.44	0.00	21.12	0.88	0.00	0.00	0.34	0.00	0.00
	niform Delay (d 1), s/veh				27.9		21.9	26.8	_	18.0	25.6	25.6	19.5	24.4	24.4
	cremental Delay (d 2), s/veh tial Queue Delay (d 3), s/veh				1.9		0.3	0.4	0.1	0.2	0.7	0.0	0.2	0.3	0.4
				0.0	0.0		0.0								0.0
Control Delay (20.0	29.7		22.2	27.2	-	18.2	26.3	26.4	19.7	24.7	24.8
Level of Service	<u> </u>			C 26.8	C		C	C		B 25.0	C	C	B	C	C
	proach Delay, s/veh / LOS ersection Delay, s/veh / LOS				5	С	25.7		С	25.2	2	С	24.3	5	С
intersection De	iay, s/ve	en / LOS				2	5.3						С		
Multimodal Re	sults				EB			WB			NB			SB	
	destrian LOS Score / LOS				3	В	2.28	_	В	2.11		В	1.92		В
					1	В	1.19	_	A	1.24	$\overline{}$	A	1.32	\rightarrow	A
Dicycle LOG St	tle LOS Score / LOS					U	1.18	_	n	1.24	•	А	1.24		

Table 87. Pennsylvania Ave and JFK Rd Tuesday 5-6PM HCS 10 Year Projected Conditions

		HCS	Sigr	nalize	d Inte	ersect	ion R	esul	ts Sun	nmary	,				
General Inform	nation								Intersec	tion Inf	ormatio	on		dle:	34 L
Agency									Duration	, h	1.000			7.,	
Analyst				Analys	sis Dat	e 2/15/2	2024		Area Typ	е	Other	•	-A-		_
Jurisdiction				Time F	eriod				PHF		1.00				
Urban Street		John F Kennedy		Analys	sis Yea	r 2024			Analysis	Period	1> 12	:00	-		
Intersection		5-6pm Penn/JFK		File Na	ame	TUES	DAY Int	ersect	ion (Pen	n-JFK)_	10YEA	Rproje		5 1 3	
Project Descrip	tion												n	4147	21
Demand Inforr	nation				EB			W	2		NB			SB	
Approach Move				L	Τ	R	1	ΤŢ		1	T	□ R	L	T	R
Demand (v), v				199	351	_	_	27	_	147	840	_	114	717	192
Demand (V), V	CII/II			199	331	123	109	21	0 93	147	040	00	114	717	192
Signal Informa	ition				7	\top	215	3	2	2	<u> </u>	را			→
Cycle, s	80.3	Reference Phase	2		7	150	2 M	2Ľ	Æ	ĸ	E"	۲. ۲		-	7
Offset, s	0	Reference Point	End	Green	6.0	0.8	22.5	6.4	2.2	21.9	9 1		2	0	
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	4.0		4.0	_ \		SÎZ		7
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2		1.2		- 6	To	7	<u> </u>
T. D. W						EDT			LUDT			N.D.T.	0.01		0.07
Timer Results	_			EBI	-	EBT	WB	L	WBT	NB	L	NBT	SBI	-	SBT
Assigned Phase	ase Number			1.1	_	8	7	_	4	1	_	6	5	\rightarrow	2
					-	4.0	1.1	-	3.0	1.1	-	4.0	1.1	_	4.0
	nase Duration, s hange Period, (Y+R c), s			13.7	-	29.3	11.6	-	27.1	11.9	-	28.3	11.2	-	27.6
				5.2	-	5.2	5.2	-	5.2	5.2	-	5.1	5.2	_	5.1
Max Allow Head				3.1	-	3.1	3.1	_	3.1	3.1	-	3.1	3.1	-	3.1
Queue Clearan				8.3	-	22.6	5.4	\rightarrow	12.2	6.5	-	21.4	4.5		15.5
Green Extensio	n Time	(ge), S		0.3		1.4	0.1	\rightarrow	1.7	0.3	-	1.7	0.1	\perp	0.0
Phase Call Pro	bability			0.99		1.00	0.9	1	1.00	0.96	ĵ	1.00	0.85	5	1.00
Max Out Proba	bility			0.00		0.05	0.0)	0.00	0.00)	0.15	0.00		1.00
Movement Gro	oup Res	sults			EB			WB			NB			SB	
Approach Move	ement			L	Т	R	L	T	R	L	T	R	L	Т	R
Assigned Move	ment			3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow F), veh/h		199	474		109	276	95	147	471	455	85	349	326
		ow Rate (s), veh/h/l	n	1767	1773		1767	1856	1572	1838	1856	1795	1838	1856	1720
Queue Service				6.3	20.6		3.4	10.2		4.5	19.4	19.4	2.5	13.4	13.5
Cycle Queue C				6.3	20.6		3.4	10.2		4.5	19.4	19.4	2.5	13.4	13.5
Green Ratio (g				0.38	0.30		0.35	0.27	0.27	0.36	0.29	0.29	0.35	0.28	0.28
Capacity (c), v				438	531		248	506	429	332	537	520	240	519	481
Volume-to-Capa		atio (X)		0.455	0.892		0.440	0.545		0.443	0.876	0.876	0.352	0.672	0.677
		t/In (95 th percentile)	113	374		62	198	_	83	355	339	47	235	218
		eh/ln (95 th percenti		4.4	14.6		2.4	7.7	2.4	3.2	13.9	13.5	1.8	9.2	8.7
		RQ) (95 th percent	_	0.62	0.00		0.54	0.00		0.83	0.00	0.00	0.39	0.00	0.00
			-,	18.3	26.9		20.9	25.0		19.1	27.2	27.2	20.6	25.7	25.8
	niform Delay (d 1), s/veh cremental Delay (d 2), s/veh				9.6		0.5	0.3	0.1	0.3	6.1	6.3	0.2	1.9	2.2
	itial Queue Delay (d s), s/veh				0.0		0.0	0.0	_	0.0	0.0	0.0	0.0	0.0	0.0
	ontrol Delay (d), s/veh				36.5		21.3	25.3		19.5	33.3	33.5	20.8	27.7	27.9
	evel of Service (LOS)				D		С	C	C	В	C	C	С	C	С
	pproach Delay, s/veh / LOS				2	С	23.9		С	31.5		С	27.0		С
	tersection Delay, s/veh / LOS						9.1		-				C		
Multimodal Re	Iltimodal Results							WB			NB			SB	
Pedestrian LOS	destrian LOS Score / LOS					В	2.2	3	В	2.1	1	В	1.92	2	В
Bicycle LOS Sc	/cle LOS Score / LOS					В	1.28	8	Α	1.37	7	Α	1.33	3	Α

Table 88. Pennsylvania Ave and JFK Rd Tuesday 5-6PM HCS 10 Year Projected Conditions Optimized

		HCS	Sigr	nalize	d Int	ersec	tion R	esul	ts Sun	nmary	,				
General Inform	nation								Intersec	tion Inf	ormatio	on	1	420.	يا ي
Agency									Duration	, h	1.000)		4.1	
Analyst				Analys	sis Dat	e 2/15/	2024		Area Typ	e	Other		4		
Jurisdiction				Time I	Period				PHF		1.00				
Urban Street		John F Kennedy				r 2024			Analysis	Period	1> 12	-00			
Intersection		5-6pm Penn/JFK		File N			SDAY Int		ion (Pen				-		
Project Descrip	tion	o opini i onnioi it		111011	uiiio	11020	, D, (1 1111	.010001	1011 (1 011	1 01 10,_	101270	гергојо	-	414**	2 (
1 Toject Descrip	tion														
Demand Inform	nation				EB		$\overline{}$	WE	3	$\overline{}$	NB		$\overline{}$	SB	
Approach Move				1	T	R	L	T	_	L	T	R	T.	T	R
Demand (v), v				199	351					147	840	_	114	717	192
Bemana (v), v	CHINI		-	100	551	123	100	21	0 00	141	040	- 00	114	7.17	102
Signal Informa	ition									$\overline{}$	8				_
Cycle, s	84.3	Reference Phase	2	1	"			_ [~	4	R	₽	∖ 4	<u> </u>	⋰ │	₹
Offset, s	106	Reference Point	End	<u> </u>	1							1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Green		0.7	25.1	6.5	0.5	24.7	<u> </u>		-4-	_	_
Force Mode	Fixed	Simult. Gap N/S	On	Yellow Red	1.2	0.0	4.0 1.1	4.0 1.2		1.2		1	Y		↔
TOTAL WILLIAM	TIXEU	Official Cap 1975	Oll	INCU	11.4	0.0	1.1	1.2	10.0	1.2					
Timer Results				EBI		EBT	WB		WBT	NBI		NBT	SBI		SBT
				3	-	8	7	_	4	1	-	6	5	-	2
Assigned Phas	se Number				_		_			_	_	4.0	_	_	4.0
	ase Number ase Duration, s				+	4.0	1.1	-	3.0	1.1	\leftarrow		1.1	-	
					2	30.4	11.7	_	29.9	12.0	_	30.9	11.3	_	30.2
	ange Period, (Y+R ε), s					5.2	5.2	_	5.2	5.2	_	5.1	5.2	-	5.1
Max Allow Hea				3.1	-	3.1	3.1	_	3.1	3.1	-	3.1	3.1	-	3.1
Queue Clearan				8.7		23.8	5.5	_	12.5	6.6	-	22.0	4.6	-	15.9
Green Extension	n Time	(ge), S		0.0		1.0	0.2		1.4	0.3		3.4	0.2		3.4
Phase Call Pro	bability			0.99	9	1.00	0.92	2	1.00	0.97	7	1.00	0.86	6	1.00
Max Out Proba	bility			1.00		0.00	0.00)	0.08	0.00		0.00	0.00	<u> </u>	0.00
								14/15			NID.			0.0	
Movement Gro		suits			EB			WB	T 5		NB		.	SB	
Approach Move				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow				199	474		109	276	95	147	471	455	85	349	326
		ow Rate (ε), veh/h/l	n	1767	1773	-	1767	1856	-	1838	1856	1795	1838	1856	1720
Queue Service				6.7	21.8		3.5	10.5		4.6	20.0	20.0	2.6	13.8	13.9
		e Time (gε), s		6.7	21.8	-	3.5	10.5		4.6	20.0	20.0	2.6	13.8	13.9
Green Ratio (g	/C)			0.38	0.30		0.37	0.29	_	0.38	0.31	0.31	0.37	0.30	0.30
Capacity (c), v	/eh/h			425	532		241	547	463	342	572	553	249	555	514
Volume-to-Cap	acity Ra	atio (X)		0.469	0.891	1	0.451	0.505	0.205	0.430	0.823	0.824	0.340	0.629	0.633
Back of Queue	(Q), f	t/ln (95 th percentile)	122	358		64	202	64	86	342	325	49	236	218
Back of Queue	(Q), v	eh/In (95 th percenti	le)	4.8	14.0		2.5	7.9	2.5	3.4	13.4	13.0	1.9	9.2	8.7
Queue Storage	Ratio (RQ) (95 th percent	ile)	0.67	0.00		0.56	0.00	0.55	0.86	0.00	0.00	0.41	0.00	0.00
Uniform Delay				19.3	28.5	-	21.4	24.9	-	19.2	27.3	27.3	20.7	25.8	25.8
	cremental Delay (d 2), s/veh						0.5	0.3	0.1	0.3	1.2	1.2	0.2	0.3	0.4
	tial Queue Delay (d 3), s/veh						0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ontrol Delay (d), s/veh						21.9	25.2	-	19.5	28.5	28.5	20.9	26.1	26.2
Level of Service				19.6 B	30.7 C		C	C	C	В	C	C	C	C	C
				27.4		С	23.9	_	C	27.3		С	25.6		С
	proach Delay, s/veh / LOS ersection Delay, s/veh / LOS						6.3		-	21.0			C 25.0		
miersection De	idy, 5/Vt	an / LOO					v.J								
Multimodal Re	timodal Results							WB			NB			SB	
	lestrian LOS Score / LOS					В	2.2	_	В	2.11	_	В	1.92	_	В
	estrian LOS Score / LOS /cle LOS Score / LOS				3	В	1.28	-	A	1.37	$\overline{}$	A	1.33	-	A
Disylete EUO OL	OIL L			1.60			1.20	-	/ 1	1.3/		7.1	1.00		

Table 89. Wacker Dr and JFK Rd Tuesday 11AM-Noon HCS 10 Year Projected Conditions

		HUS	5 Sigr	ialize	a inte	rsecti	on R	esu	lts Sun	ımary					
Canaral Inform	ation.								Interses	tion Inf				41.0	KII.
General Inform	lation								Intersec				- ú	1.1	
Agency				A = -1-	in D-1	2/20/2	024		Duration		1.000		2		
Analyst						2/20/2	024		Area Typ	е	Other				
Jurisdiction				Time F					PHF		1.00		4	7.	7
Urban Street		Wacker/JFK			is Year	-			Analysis		1> 7:0		_		
Intersection		Wacker/JFK 11AM-		File Na	ame	TUES	DAY Int	ersec	tion (Wac	ker-JFK)_10YE	ARpr		* † *	
Project Descrip	tion	Wacker/JFK TUESI	DAY	_	_	_	_			_	_	_		414**	21
Demand Inforr	nation				EB			W	'B		NB			SB	
Approach Move					Т	R	T.	T	R	L	T	R		Т	T R
Demand (v), v				286	6	49	6	1		75	494	6	14	426	23
Signal Informa		-			7		245		\equiv		Į		-4-		_
Cycle, s	50.2	Reference Phase	2		5	517	* SAY	ŗ₿	6			1	Y	3	↔
Offset, s	0	Reference Point	End	Green	0.7	3.8	15.0	8.0	1.2	0.0					<u>-</u>
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	3.0		0.0		\ 4	<u> </u>	⋰	7
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.:	5 2.5	0.0		5	0	7	
Timor Doculto				EDI		EDT	MP		WBT	MDI		NDT	CDI		ерт
Assigned Phase				EBI	-	EBT 4	WBI	-	8 8	NBI 5	-	NBT 2	SBI 1	-	SBT 6
Case Number	E					10.0		-	12.0	1.1		4.0	1.1		4.0
	hase Duration, s					13.5		\rightarrow	6.7	9.5	-	24.3	5.7	-	20.5
	hange Period. (Y+R c), s					5.5		_	5.5	5.0	-	5.5	5.0	-	5.5
Max Allow Hea		**				3.2		_	3.2	3.1		3.1	3.1	-	3.1
Queue Clearan						7.4		\neg	2.2	4.9		14.2	2.2		8.2
Green Extension					\neg	0.7		\neg	0.0	0.2	\neg	3.4	0.0		3.4
Phase Call Pro	bability					0.99			0.20	0.89		1.00	0.14	1	1.00
Max Out Proba	bility					0.00			0.00	0.00		0.00	0.00		0.00
Massamant Con	D				- FD			10/1	,		NID			00	
Movement Gro		suits		L	EB T	R	L	WE	R	L	NB T	R	L	SB T	R
Approach Move					_			T						<u> </u>	_
Assigned Move		\		7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow I				143	198	-	8		8	159	531	529	11	278	251
•		ow Rate (s), veh/h/l	П	1810	1762		1831		1610	1810	1900	1892	1810	1900	167
Queue Service				3.6	5.4 5.4		0.2		0.2	2.9	12.2	12.2	0.2	6.0	6.2
Cycle Queue C		e nine (gr), s		3.6			0.2			2.9		0.37	0.2	0.30	0.3
Green Ratio (g				0.16 288	0.16 280		44		0.02 39	0.41 463	0.37 712	709	219	568	500
Capacity (c), v Volume-to-Capa		tio (Y)		0.497	0.707		0.181		0.206	0.344	0.746	0.746	0.051	0.489	0.50
)	62	91		4		4	41	165	164	3	99	90
Rack of Output		eh/in (95 th percenti		2.5	3.6		0.2		0.2	1.6	6.6	6.6	0.1	4.0	3.6
Back of Queue Back of Queue		RQ) (95 th percent		0.12	0.18		0.09		0.09	0.21	0.33	0.33	0.05	0.20	0.1
Back of Queue			-,	19.3	20.0		24.0		24.1	10.3	13.6	13.6	13.0	14.5	14.
Back of Queue		/ven		0.5	1.2		0.7		1.0	0.1	0.3	0.3	0.0	0.2	0.2
Back of Queue Queue Storage Uniform Delay ((d 1), s			0.5			0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Back of Queue Queue Storage	(d1),s lay(d2), s/veh		0.0	0.0					-					_
Back of Queue Queue Storage Uniform Delay Incremental De	(d1),s lay(d2 elay(d), s/veh s), s/veh			0.0 21.3		24.8		25.0	10.4	13.9	13.9	13.1	14.7	14.8
Back of Queue Queue Storage Uniform Delay (Incremental De Initial Queue De Control Delay ((d1), s lay (d2 elay (d d), s/v), s/veh 3), s/veh eh		0.0			-		25.0 C	10.4 B	13.9 B	13.9 B	13.1 B	14.7 B	-
Back of Queue Queue Storage Uniform Delay (Incremental De Initial Queue De	(d1), s lay (d2 elay (d d), s/v e (LOS)), s/veh s), s/veh eh		0.0 19.8	21.3 C	С	24.8				В		_	В	-
Back of Queue Queue Storage Uniform Delay (Incremental De Initial Queue Do Control Delay (Level of Service	(d1), s lay (d2 elay (d d), s/ve e (LOS) y, s/veh), s/veh s), s/veh eh		0.0 19.8 B	21.3 C	C 15	24.8 C 24.9		С	В	В	В	В	В	14.8 B
Back of Queue Queue Storage Uniform Delay Incremental De Initial Queue De Control Delay Level of Service Approach Delay Intersection De	(d1), s lay (d2 elay (d d), s/ve e (LOS) y, s/veh lay, s/ve), s/veh s), s/veh eh		0.0 19.8 B	21.3 C		24.8 C 24.9		C	В	В	В	B 14.7	В 7	В
Back of Queue Queue Storage Uniform Delay (Incremental De Initial Queue Do Control Delay (Level of Service Approach Delay	(dr), s lay (dz elay (d d), s/v e (LOS) e (LOS) sy, s/veh lay, s/ve), s/veh s), s/veh eh / LOS		0.0 19.8 B	21.3 C		24.8 C 24.9	WE	C	В	B NB	В	B 14.7	B 7 SB	В

Table 90. Wacker Dr and JFK Rd Tuesday 11AM-Noon HCS 10 Year Projected Conditions Optimized

		HCS	Sigr	ialize	a inte	rsect	ion R	esu	lts Sun	nmary					
General Inform	ation								Intersec	tion Inf	ormatio	nn.	T k	43.00	ьU
	lation								Duration		1.000		- 0	4.1	
Agency				Analys	sic Dota	2/20/2	024		_		Other		2		
Analyst				_		2/20/2	024		Area Typ	Эе	_				
Jurisdiction				Time F					PHF		1.00		4		7
Urban Street		Wacker/JFK			sis Year				Analysis		1> 7:0		- 5		
Intersection		Wacker/JFK 11AM-		File Na	ame	TUES	DAY Int	ersec	ction (Wad	ker-JFK)_10YE	ARpr		* 13	
Project Descrip	tion	Wacker/JFK TUESI	DAY	_	_	_	_			_	_	_	1	414	21
Demand Inform	nation				EB			V	/B		NB			SB	
Approach Move	ment			L	Т	R	L	Т-	T R	1	T	R	L	Т	R
Demand (v), v				286	6	49	6	_	2 8	75	494	6	14	426	23
Signal Informa	49.8	Reference Phase	2		1 6		215	L	Ħ		Į		stz		7
Cycle, s	49.0	Reference Point			15	1 517	1 :11	"F				1	2	3	Z
Offset, s Uncoordinated			End	Green		3.7	15.0	7.		0.0					Δ
	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	3.		0.0	_	\	<u> </u>		Z
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.	5 2.5	0.0		6	0	7	
Timer Results				EBI		EBT	WBI		WBT	NBI		NBT	SBI		SBT
Assigned Phase	9					4			8	5		2	1		6
Case Number						10.0			12.0	1.1		4.0	1.1		4.0
Phase Duration	nase Duration, s				\neg	13.1		\neg	6.7	9.5		24.2	5.7		20.5
Change Period,	hange Period, (Y+R c), s					5.5			5.5	5.0		5.5	5.0		5.5
Max Allow Head					$\overline{}$	3.2		\neg	3.2	3.1		3.1	3.1	\neg	3.1
Queue Clearan						7.3		\rightarrow	2.2	4.8		13.9	2.2	_	8.1
Green Extensio						0.3		_	0.0	0.1		3.4	0.0	_	3.4
Phase Call Prof		(9-7,-				0.99		_	0.20	0.89	,	1.00	0.14	-	1.00
Max Out Probal					_	0.74		7	0.00	0.94	_	0.00	0.00	_	0.00
Manager 4 Con	D.							147			NID			0.0	
Movement Gro		suits			EB			WI	_		NB			SB	
Approach Move				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow F				143	198		8		8	158	527	525	11	278	25
		w Rate (s), veh/h/l	n	1810	1762		1831		1610	1810	1900	1892	1810	1900	167
Queue Service				3.6	5.3		0.2		0.2	2.8	11.9	11.9	0.2	6.0	6.1
Cycle Queue C	learanc	e Time (gε), s		3.6	5.3		0.2		0.2	2.8	11.9	11.9	0.2	6.0	6.1
Green Ratio (g	/C)			0.15	0.15		0.02		0.02	0.41	0.38	0.38	0.32	0.30	0.3
Capacity (c), v	eh/h			277	269		45		39	466	716	713	223	573	50
Volume-to-Capa	acity Ra	tio (X)		0.517	0.735		0.180		0.204	0.338	0.736	0.736	0.050	0.485	0.49
		t/In (95 th percentile		62	93		4		4	40	160	160	3	98	89
		eh/In (95 th percenti		2.5	3.7		0.2		0.2	1.6	6.4	6.4	0.1	3.9	3.5
Queue Storage	Ratio (RQ) (95 th percent	tile)	0.12	0.19		0.09		0.09	0.20	0.32	0.32	0.05	0.20	0.1
Uniform Delay (d 1), S	/veh		19.4	20.1		23.8		23.8	10.2	13.4	13.4	12.8	14.2	14.
Incremental De	lay (d 2), s/veh		0.6	1.8		0.7		0.9	0.1	0.3	0.3	0.0	0.2	0.2
Initial Queue De	elay (d	з), s/veh		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/v	eh		20.0	21.9		24.5		24.8	10.3	13.7	13.7	12.8	14.4	14.
Level of Service	(LOS)			В	С		С		С	В	В	В	В	В	В
Approach Delay	, s/veh	/LOS		21.1	1	С	24.7		С	13.2	2	В	14.4	4	В
Intersection Del	ay, s/ve	h / LOS				14	.9						В		
Multimodal Da	eulte				EB			10/			ND			CD.	
multimodal Re	Iltimodal Results					В	2.29	WI	<u>В</u>	1.89	NB	В	2.09	SB	В
Dadaskins 1 00	destrian LOS Score / LOS cycle LOS Score / LOS								₩.						-

Table 91. Wacker Dr and JFK Rd Tuesday 4-5PM HCS 10 Year Projected Conditions

		HCS	Sigr	nalize	d Inte	ersect	ion R	esu	Its Sun	nmary	,				
General Inform	nation								Intersec	tion Inf	ormatio	on	1	420.	34 lg
Agency									Duration	, h	1.000			4.1	.
Analyst				Analys	is Date	2/20/2	2024		Area Typ	e	Other		4		
Jurisdiction				Time F	eriod				PHF		1.00		# # F		÷
Urban Street		Wacker/JFK		Analys	is Year	2024			Analysis	Period	1> 7:0	00	4		
Intersection		Wacker/JFK 4-5PM		File Na			DAY Int	erse	ction (Wad) 10YE	ARpr	-	K + 4	·
Project Descrip	tion	Wacker/JFK TUESI									/		- 4	4144	21
T Tojout Dubbinp		THURSDAY IN TOLOR	,,,,												
Demand Inform	nation				EB		$\overline{}$	٧	/B	\top	NB			SB	
Approach Move				L	Т	R	1	Τ.	T R	L	T	R	1	Т	R
Demand (v), v				383	2	70	6	-	0 7	105	647	6	22	507	235
202							_							-	
Signal Informa	ition				I.		215	т	5_	\top					
Cycle, s	52.5	Reference Phase	2	1	°	5.4		"E	: 27		•	<u> </u>	V		
Offset, s	0	Reference Point	End		()	<u></u>	- 11					1	2	3	Y 4
Uncoordinated	Yes	Simult. Gap E/W	On	Green		0.0	15.0	3.	0.3 1.7	0.0				,	
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.		0.0) [-1		-	
T Gree mode	Tixed	Olindic Oup 1410	OII	Ittou	1.0	0.0	1.0	1	0 2.0	0.0	_				
Timer Results				EBI	$\overline{}$	EBT	WB		WBT	NB		NBT	SBI		SBT
Assigned Phas					-	4	- WD	-	8	5		2	1		6
	ase Number			_	_	10.0	\vdash	-	12.0	1.1	_	4.0	1.1	_	4.0
	nase Duration, s			_	-		-	\rightarrow		8.9	-		5.6	-	20.5
	nase Duration, s nange Period, (Y+R c), s			_	-	15.8	_	-	7.2		_	23.8		_	
		**		_	-	5.5	├	\rightarrow	5.5	5.0	-	5.5	5.0	_	5.5
Max Allow Hea					+	3.3		-	3.2	3.1	-	3.1	3.1	-	3.1
Queue Clearan					_	9.4		_	2.3	4.1	-	9.1	2.2	-	5.6
Green Extension		(ge), S			\perp	0.9		_	0.0	0.1	\rightarrow	1.8	0.0	-	1.8
Phase Call Pro	bability					1.00		_	0.28	0.78	3	1.00	0.13	3	1.00
Max Out Proba	bility					0.00		_	0.00	0.00		0.00	0.00		0.00
Movement Gro	oup Res	sults			EB			W	В		NB			SB	
Approach Move				L	Т	R	L	Т	_	L	Т	R	L	Т	R
Assigned Move				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow I		r) veh/h		192	264		12	Ť	11	105	327	326	9	160	151
		ow Rate (s), veh/h/l	n	1810	1757		1854		1704	1810	1900	1894	1810	1900	1700
Queue Service				5.0	7.4		0.3		0.3	2.1	7.1	7.1	0.2	3.4	3.6
		gs), s e Time (gε), s		5.0	7.4		0.3		0.3	2.1	7.1	7.1	0.2	3.4	3.6
Green Ratio (e Tille (gt), s		0.20	0.20		0.03		0.03	0.37	0.35	0.35	0.30	0.29	0.29
					347		61	-	56	507	662	660	297	543	486
Capacity (c), v		-E- ()()		357											
Volume-to-Cap				0.536	0.760		0.199	_	0.196	0.207	0.494	0.494	0.031	0.295	0.310
		t/ln (95 th percentile		85	126		6		6	31	116	116	3	58	55
		eh/ln (95 th percenti		3.4	5.0		0.3		0.2	1.2	4.6	4.6	0.1	2.3	2.2
		RQ) (95 th percent	ile)	0.17	0.25		0.14		0.13	0.16	0.23	0.23	0.05	0.12	0.11
Uniform Delay				18.9 0.5	19.9		24.7		24.7	11.4	13.5	13.5	13.3	14.6	14.7
	cremental Delay (d 2), s/veh				1.3		0.6		0.6	0.1	0.2	0.2	0.0	0.1	0.1
	tial Queue Delay (d s), s/veh				0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (ntrol Delay (d), s/veh				21.2		25.3		25.4	11.4	13.7	13.7	13.4	14.7	14.8
Level of Service	vel of Service (LOS)				С		С		С	В	В	В	В	В	В
Approach Dela	proach Delay, s/veh / LOS			20.4		С	25.3	3	С	13.4	1	В	14.7	7	В
Intersection De	ersection Delay, s/veh / LOS					15	5.9						В		
Multimodal Da	timodal Results				EB			W	D		NB			SB	
	timodal Results					D	2.20	_		4.04		D	2.00		D
	estrian LOS Score / LOS					В	2.29	\rightarrow	В	1.89	\rightarrow	В	2.09	\rightarrow	В
BICYCIE LOS SO	cle LOS Score / LOS					Α	0.51		Α	1.11		Α	1.12	2	Α

JCTP Consulting 150

Table 92. Wacker Dr and JFK Rd Tuesday 4-5PM HCS 10 Year Projected Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	ion R	esu	ılts Su	nmary	/				
General Inform	nation								Interse	ction Inf	ormatio	on		440.	je liji
Agency									Duratio	n, h	1.000	1		4.1	
Analyst				Analys	sis Date	2/20/2	2024		Area Ty	ре	Other		4		
Jurisdiction				Time F	eriod				PHF		1.00		# T		÷
Urban Street		Wacker/JFK		Analys	sis Year	2024			Analysi	Period	1> 7:	00	7		
Intersection		Wacker/JFK 4-5PM		File N			DAY Int	erse	ction (Wa				-	K + 4	
Project Descrip	tion	Wacker/JFK TUESI		1									- 4	4144	21
		THUSING THE TOTAL													
Demand Inform	mation				EB		$\overline{}$	٧	VB	\neg	NB		Т	SB	
Approach Move	ement			L	Т	R		т	T R	1	T	R	L	Т	R
Demand (v), v				383	2	70	6	1	10 7	105	647	6	22	507	235
							_	ė							
Signal Informa	ation				T.		215	Т	<u></u>	\neg					
Cycle, s	51.1	Reference Phase	2	1	150	15/4		r#	3 7		•	Y	V		4
Offset, s	0	Reference Point	End	1	()	122						1	2	3	Y 4
Uncoordinated		Simult. Gap E/W	On	Green	-	0.0	4.0	9.		0.0				,	→
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2				6	0	7	
										,					
Timer Results				EBI		EBT	l wa		WBT	NB		NBT	SBI		SBT
Assigned Phas	e					4	11.0	_	8	5		2	1		6
	ase Number			_	_	10.0			12.0	1.1		4.0	1.1	_	4.0
	nase Duration, s			_	_	15.4		-	7.2	8.9	-	22.9	5.6	_	19.6
	nase Duration, s nange Period, (Y+R c), s			-	_	5.5	-	-	5.5	5.0	_	5.5	5.0	_	5.5
				-	-		-	-			_			_	
Max Allow Hea				⊢	_	3.3	_	_	3.2	3.1	-	3.1	3.1	-	3.1
Queue Clearan		12 //		_	_	9.3	-	_	2.3	4.0	-	9.0	2.2	-	5.6
Green Extension		(g e), S		<u> </u>	_	0.7	_	_	0.0	0.2	-	1.4	0.0	-	0.9
Phase Call Pro					_	1.00	_	_	0.28	0.7		1.00	0.12		1.00
Max Out Proba	bility				_	0.07		_	0.00	0.0	0	0.16	0.00		0.00
Movement Gro	oup Res	sults			EB			W	В		NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow) veh/h		192	264		12		11	105	327	326	9	160	151
		ow Rate (ε), veh/h/l	n	1810	1757		1854		1704		1900	1894	1810	1900	1700
Queue Service				4.9	7.3		0.3		0.3	2.0	7.0	7.0	0.2	3.4	3.6
		e Time (qc), s		4.9	7.3		0.3		0.3	2.0	7.0	7.0	0.2	3.4	3.6
Green Ratio ((g t), u		0.19	0.19		0.03		0.03		0.34	0.34	0.29	0.28	0.28
Capacity (c), v				352	342		61		56	501	646	644	292	525	470
		atio (V)		0.544	0.771		0.197		0.195		0.506	0.506	0.032	0.305	0.321
Volume-to-Cap			١		123										
		t/In (95 th percentile		3.3	4.9		0.3		0.2	1.2	113 4.5	113 4.5	0.1	2.3	2.2
		eh/ln (95 th percenti		-											
		RQ) (95 th percent	iie)	0.17	0.25		0.14		0.13	0.16	0.23	0.23	0.05	0.11	0.11
Uniform Delay				18.6 0.5	19.5		24.1		24.1	11.4	13.5	13.5	13.4	14.6	14.7
Incremental De	cremental Delay (d 2), s/veh				1.4		0.6		0.6	0.1	0.3	0.3	0.0	0.1	0.1
	tial Queue Delay (d s), s/veh			0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (19.0	20.9		24.7		24.7	11.5	13.7	13.7	13.4	14.8	14.8
Level of Service				В	С		С	L,	С	В	В	В	В	В	В
Approach Dela				20.1		С	24.7	7	С	13.4	4	В	14.8	3	В
Intersection De	ersection Delay, s/veh / LOS					1	5.8						В		
Multim - d-1.5	Itimodal Results							14.	n .		NIB			0.0	
	Itimodal Results				EB		2.5	W		1	NB		2.00	SB	
	estrian LOS Score / LOS				3	В	2.29	\rightarrow	В	1.8	-	В	2.09	\rightarrow	В
Bicycle LOS So	cle LOS Score / LOS				1	Α	0.51		Α	1.1	1	Α	1.12	2	Α

Table 93. Wacker Dr and JFK Rd Tuesday 5-6PM HCS 10 Year Projected Conditions

			, o.g.	IUIIZO	u IIII	13661	ion R	csu	mts .	Juli	illiai y					
Comment	4:								Links		: I 6	4.			dle.	e in
General Inform	nation										ion Info			- i	1.1	
Agency						la re e			-	ration,		1.000		-		
Analyst						2/20/2	024		-	а Тур	e	Other				
Jurisdiction				Time F	Period				PHE	F		1.00		\$ 7		7
Urban Street		Wacker/JFK		Analys	sis Year	2024			Ana	alysis	Period	1> 7:0	00	-		
Intersection		Wacker/JFK 5-6PM		File Na	ame	TUES	DAY Int	erse	ction	(Wac	ker-JFK)_10YE	ARpr		6 1 5	Γ
Project Descrip	tion	Wacker/JFK TUESI	DAY											1 7	4144	20
Demand Inform	nation				EB			٧	VB			NB			SB	
Approach Move	ement			L	T	R	L	Т	T	R	L	T	R	L	T	R
Demand (v), v	eh/h			414	2	57	10	Т	9	12	120	666	6	9	431	23
Signal Informa	ition				7		1215	Т.	. 5_							
Cycle, s	54.1	Reference Phase	2]	7	50		,E	3 2	1		•	>	Ψ		4
Offset, s	0	Reference Point	End	Green	0.4	4.3	15.0		0.7	2.2	0.0		1	2	3	<u> </u>
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	3.		3.0	0.0				7	+
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2		2.5	0.0		5	0	7	
Timer Results				EBI		EBT	WBI		W	BT	NBI		NBT	SBI		SBT
Assigned Phase	Δ					4	***		8		5		2	1		6
Case Number	c			_		10.0	_	-	12	_	1.1	_	4.0	1.1	_	4.0
				_	-		_	-				_			_	
Phase Duration		,		⊢	_	16.2	_	-	7.	_	9.7	-	24.8	5.4	_	20.5
Change Period,				_	_	5.5	_	_	5.	_	5.0	_	5.5	5.0	_	5.5
Max Allow Head						3.3		_	3.		3.1		3.1	3.1	-	3.1
Queue Clearan	ce Time	(gs), S				9.7		_	2.	.5	5.1		12.2	2.1		6.9
Green Extensio	n Time	(ge), S				1.0			0.	.0	0.2		2.5	0.0		2.5
Phase Call Prol	bability					1.00		\neg	0.3	37	0.90		1.00	0.08	3	1.00
Max Out Proba	bility					0.00		\neg	0.0	00	0.00		0.00	0.00		0.00
Movement Gro	oup Res	ults			EB			W	В			NB			SB	
Approach Move	ement			L	T	R	L	Т	$\neg \vdash$	R	L	Т	R	L	Т	R
Assigned Move	ment			7	4	14	3	8		18	5	2	12	1	6	16
Adjusted Flow F	Rate (v), veh/h		207	266		16		\neg	15	153	430	428	5	203	18
		ow Rate (s), veh/h/l	n	1810	1767		1843		1	1657	1810	1900	1894	1810	1900	167
Queue Service				5.6	7.7		0.5		_	0.5	3.1	10.2	10.2	0.1	4.7	4.9
Cycle Queue C				5.6	7.7		0.5		\rightarrow	0.5	3.1	10.2	10.2	0.1	4.7	4.9
Green Ratio (g		5 (g t), 5		0.20	0.20		0.04		-	0.04	0.39	0.36	0.36	0.1	0.28	0.2
				357	348		76		_	69	479	679	677	232	526	46
Capacity (c), v		Hip (V)					0.213		_				0.633			
Volume-to-Capa			,	0.580	0.763		0.210		0	.214	0.320	0.633	0.000	0.023	0.386	0.4
		t/In (95 th percentile		97	132		9			8	46	156	155	2	80	75
	*	eh/ln (95 th percenti		3.9	5.3		0.4		_	0.3	1.8	6.2	6.2	0.1	3.2	3.
Queue Storage	Ratio (RQ) (95 th percent	tile)	0.19	0.26		0.20		_	0.18	0.24	0.31	0.31	0.03	0.16	0.1
Uniform Delay ((d1), s	/veh		19.7	20.5		25.1		2	25.1	11.5	14.5	14.5	14.5	15.9	15
Incremental De	lay (d 2), s/veh		0.6	1.3		0.5			0.6	0.1	0.2	0.2	0.0	0.2	0.:
Initial Queue De	elay (d	з), s/veh		0.0	0.0		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.
Control Delay (d), s/ve	eh		20.3	21.9		25.6		2	25.7	11.6	14.7	14.7	14.5	16.0	16
Level of Service				С	С		С			С	В	В	В	В	В	В
Approach Delay				21.2		С	25.6		C		14.2	_	В	16.0		В
Intersection Del							5.5							В		
	ay, arve	200				- 1										
	sults				EB			W	B			NB			SB	
Militimodal Po	ultimodal Results destrian LOS Score / LOS				LD			VV	J			ND			30	
		/108		2.29		В	2.29	1	В	2 1	1.89		В	2.09)	В

Table 94. Wacker Dr and JFK Rd Tuesday 5-6PM HCS 10 Year Projected Conditions Optimized

		HCS	S Sigr	nalize	d Inte	ersect	ion R	esu	lts Su	nmary	/				_
General Inform	ation								Interse	ction Inf	ormatio	nn	1 8	41.0.	яŲ
Agency	iation								Duration		1.000			4.1	
Analyst				Analys	sic Date	e 2/20/2	024		Area Ty	,	Other		- 2		
Jurisdiction				Time F		2/20/2	.024		PHF	pe	1.00				
		Wasker IEV		-		- 2024				Dorind	1> 7:	20	4		7
Urban Street Intersection		Wacker/JFK Wacker/JFK 5-6PM		File Na		2024	DAV Int	0500	Analysis				- 5		
	lian			File IV	anne	TUES	DAT IIII	ersec	ction (Wa	LKEI-JFF	()_1016	ARpi	- 4	* † *	26
Project Descript	lion	Wacker/JFK TUESI	DAT											3.1.4	× 11
Demand Inform	nation				EB		Т	V	/B	$\overline{}$	NB		$\overline{}$	SB	_
Approach Move	ment			L	Т	R	L	Τ.	T R		T	R		Т	R
Demand (v), v				414	2	57	10		9 12	120	666	6	9	431	235
Signal Informa	tion				Ţ	$\overline{}$	1215	Т.	5_	\neg			.		
Cycle, s	54.0	Reference Phase	2	1		542	7 SA	"⊭	7		`	-	Ψ		-4
Offset, s	0	Reference Point	End	Green	0.4	4.4	15.0	10	0.4 2.2	0.0		1	2	3	¥
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	3.		_	_			7	→
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.		0.0		6	0	7	
Timer Results				EBI	L	EBT	WB	L	WBT	NB	L	NBT	SBI	L	SBT
Assigned Phase	Э					4			8	5		2	1		6
Case Number						10.0			12.0	1.1		4.0	1.1		4.0
Phase Duration	hase Duration, s					15.9			7.7	9.8		24.9	5.4		20.5
Change Period,	hange Period, (Y+R c), s					5.5			5.5	5.0		5.5	5.0		5.5
Max Allow Head	dway (/	ИАН), s				3.3			3.2	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	(gs), S				9.7			2.5	5.0		12.1	2.1		6.9
Green Extensio	n Time	(ge), S				0.7		\neg	0.0	0.3		2.5	0.0		2.5
Phase Call Prof	bability					1.00			0.37	0.90)	1.00	0.08	3	1.00
Max Out Probal	bility					0.09			0.00	0.00)	0.00	0.00)	0.00
Mayamant Cra	un Dos	ulto			EB			W	,		NB			SB	
Movement Gro		uits		L	T	R	L	T	R	1	T	R	.	T	R
Approach Move				7	4	14	3	8	18	5	2	12	1	6	16
Assigned Move		\ vah/h		207	266	14	16	ŏ	15	153	428	426	5	203	187
Adjusted Flow F			-	_			_		_	_			<u> </u>		-
-		w Rate (s), veh/h/l	П	1810	1767		1843		1657	1810	1900	1894	1810	1900	167
Queue Service				5.6 5.6	7.7		0.5		0.5	3.0	10.1	10.1	0.1	4.7	4.9
Cycle Queue Cl		e nine (gc), s								_				-	0.28
Green Ratio (g.				0.19 350	0.19 342		0.04 77		0.04	0.39 483	0.36 683	0.36 681	0.29 236	0.28 528	466
Capacity (c), v		tio (V)													
Volume-to-Capa			0	0.591 97	0.778		0.212 9		0.213	-	0.626	0.626	0.022	0.385	0.40
		t/In (95 th percentile eh/In (95 th percenti	,	3.9	133 5.3		0.4		0.3	45 1.8	153 6.1	152 6.1	0.1	3.2	75 3.0
		RQ) (95 th percent	_	0.19	0.27		0.4		0.3	0.23	0.1	0.1	0.1	0.16	0.15
Uniform Delay (- 7 3	uic)	19.8	20.7		25.0		25.0	11.3	14.3	14.3	14.4	15.8	15.9
,	7,								_	-					_
Incremental Del				0.6	1.5		0.5		0.6	0.1	0.2	0.2	0.0	0.2	0.2
Initial Queue De				0.0 20.4	0.0 22.2		0.0 25.5		0.0 25.6	0.0 11.4	0.0 14.5	0.0 14.5	0.0 14.4	0.0 15.9	16.1
Control Delay (Level of Service				20.4 C	C C		25.5 C		25.6 C	B	14.5 B	14.5 B	14.4 B	15.9 B	10. B
	<u> </u>			_		С	-	_		-			_		_
Approach Delay				21.4	+		25.6		С	14.0	,	В	16.0		В
Intersection Del	ay, s/ve	m / LOS				16	5.5						В		
Multimodal Po	eulte				EB			W	R		NB			SB	
	ultimodal Results edestrian LOS Score / LOS					В	2.29	_	В	1.89		В	2.09		В
i euconidii LUS	Score	/ 200		2.29	<u> </u>	A	2.28		A	1.03	-	A	2.08		ь

Table 95. Pennsylvania Ave and JFK Rd Tuesday 11AM-Noon HCS 20 Year Projected Conditions

				iuii20	u 11110	ersect	ion it	CSUI	to oun	iiiiai y					
General Inform	nation								Intersec	tion Inf	ormatio	on	1 4	410.	ьŲ
Agency	iution								Duration		1.000			4.4	
Analyst				Apalyo	sic Date	e 2/15/2	2024		Area Typ	,	Other		- 5		
Jurisdiction				Time F		2/13/2	2024		PHF	ie .	1.00				-
		John F Kannady				- 2024				Dorind	_		- 3 -		-
Urban Street		John F Kennedy	IFIZ			r 2024	DAV Int		Analysis		1> 12		- 3		
Intersection	A:	11am-12pm Penn/J	FK	File Na	ame	TUES	DAY IN	ersec	tion (Pen	n-JFK)_	ZUYEA	Rproje	- 6	4144	
Project Descrip	tion													N I NY	MIII.
Demand Inform	nation				EB		$\overline{}$	W	В	$\overline{}$	NB		$\overline{}$	SB	
Approach Move	ement			L	Т	R	L	T	R	L	T	R	L	T	R
Demand (v), v	eh/h			200	229	133	102	18	7 118	145	739	85	99	704	17
a: 11 f															
Signal Informa		Poforonce Phase	2		1 6		245		1	2	₩.			7	→
Cycle, s	80.1	Reference Phase	_		5	50	7 M	7	' R	R		1	2	3	
Offset, s	0 Yes	Reference Point	End	Green		1.4	26.3	6.3		16.3	3				
Uncoordinated		Simult. Gap E/W	On	Yellow		0.0	4.0	4.0		4.0	`	7	Ψ	Z	4
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	2 0.0	1.2		6	0	7	¥
Timer Results				EBI		EBT	WB	L	WBT	NBI		NBT	SBI		SBT
Assigned Phase	e			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1	\neg	3.0	1.1		4.0	1.1		4.0
Phase Duration	hase Duration, s					24.5	11.5	5	21.5	12.8	3	32.7	11.4	1	31.4
Change Period,	change Period, (Y+R c), s					5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Head				3.1		3.2	3.1		3.2	3.1		3.1	3.1		3.1
Queue Clearan				9.0		18.0	5.5		9.2	7.4		24.2	4.7		19.7
Green Extensio				0.3		1.2	0.1	-	1.3	0.3	-	3.4	0.1	-	2.5
Phase Call Prol	bability			1.00		1.00	0.90		1.00	0.99		1.00	0.89		1.00
Max Out Proba	bility			0.00		0.00	0.00)	0.00	0.00		0.08	0.00)	0.72
		14						10/5			ND			0.0	
Movement Gro		suits			EB	R	L	WE	R		NB T	R	.	SB T	П
Approach Move				L	_		_	_		L	_		L	_	R
Assigned Move) val h /h		3	8	18	7	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	14	1	6	16	5	2	12
Adjusted Flow F			-	200	362		102	187		191	551	532	99	457	420
		ow Rate (s), veh/h/l	n	1767	1740		1767	1856		1838	1856	1788	1838	1856	172
Queue Service				7.0	16.0		3.5	7.2		5.4	22.2	22.2	2.7	17.6	17.
		e Time (g ε), s		7.0	16.0		3.5	7.2		5.4	22.2	22.2	2.7	17.6	17.
Green Ratio (g				0.32	0.24		0.28	0.20	_	0.42	0.34	0.34	0.41	0.33	0.3
Capacity (c), v		E- /)/)		430	419	-	245	_		334	640	617	256	608	566
Volume-to-Capa		_ · ·	A	0.465	0.864		0.416	-		0.571	0.861	0.862	0.387	0.752	-
		t/In (95 th percentile		127	277 10.8		66	142 5.6		96	330	312	50	325	30
		eh/ln (95 th percenti	-	5.0 0.70	0.00		2.6 0.57	0.00	_	3.8 0.96	12.9	12.5	1.9 0.42	0.00	0.0
Uniform Delay (RQ) (95 th percent	iiie)	21.3	29.2		23.5	28.3		17.7	24.5	24.5	18.9	24.0	24.
Incremental De	. ,,			0.3	2.5		0.4	0.4		0.3	1.2	1.3	0.4	4.8	5.2
Initial Queue De				0.0	0.0		0.4	0.4		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (21.6	31.6		23.9	28.7		18.0	25.7	25.8	19.2	28.9	29.
Level of Service				C	C		C	C	C	В	C	C	B	C	C
Approach Delay				28.1		С	27.2		C	24.6		С	28.1		C
Intersection Delay				20.1			6.6			24.0			C 20.		
	,														
Multimodal Re	sults				EB			WE	3		NB			SB	
Pedestrian LOS	destrian LOS Score / LOS					В	2.29	9	В	2.10		В	1.91		В
Bicycle LOS Sc	ore / LO	OS		1.41		Α	1.16	6	Α	1.29)	Α	1.30)	Α

Table 96. Pennsylvania Ave and JFK Rd Tuesday 11AM-Noon HCS 20 Year Projected Conditions Optimized

		HCS	Sigr	nalize	d Int	ersec	tion F	Resul	ts Sun	nmary	,				
General Inform	nation								Intersec	tion Inf	ormatio	on	1 4	41.01	يد ال
Agency									Duration	, h	1.000)		4.1	.
Analyst				Analys	sis Dat	e 2/15/	2024	\neg	Area Typ	e	Other		-		
Jurisdiction				Time F	Period				PHF		1.00		3 -2		
Urban Street		John F Kennedy				r 2024		\rightarrow	Analysis	Period	1> 12	-00			-
Intersection		11am-12pm Penn/J	FK	File Na				_	ion (Pen				-		
Project Descrip	tion	Trum Izpini Cinio	110	T IIC 14	umo	TIOL	JD/11 11	11013001	ion (i cin	1011()_	2012/0	тъгојо	-	4142	2.0
1 Toject Descrip	LIOII														
Demand Inform	nation		_		EB			W	3	$\overline{}$	NB			SB	
Approach Move				L	ΤŢ	R	1	Т Т	R	1	T	T R	1	T	R
Demand (v), v				200	229		_			145	739	85	99	704	179
Belliana (v), v	CHINI		-	200	220	100	101	- 10	110	140	133	00	- 55	704	113
Signal Informa	ation				ΙŪ					$\overline{}$	8				5
Cycle, s	82.5	Reference Phase	2	1	2				4	R	F .		<u> </u>	- ≻	₹-
Offset, s	0	Reference Point	End		1				_ S			1	2	3	4
Uncoordinated	Yes	Simult. Gap E/W	On	Green		1.5	28.0			16.3	3 L				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow Red	1.2	0.0	4.0	1.2		4.0 1.2		1	Y	7	↔ .
1 orce wode	Tixeu	Ollifult. Oap 14/0	OII	IXeu	1.2	0.0	11.1	1.2	0.0	1.2				-	
Timer Results				EBI		EBT	W	RI T	WBT	NB		NBT	SBI		SBT
Assigned Phase				3	-	8	7		4	1	-	6	5		2
	ase Number				+	4.0	1.	-	3.0	1,1	_	4.0	1.1	_	4.0
	hase Duration, s				-		-	-		_	-			-	
	nase Duration, s hange Period, (Y+R c), s				-	24.8	11.	_	21.5	13.0	_	34.6	11.5	_	33.1
				5.2	_	5.2	5.	_	5.2	5.2	_	5.1	5.2	-	5.1
Max Allow Head				3.1	_	3.2	3.	_	3.2	3.1	_	3.1	3.1	_	3.1
Queue Clearan				9.2	-	18.6	5.	-	9.5	7.4	-	24.6	4.8	-	20.0
Green Extension	n Time	(ge), S		0.4		0.7	0.	_	8.0	0.4	\rightarrow	4.6	0.2	_	4.6
Phase Call Pro	bability			1.00		1.00	0.9	1	1.00	0.99	9	1.00	0.90)	1.00
Max Out Proba	bility			0.00		0.00	0.0	0	0.32	0.00		0.01	0.00		0.00
Movement Gro	oup Res	sults			EB		_	WB			NB			SB	
Approach Move				L	T	R	1	T	R	L	T	R		T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow I) veh/h		200	362	10	102	187	118	191	551	532	99	457	426
		ow Rate (s), veh/h/l	n	1767	1740		1767	_	112	1838	1856	1788	1838	1856	1725
			11		16.6	-	3.7	7.5	5.4	5.4	22.6	22.6	2.8	18.0	18.0
Queue Service				7.2	16.6	_	3.7	7.5	5.4	5.4	22.6	22.6	2.8	18.0	18.0
Cycle Queue C		e fille (gr), s			-	-	0.28	-	_	_	_	_		_	
Green Ratio (g				0.32	0.24	-				0.44	0.36	0.36	0.42	0.34	0.34
Capacity (c), v				426	416	+	240	368	312	342	666	641	262	632	587
Volume-to-Cap				0.470	0.869	'	0.426			0.558	0.828	0.829	0.378	0.724	0.725
	v - m	t/In (95 th percentile	,	132	287	-	69	150	92	98	337	319	51	307	283
		eh/ln (95 th percenti		5.2	11.2	_	2.7	5.9	3.6	3.8	13.2	12.8	2.0	12.0	11.3
		RQ) (95 th percent	ile)	0.73	0.00		0.60	0.00		0.98	0.00	0.00	0.42	0.00	0.00
Uniform Delay	(d1), s	/veh		22.2	30.4		24.7	29.8	28.9	17.6	24.3	24.4	18.8	24.0	24.0
Incremental De	cremental Delay (d 2), s/veh						0.4	0.5	0.3	0.3	0.6	0.6	0.3	0.6	0.6
Initial Queue De	itial Queue Delay (d s), s/veh						0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (ontrol Delay (d), s/veh						25.2	30.3	29.2	17.9	25.0	25.0	19.2	24.6	24.7
Level of Service	evel of Service (LOS)				С		С	С	С	В	С	С	В	С	С
Approach Delay	pproach Delay, s/veh / LOS				i	С	28	.7	С	23.9		С	24.1	1	С
Intersection De	tersection Delay, s/veh / LOS					2	5.5						С		
Multim - d-1 C	Itimodal Results							14/5			NE			0.0	
	Itimodal Results						-	WB			NB			SB	
	destrian LOS Score / LOS					В	2.2	-	В	2.10	-	В	1.91	-	В
Bicycle LOS Sc	/cle LOS Score / LOS					Α	1.1	6	Α	1.29)	Α	1.30)	Α

Table 97. Pennsylvania Ave and JFK Rd Tuesday 4-5PM HCS 20 Year Projected Conditions

		HCS	Sigr	nalize	d Inte	ersect	ion R	esult	ts Sun	nmary	,				
Consentinform	4:									4: 1				41.0.	VIII
General Inform	nation							_	Intersec				- i		
Agency						-		\rightarrow	Duration	,	1.000		-		
Analyst				Analys	sis Dat	e 2/15/2	2024	$\overline{}$	Area Typ	e	Other				· L
Jurisdiction				Time F	eriod				PHF		1.00		3		=
Urban Street		John F Kennedy		Analys	sis Yea	r 2024			Analysis	Period	1> 12	:00	4		
Intersection		4-5pm Penn/JFK		File Na	ame	TUES	DAY Int	ersect	ion (Peni	n-JFK)_	20YEA	Rproje		5 1 5	
Project Descrip	tion												1	4144	21
Demand Inform	nation				EB			WE	2		NB		1	SB	
Approach Move				L	Τ	R	1	T	R	T.	T	R	1	T	R
				210	359		93	286		144	_	71	99	739	172
Demand (v), v	en/n			210	339	1117	93	200	90	144	/6/	/1	99	739	1/2
Signal Informa	tion				7	\top	215	1 2	2	2	2	راد	L. I	_	4
Cycle, s	87.1	Reference Phase	2		5	50	z 51	2 [Æ	R	E	<u>۱</u> ۳		-	Y
Offset, s	0	Reference Point	End	Green	6.1	1.9	26.3	6.3	3.4	22.4	1		2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	4.0	0.0	4.0			SÎZ		7
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		6	0	7	<u>-</u> ♦
Timer Results				EBI	L	EBT	WB	L	WBT	NB	L	NBT	SBI	-	SBT
Assigned Phase	е			1.1	\perp	8	7		4	1		6	5		2
Case Number					\perp	4.0	1.1	\perp	3.0	1.1	-	4.0	1.1		4.0
Phase Duration	ase Duration, s			14.9	_	31.0	11.5	_	27.6	13.2	_	33.3	11.3	_	31.4
Change Period,	nange Period, (Y+Rc), s			5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Head	dway (/	MAH), s		3.1		3.1	3.1		3.1	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	(gs), S		9.4		24.4	5.2		13.8	7.7		26.5	4.6		18.8
Green Extensio	n Time	(ge), S		0.3		1.3	0.1		1.7	0.3		1.7	0.1		0.0
Phase Call Prof	bability			0.99		1.00	0.89	9	1.00	0.99)	1.00	0.87	7	1.00
Max Out Probal	bility			0.00		0.12	0.00	0	0.00	0.00		0.48	0.00		1.00
Movement Gro	un Res	eulte			EB			WB			NB			SB	
Approach Move		ruita		L	T	R	L	T	R	1	T	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
		\ .uab/b		210	476	10	93	286	90	180	544	528	84	400	375
Adjusted Flow F			_												_
		ow Rate (s), veh/h/l	П	1767	1777		1767	1856		1838	1856	1801	1838	1856	1734
Queue Service Cycle Queue C				7.4	22.4		3.2	11.8	3.9	5.7	24.4	24.5	2.6	16.7 16.7	16.8 16.8
Green Ratio (g		e nine (gr), s		0.37	0.30		0.33	0.26		0.39	0.32	0.32	0.37	0.30	0.30
				412	527		225	478	405	330	601	583	222	561	524
Capacity (c), v		tio (V)			_					0.546			_	0.714	_
Volume-to-Capa		· ·	N	0.510	0.903		0.414	0.598			0.905	0.905	0.379		
		t/ln (95 th percentile		135	422		61	225 8.8	66	106	399	381	50	281	262
		eh/ln (95 th percenti RQ) (95 th percent	_	5.3 0.74	16.5 0.00		0.53	0.00	2.6 0.57	1.06	15.6 0.00	15.2 0.00	1.9 0.41	11.0 0.00	10.5
			iiie)	20.6	29.4		23.5	28.4	25.5	19.9	28.2	28.2	21.9	27.1	27.1
	niform Delay (d 1), s/veh				13.6		0.5	0.4	0.1	0.3	7.9	8.1	0.3	2.4	2.6
	cremental Delay (d 2), s/veh itial Queue Delay (d 3), s/veh				0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ontrol Delay (d), s/veh				43.0		23.9	28.8	-	20.2	36.1	36.3	22.1	29.5	29.7
	evel of Service (LOS)				D		C	C	C	C	D D	D	C	C	C
	pproach Delay, s/veh / LOS				3	D	27.2		C	33.9		C	28.9		C
	tersection Delay, s/veh / LOS						21.2		-	33.8			C 20.8		
Multimodal Re	ltimodal Results							WB			NB			SB	
Pedestrian LOS	destrian LOS Score / LOS					В	2.28	8	В	2.11	1	В	1.92	2	В
Picycle LOS Sc	cle LOS Score / LOS					В	1.26	6	Α	1.31	1	Α	1.32	2	Α

Table 98. Pennsylvania Ave and JFK Rd Tuesday 4-5PM HCS 20 Year Projected Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	ion R	esul	ts Sun	nmary	,				
General Inform	nation								Intersec	tion Inf	ormatio	on	1	420.	je lj
Agency									Duration	, h	1.000)		4.1	
Analyst				Analys	is Date	2/15/2	2024		Area Typ	e	Other		4		
Jurisdiction				Time F	Period				PHF		1.00		3 = 7		-
Urban Street		John F Kennedy		Analys	is Yea	2024			Analysis	Period	1> 12	2:00			-
Intersection		4-5pm Penn/JFK		File Na			DAY Int	_	ion (Pen		20YEA	Rproje	-		
Project Descrip	tion	r opinir onniorite		1		1.020							-	4144	21
T Tojoci Boscip	tion														
Demand Inform	nation				EB		$\overline{}$	WE	3	$\overline{}$	NB		$\overline{}$	SB	
Approach Move	ement			L	Т	R	T L	T	R		T	R	L	Т	R
Demand (v), v				210	359	117	93	286		144	787	71	99	739	172
201112112 (7);	-			2.0			-				101				
Signal Informa	ition				T,		215	\top	\neg	\top	5		1		
Cycle, s	95.1	Reference Phase	2	1	"	F.4		2 P		ĸ	Ş		<u> </u>	⋰	↔
Offset, s	111	Reference Point	End	1	()	51						1	2	3	4
Uncoordinated	Yes	Simult. Gap E/W	On	Green		0.7	32.2	6.5 4.0	4.1 0.0	4.0	— l		rt-	_	_
Force Mode	Fixed		On	Red	1.2	0.0	4.0 1.1	1.2	0.0	1.2		X	Y	7	↔
. Si co illiodo		Canala Sup 1475	311	1100	1.2	0.0	11.1	1.2	10.0	1.2					
Timer Results				EBI		EBT	WB		WBT	NBI		NBT	SBI		SBT
Assigned Phas	0			3		8	7	-	4	1		6	5		2
Case Number	e			1.1	_	4.0	1.1	_	3.0	1.1	_	4.0	1.1	_	4.0
	hase Duration, s							-			_			-	
	hase Duration, s hange Period, (Y+R ε), s				3	34.0	11.7	_	29.9	12.2	_	37.9	11.5	_	37.3
				5.2	_	5.2	5.2	_	5.2	5.2	_	5.1	5.2	-	5.1
Max Allow Hea				3.1	_	3.1	3.1	_	3.1	3.1	_	3.1	3.1	-	3.1
Queue Clearan		12 //		10.0		26.5	5.6	_	15.0	8.1	_	28.1	4.8	-	19.6
Green Extension	n Time	(ge), S		0.4	\perp	1.7	0.2		1.7	0.0		4.1	0.2		4.2
Phase Call Pro	bability			1.00)	1.00	0.92	2	1.00	0.99)	1.00	0.90)	1.00
Max Out Proba	bility			0.00		0.00	0.00		0.00	1.00		0.02	0.00)	0.00
		14						WD			NID			0.0	
Movement Gro		suits			EB			WB		.	NB			SB	
Approach Move				L	T	R	<u> </u>	T	R	L	T	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow	Rate (v), veh/h		210	476		93	286	90	180	544	528	84	400	375
		ow Rate (ε), veh/h/l	n	1767	1777		1767	1856	1212	1838	1856	1801	1838	1856	1734
Queue Service				8.0	24.5		3.6	13.0	4.3	6.1	26.1	26.1	2.8	17.5	17.6
Cycle Queue C	learanc	e Time (g ε), s		8.0	24.5		3.6	13.0	4.3	6.1	26.1	26.1	2.8	17.5	17.6
Green Ratio (g	/C)			0.39	0.30		0.33	0.26	0.26	0.42	0.35	0.35	0.41	0.34	0.34
Capacity (c), v	/eh/h			412	542		222	484	411	326	644	625	226	632	590
Volume-to-Cap	acity Ra	atio (X)		0.509	0.879		0.418	0.590	0.219	0.553	0.845	0.845	0.372	0.634	0.636
Back of Queue	(Q), f	t/ln (95 th percentile)	149	401		68	246	74	118	394	375	53	287	266
		eh/ln (95 th percenti		5.8	15.7		2.7	9.6	2.9	4.6	15.4	15.0	2.1	11.2	10.6
		RQ) (95 th percent		0.82	0.00		0.60	0.00	0.64	1.18	0.00	0.00	0.44	0.00	0.00
			-,	22.0	31.8		25.8	31.1	27.9	20.4	29.1	29.1	22.4	26.7	26.8
	Iniform Delay (d 1), s/veh ncremental Delay (d 2), s/veh						0.5	0.4	0.1	0.7	0.7	0.7	0.3	0.3	0.3
	itial Queue Delay (d 2), s/veh						0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ontrol Delay (d), s/veh						26.2	31.6		21.1	29.8	29.8	22.7	27.0	27.1
	evel of Service (LOS)							-	-		C C	_			-
							C	C	C	C		C	C	C	C
	pproach Delay, s/veh / LOS					С	29.8	5	С	28.6)	С	26.6)	С
intersection De	tersection Delay, s/veh / LOS					2	3.6						С		
Multimodal Da	ultimodal Results							MD			NID			CD.	
	ultimodal Results					D	2.24	WB	D	2.44	NB	D	4.00	SB	D
	edestrian LOS Score / LOS					В	2.29	-	В	2.11	-	В	1.92	-	В
RICYCLE LOS So	ycle LOS Score / LOS					В	1.26	0	Α	1.31		Α	1.32	2	Α

Table 99. Pennsylvania Ave and JFK Rd Tuesday 5-6PM HCS 20 Year Projected Conditions

		HCS	S Sigr	nalize	d Inte	ersect	ion R	esul	ts Sun	nmary	,				
														41.0.	- 1
General Informa	ition							\rightarrow	Intersect				- i		
Agency						I		\rightarrow	Duration,		1.000				
Analyst						2/15/2	024	\rightarrow	Area Typ	е	Other		_=		٠.
Jurisdiction				Time F	Period				PHF		1.00				7
Urban Street		John F Kennedy		Analys	sis Year	2024			Analysis	Period	1> 12	:00	7		
Intersection		5-6pm Penn/JFK		File Na	ame	TUES	DAY Int	ersect	ion (Penr	n-JFK)_	20YEAI	Rproje		* 1 3	
Project Description	on												1	41427	21
Demand Informa	ation				EB			WE	3		NB			SB	
Approach Movem	nent			L	Τ	R	L	ΤŢ	R	L	T	R	L	Т	T R
Demand (v), vel				220	388	135	121	30		162	927	95	126	792	212
<u> </u>															
Cycle, s	on 90.9	Reference Phase	2		7		1212	_	4	R	; ;;;		<u> </u>	,	♦
Offset, s	0	Reference Point	End		1	T)			F			1	2	3	
	Yes	Simult, Gap E/W	On	Green		1.3	26.8	6.7	3.4	25.6					
	Fixed	Simult. Gap N/S	On	Yellow Red	1.2	0.0	1.1	1.2	0.0	1.2		X	Ψ.	✓ ,	-
Force Widde F	-ixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		6	0	- 1	
Timer Results				EBI		EBT	WB	L	WBT	NBI	-	NBT	SBI		SBT
Assigned Phase				3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration,	•				3	34.3	11.9)	30.8	12.8	3	33.2	11.5	5	31.9
Change Period, (hange Period, (Y+R c), s					5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Heady	lax Allow Headway (MAH), s					3.1	3.1		3.1	3.1		3.1	3.1		3.1
Queue Clearance	e Time	(gs), S		9.8		27.9	6.3		14.8	7.5		26.4	5.1		18.9
Green Extension	Time ((ge), S		0.3		1.2	0.2		1.8	0.3		1.6	0.1		0.0
Phase Call Proba	ability			1.00		1.00	0.95	5	1.00	0.98		1.00	0.91		1.00
Max Out Probabil	lity			0.00		0.48	0.00		0.00	0.00		0.46	0.00		1.00
Movement Grou	n Res	ults			EB			WB			NB			SB	
Approach Movem	•	uito		L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movem				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Ra		\ voh/h		220	523	10	121	305	105	162	520	502	94	386	359
			n	1767	1773		1767	1856		1838	1856	1794	1838	1856	1720
Queue Service Ti		w Rate (s), veh/h/l	11	7.8	25.9		4.3	12.8	_	5.5	24.4	24.4	3.1	16.9	16.9
Cycle Queue Cle				7.8	25.9		4.3	12.8		5.5	24.4	24.4	3.1	16.9	16.9
Green Ratio (g/C		rime (yt), s		0.40	0.32		0.36	0.28		0.38	0.31	0.31	0.37	0.29	0.29
				426	567		221	524	444	314	574	555	218	547	507
Capacity (c), vel		tio (V)			0.922							0.906			
Volume-to-Capac				0.516	509		0.548	_	-	0.516	0.906	454	0.429 59	0.706	0.70
		In (95 th percentile		142 5.5	19.9		81 3.2	9.4	78 3.1	105 4.1	476 18.6	18.2	2.3	285	263 10.5
		h/In (95 th percenti RQ) (95 th percent		0.78	0.00		0.70	0.00		1.05	0.00	0.00	0.49	0.00	0.00
Uniform Delay (_			20.1	29.8		23.8	28.0	_	21.3	30.1	30.1	23.2	28.5	28.6
Incremental Dela		0.4	21.3		0.8	0.4	0.1	0.5	14.9	15.4	0.3	2.3	2.5		
Initial Queue Dela				0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d		**		20.5	51.1		24.6	28.4		21.7	45.1	45.5	23.5	30.8	31.1
Level of Service (С	D		С	С	С	С	D	D	С	С	С
Approach Delay,		LOS		42.0		D	26.9		С	42.1		D	30.1		С
ntersection Delay, s/veh / LOS							6.6						D		
	ultimodal Deculte														
Multimodel Des	ulte													0.0	
Multimodal Resi		1100		2.28	EB	В	2.28	WB	В	2.11	NB	В	1.92	SB	В

Table 100. Pennsylvania Ave and JFK Rd Tuesday 5-6PM HCS 20 Year Projected Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	ion R	esult	s Sun	ımary					
General Inform	ation								ntersec	tion Inf	ormatic	\n	1 4	Albert	кU
Agency	ation								Duration.		1.000			4.4	
				Anabia	in Data	DIALE	1024	_			Other		-		
Analyst						2/15/2	2024	-	Area Typ	е					٠.
Jurisdiction				Time F		10004			PHF		1.00				-
Urban Street		John F Kennedy			sis Year		50711		Analysis		1> 12		_ =		
Intersection		5-6pm Penn/JFK		File Na	ame	TUES	DAY Int	ersecti	on (Peni	1-JFK)_	20YEA	Rproje		414	
Project Descript	ion													414~	74 F
Demand Inform	nation				EB		\top	WB	}		NB			SB	
Approach Move	ment			L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), v	eh/h			220	388	135	121	305	105	162	927	95	126	792	21
Signal Informat	tion										8				
Cycle, s	97.9	Reference Phase	2	1	2		12.4.2	<u>_</u>	4	R	}		<u> </u>	⋰ │	Ð
Offset, s	106	Reference Point	End		()	1.11	7 5	()	Š			1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Green		1.6	30.4	6.8	4.0	27.9	<u> </u>		-4-	_	_
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	4.0	1.2	0.0	1.2		5	Y		₩
1 Orde Would	INCU	Onnuit. Oap 14/5	OII	iven	1.4	10.0	11.1	1.2	0.0	1.2					
Timer Results				EBI		EBT	WB	L	WBT	NBI	L	NBT	SBI	L	SBT
Assigned Phase)			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration,	s			16.0		37.2	12.0		33.1	13.3	3	37.1	11.7	7	35.5
Change Period,	(Y+R	c), S		5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Head	lway (/	MAH), s		3.1	\neg	3.1	3.1		3.1	3.1		3.1	3.1		3.1
Queue Clearand	ce Time	e (g s), S		10.3	3	29.7	6.7		15.8	7.8		27.8	5.3		19.9
Green Extension	n Time	(ge), S		0.4		1.9	0.2		1.9	0.3		3.9	0.1		3.8
Phase Call Prob	ability			1.00		1.00	0.96	6	1.00	0.99		1.00	0.92	2	1.00
Max Out Probab	oility			0.00		0.00	0.00		0.00	0.00		0.00	0.00		0.03
Movement Gro	un Ros	eulte			EB			WB			NB			SB	
Approach Move		Juits		L	T	R	L	Т	R	L	T	R	L	T	R
Assigned Mover				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow F) voh/h		220	523	10	121	305	105	162	520	502	94	386	359
-		ow Rate (s), veh/h/l	n	1767	1773		1767	1856	1572	1838	1856	1794	1838	1856	172
Queue Service				8.3	27.7		4.7	13.8	5.0	5.8	25.8	25.8	3.3	17.8	17.
Cycle Queue Cl				8.3	27.7		4.7	13.8	5.0	5.8	25.8	25.8	3.3	17.8	17.
Green Ratio (a)		5 .ano (g t), 5		0.41	0.33		0.36	0.29	0.29	0.40	0.33	0.33	0.38	0.31	0.3
Capacity (c), v				426	581		218	531	450	320	608	588	220	577	53
Volume-to-Capa		atio (X)		0.517	0.901		0.556			0.506	0.855	0.855	0.425	0.669	0.67
		t/In (95 th percentile)	154	443		89	258	86	112	430	408	64	298	27
		eh/In (95 th percenti		6.0	17.3		3.5	10.1	3.4	4.4	16.8	16.3	2.5	11.6	11.
		RQ) (95 th percent	-	0.85	0.00		0.78	0.00	0.75	1.12	0.00	0.00	0.53	0.00	0.0
Uniform Delay (-,	21.2	31.6		25.8	30.1	26.9	22.0	30.9	30.9	24.3	29.5	29.
Incremental Del				0.4	2.2		0.8	0.4	0.1	0.5	1.4	1.4	0.3	0.4	0.4
Initial Queue De	lay (d	з), s/veh		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/ve	eh		21.6	33.8		26.6	30.4	27.0	22.4	32.3	32.4	24.6	29.9	30.
Level of Service	(LOS)			С	С		С	С	С	С	С	С	С	С	С
Approach Delay	, s/veh	/LOS		30.2	2	С	28.9	9	С	31.0)	С	29.3	3	С
Intersection Del	tersection Delay, s/veh / LOS					30	0.1						С		
	ultimodal Poculte														
Multimedal Da	nulta													CD.	
Multimodal Res		/1.06		2.28	EB	В	2.29	WB	В	2.11	NB	В	1.92	SB	В

Table 101. Wacker Dr and JFK Rd Tuesday 11AM-Noon HCS 20 Year Projected Conditions

		нся	S Sigr	nalize	d Inte	ersect	ion R	esu	lts Sun	nmary	,				
Canagal Inform	. ation								Internes	tion luf				4.40.	e ti
General Inforn	nation								Intersec				ı i	١.١	
Agency						la ia a ia			Duration	,	1.000		- 2		
Analyst						2/20/2	024		Area Typ	e	Other				
Jurisdiction				Time F		-			PHF		1.00		- E	7,5	7
Urban Street		Wacker/JFK				2024			Analysis		1> 7:0		_5		
Intersection		Wacker/JFK 11AM-		File Na	ame	TUES	DAY Int	erse	ction (Wad	ker-JFK	()_20YE	ARpr		* 1 3	
Project Descrip	tion	Wacker/JFK TUESI	DAY					_						414	21
Demand Inforr	nation				EB			V	/B		NB			SB	
Approach Move	ement			L	Т	R	L	Т	T R	L	T	R	L	Т	R
Demand (v), v	eh/h			349	7	60	7		2 7	94	602	6	16	471	260
Signal Informa	54.3	Reference Phase	2		7		245	L	, Ħ		Į		stz.		A
Cycle, s	0	Reference Point	End		1	1 Sti	:					1	2	3	- ∳ ₄
Offset, s Uncoordinated	Yes	Simult. Gap E/W		Green		4.4	16.3	9.		0.0					4
			On	Yellow		0.0	4.0	3.		0.0		ነ . 'ዻ	,	-∕` .	V
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.	5 2.5	0.0		8	0	-/	3
Timer Results				EBI		EBT	WBI	L	WBT	NBI		NBT	SBI		SBT
Assigned Phas	e					4			8	5		2	1		6
Case Number						10.0			12.0	1.1		4.0	1.1		4.0
Phase Duration	hase Duration, s				\neg	15.4		\neg	6.8	10.3	3	26.2	5.9		21.8
Change Period	nange Period, (Y+R c), s					5.5		\neg	5.5	5.0		5.5	5.0		5.5
Max Allow Hea	dway (/	MAH), s				3.2		\neg	3.2	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	e (g s), S				9.1		\neg	2.2	5.4		16.7	2.3		9.6
Green Extension	n Time	(ge), S				8.0		\neg	0.0	0.2		3.8	0.0		3.9
Phase Call Pro	bability					1.00			0.22	0.93	3	1.00	0.18	3	1.00
Max Out Proba	bility					0.00			0.00	0.00)	0.00	0.00)	0.00
Movement Gro	oun Res	sults			EB			W	R.		NB			SB	
Approach Move		Juits		L	T	R	L	T	_	L	T	R	L	T	R
Assigned Move				7	4	14	3	8	_	5	2	12	1	6	16
Adjusted Flow I) veh/h		175	242		8	Ť	8	178	576	574	13	308	277
		ow Rate (s), veh/h/l	ln .	1810	1761		1824		1630	1810	1900	1893	1810	1900	1674
Queue Service				4.8	7.1		0.2		0.2	3.4	14.7	14.7	0.3	7.4	7.6
Cycle Queue C				4.8	7.1		0.2		0.2	3.4	14.7	14.7	0.3	7.4	7.6
Green Ratio (g		(3 - // -		0.18	0.18		0.02		0.02	0.43	0.38	0.38	0.32	0.30	0.30
Capacity (c), v				332	323		44		39	448	725	723	200	571	503
Volume-to-Cap		itio (X)		0.526	0.747		0.191		0.194	0.397	0.795	0.795	0.064	0.540	0.550
		t/In (95 th percentile	e)	82	122		5		4	50	191	190	4	126	114
		eh/ln (95 th percent		3.3	4.9		0.2		0.2	2.0	7.6	7.6	0.2	5.0	4.5
		RQ) (95 th percent		0.16	0.24		0.11		0.10	0.26	0.38	0.38	0.07	0.25	0.23
Uniform Delay				20.1	21.1		26.1		26.1	10.9	15.0	15.0	14.2	15.9	16.0
Incremental De				0.5	1.3		0.8		0.9	0.1	0.3	0.3	0.0	0.2	0.3
	itial Queue Delay (d 3), s/veh			0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (20.6	22.4		26.9		27.0	11.0	15.3	15.3	14.2	16.1	16.3
Level of Service	evel of Service (LOS)			С	С		С		С	В	В	В	В	В	В
Approach Dela	pproach Delay, s/veh / LOS			21.6	j	С	26.9)	С	14.7	7	В	16.2	2	В
Intersection De	tersection Delay, s/veh / LOS					16	i.4						В		
Multimodal Do	ultimodal Results				EB			W	D.		NB			SB	
	ultimodal Results destrian LOS Score / LOS			2.20	_	В	2 20	_		1.00		D	2.00		В
				2.29	$\overline{}$		0.50	\rightarrow	Β Δ	1.89	\rightarrow	B	2.09	$\overline{}$	A
Dicycle LOS St	cycle LOS Score / LOS			1.17		Α	0.50		Α	1.07		Α	1.10	,	М

Table 102. Wacker Dr and JFK Rd Tuesday 11AM-Noon HCS 20 Year Projected Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	ion R	esu	lts Su	mmar	/				
General Inform	nation								Interse	ction In	formatio	on	1	4761	يا او
Agency									Duratio	n, h	1.000)		4.1	
Analyst				Analys	is Date	e 2/20/2	024		Area T	pe	Other	7	=		
Jurisdiction				Time F	eriod				PHF		1.00		3 ₹		÷
Urban Street		Wacker/JFK		Analys	sis Year	r 2024			Analys	s Period	1> 7:	00	4		
Intersection		Wacker/JFK 11AM-	NOON	File No		-	DAY Int	erse		cker-JFI			-		
Project Descrip	tion	Wacker/JFK TUESI		1 110 111		1.020	D/11 III	0,00	011011 (111	01.01.01.1	t <u></u>	or to open	- 4	414**	2 (
T TOJOCE DOSCH	tion	TVackeror IC TOZO	,,,,												
Demand Inform	nation				EB		$\overline{}$	V	/B	$\overline{}$	NB		$\overline{}$	SB	
Approach Move					Т	R		Т.	T R	L	T	R	1	Т	R
Demand (v), v				349	7	60	7	_	2 7		602		16	471	260
Bomana (v), v	OTIVITY .		_	010	-		-			- 01	002		- 10	47.1	200
Signal Informa	ation				I L		215	\top	7	\neg	_				
Cycle, s	54.2	Reference Phase	2	1	"			- ⊨ 2	: A		•	<u> </u>	₩		
Offset, s	0	Reference Point	End			<u>I Sîlî</u>						1	2	3	Y
Uncoordinated	Yes	Simult. Gap E/W	On	Green		4.5	16.0	_	0.0 1.3					,	4
Force Mode	Fixed	Simult. Gap N/S	On	Yellow Red	1.5	0.0	1.5	3. 2.				\		- ⁄-,	Y
1 orce widge	rixed	Official Cap N/S	OII	rieu	1.0	10.0	1.0	۷.	J Z.:	, [U.U		-	0	,	-
Timer Desults				EBI		EBT	WB		WBT	NB		NBT	SBI		SBT
Timer Results	_			EBI	-		WB	-			_			-	
Assigned Phas	е			_	_	4	\vdash	-	8	5		2	1	\rightarrow	6
Case Number				_	_	10.0	_	-	12.0	1.1	-	4.0	1.1	-	4.0
Phase Duration					_	15.5		_	6.8	10.	_	26.0	5.9	_	21.5
Change Period	, (Y+R	ε), S				5.5		_	5.5	5.0	-	5.5	5.0	_	5.5
Max Allow Hea	dway (/	MAH), s				3.2		_	3.2	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	e (gs), s				9.1			2.2	5.4	1	16.7	2.3		9.6
Green Extension	n Time	(ge), S				0.9			0.0	0.3	3	3.6	0.0		3.0
Phase Call Pro	bability					1.00		\neg	0.22	0.9	3	1.00	0.18	3	1.00
Max Out Proba	bility					0.00			0.00	0.0	0	0.08	0.00)	0.32
Movement Gro	oun Res	sults			EB			W	B		NB			SB	
Approach Move		Junto		L	T	R	L	T	R	1	T	R	L	T	R
Assigned Move				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow) voh/h		175	242	14	8	-	8	178	575	573	13	308	277
			-				_	_	_						_
		ow Rate (s), veh/h/l	n	1810	1761		1824	-	1630	-	1900	1893	1810	1900	1674
Queue Service				4.7	7.1		0.2	_	0.2	3.4	14.7	14.7	0.3	7.4	7.6
-		e Time (g ε), s		4.7	7.1		0.2		0.2	3.4	14.7	14.7	0.3	7.4	7.6
Green Ratio (g				0.18	0.18		0.02	_	0.02	-	0.38	0.38	0.32	0.30	0.30
Capacity (c), v				334	325		44		40	449	722	720	199	564	497
Volume-to-Cap				0.522	0.742		0.190		0.19	-	0.797	0.797	0.064	0.547	0.558
		t/ln (95 th percentile		82	121		5		4	50	190	189	4	127	114
		eh/In (95 th percenti		3.3	4.9		0.2		0.2	2.0	7.6	7.6	0.2	5.1	4.6
Queue Storage	Ratio (RQ) (95 th percent	ile)	0.16	0.24		0.11		0.10	0.25	0.38	0.38	0.07	0.25	0.23
Uniform Delay	(d 1), S	/veh		20.1	21.0		26.1		26.1	10.9	15.0	15.0	14.3	16.1	16.2
Incremental De	lay (d 2), s/veh		0.5	1.3		8.0		0.9	0.1	0.3	0.3	0.0	0.3	0.3
Initial Queue D	elay (d	3), s/veh		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/v	eh		20.5	22.3		26.8		27.0	11.0	15.3	15.3	14.4	16.4	16.5
Level of Service				С	С		С		С	В	В	В	В	В	В
Approach Dela	• •			21.5		С	26.9		С	14.	7	В	16.4	1	В
Intersection De							5.4						В		
Multimodal Re	Itimodal Results				EB			W	В		NB			SB	
Pedestrian LOS	destrian LOS Score / LOS					В	2.29)	В	1.8	9	В	2.09)	В
Bicycle LOS So	cle LOS Score / LOS			1.17	7	Α	0.50)	Α	1.0	7	Α	1.10)	Α

Table 103. Wacker Dr and JFK Rd Tuesday 4-5PM HCS 20 Year Projected Conditions

		HCS	Sigr	nalize	d Inte	ersect	ion R	esi	ılts Suı	nmary	,				
General Inforn	nation								Interse	ction Inf	ormatio	on	- i	476	, L
Agency									Duration	1, h	1.000)		***	
Analyst				Analys	sis Date	e 2/20/2	2024		Area Ty	pe	Other		±.		
Jurisdiction				Time F	Period				PHF		1.00		\$ *		7
Urban Street		Wacker/JFK		Analys	sis Yea	r 2024			Analysis	Period	1> 7:	00	-		
Intersection		Wacker/JFK 4-5PM		File N	ame	TUES	DAY Int	erse	ction (Wa	cker-JFk	()_20YE	ARpr		5 1 5	
Project Descrip	tion	Wacker/JFK TUESI	DAY										1	4141	2 (
Damand Info	4:				ED.				N/D		NID			0.0	
Demand Inform					EB		+ -	_	VB	+ -	NB		+ .	SB	
Approach Move				L	T	R	L		T R	L	T	R	L	T	R
Demand (v), v	/eh/h		_	423	2	77	6		11 7	116	715	6	24	560	260
Signal Informa	ation				ΙŢ.			Т	R						
Cycle, s	53.9	Reference Phase	2	1	"	F.4		"E	7 7		•	`	V		4
Offset, s	0	Reference Point	End		()	51		Ĩ,	9			1	2	3	Y
Uncoordinated		Simult. Gap E/W	On	Green	_	3.4	15.0	_	1.4 1.8					,	→
Force Mode	Fixed	Simult. Gap N/S	On	Yellow Red	1.5	0.0	1.5		.0 3.0 .5 2.5) [-1			
1 SICC WIOUC	1 IVEG	Gariaic Gap 14/3	Oli	INCU	1.3	0.0	1.0	14	[2.3	10.0					
Timer Results				EBI	L	EBT	WB	L	WBT	NB	L	NBT	SBI		SBT
Assigned Phas	е					4		\neg	8	5	\neg	2	1	\neg	6
Case Number						10.0			12.0	1.1		4.0	1.1		4.0
Phase Duration	1. S				\neg	16.9			7.3	9.1	-	23.9	5.7	-	20.5
	nange Period, (Y+R c), s					5.5			5.5	5.0	_	5.5	5.0	-	5.5
Max Allow Hea					\neg	3.3			3.2	3.1	-	3.1	3.1	-	3.1
Queue Clearan						10.4			2.4	4.4		10.3	2.2	-	6.3
Green Extension		12 11			_	1.0			0.0	0.1	-	2.0	0.0	-	2.0
Phase Call Pro		(9-7,-		_		1.00			0.30	0.82	-	1.00	0.14	\rightarrow	1.00
Max Out Proba					_	0.00			0.00	0.00		0.00	0.00		0.00
Movement Gro	oup Res	sults			EB			W	_	_	NB			SB	
Approach Move	ement			L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move	ement			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow I	Rate (v), veh/h		212	291		13		11	116	361	360	10	179	168
Adjusted Satura	ation Flo	ow Rate (ε), veh/h/l	n	1810	1757		1856		1711	1810	1900	1894	1810	1900	1699
Queue Service	Time (g s), S		5.6	8.4		0.4		0.3	2.4	8.3	8.3	0.2	4.1	4.3
Cycle Queue C	learanc	e Time (gε), s		5.6	8.4		0.4		0.3	2.4	8.3	8.3	0.2	4.1	4.3
Green Ratio (g	7/C)			0.21	0.21		0.03		0.03	0.36	0.34	0.34	0.29	0.28	0.28
Capacity (c), v	/eh/h			384	373		63		58	481	649	648	269	529	473
Volume-to-Cap		atio (X)		0.550	0.779		0.201		0.198	0.241	0.556	0.556	0.038	0.339	0.355
		t/ln (95 th percentile)	96	142		7		6	36	138	137	4	69	65
	V - 77	eh/ln (95 th percenti	,	3.8	5.7		0.3		0.3	1.4	5.5	5.5	0.1	2.8	2.6
		RQ) (95 th percent		0.19	0.29		0.15		0.14	0.19	0.28	0.27	0.06	0.14	0.13
Uniform Delay			-,	18.9	20.0		25.3		25.3	11.9	14.4	14.4	14.0	15.5	15.6
Incremental De				0.5	1.4		0.6		0.6	0.1	0.3	0.3	0.0	0.1	0.2
Initial Queue De		**		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (19.4	21.4		25.9		25.9	12.0	14.7	14.7	14.1	15.6	15.7
Level of Service				В	C		C		C	В	В	В	В	В	В
Approach Delay				20.5		C	25.9		C	14.3		В	15.6		В
Intersection De	• •			20.			6.6		U	14.			B		
TO STORY DO	, 0.70														
Multimodal Re	Itimodal Results				EB			W	В		NB			SB	
Pedestrian LOS	Score	/LOS		2.29	9	В	2.29)	В	1.90)	В	2.09)	В
Bicycle LOS So	estrian LOS Score / LOS cle LOS Score / LOS				2	Α	0.51		Α	1.18	3	Α	1.18	3	Α

Table 104. Wacker Dr and JFK Rd Tuesday 4-5PM HCS 20 Year Projected Conditions Optimized

		HCS	S Sigr	nalize	d Inte	ersect	ion R	esu	ılts Sur	nmary	,				
General Inform	nation								Intersec	tion Inf	ormatic			4.6	KT.
	iation	1							_		_		- 6	1.1	
Agency									Duration		1.000		-		
Analyst						e 2/20/2	2024		Area Typ	oe	Other				
Jurisdiction				Time F					PHF		1.00		_∰-÷		7
Urban Street		Wacker/JFK		Analys	is Yea	r 2024			Analysis	Period	1> 7:0	00	100		
Intersection		Wacker/JFK 4-5PM		File Na	ame	TUES	DAY Int	erse	ction (Wad	ker-JFk	()_20YE	ARpr		5 1 3	
Project Descrip	tion	Wacker/JFK TUESI	DAY										7	4144	21
Demand Inform	nation				EB			V	VB		NB			SB	
Approach Move					Τ	R	1	_	T R	1	T	T R	1	T	□ R
Demand (v), v				423	2	77	6	-	11 7	116	715	6	24	560	260
Demand (V), V	en/ii		-	423		- 11	•		11 7	110	713	-	24	300	200
Signal Informa					7	\top	215	Τ,	. 🖫	\top	Ī		-4-		_
Cycle, s	54.0	Reference Phase	2	ı	5	150	Z 51	7F				-	\mathbf{Y}		₩.
Offset, s	0	Reference Point	End	Green	0.7	3.4	15.0		1.5 1.8	0.0		- 1	1 4	٥	-
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	3.		0.0			N	7	→
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.		0.0		6	0	7	•
Timer Results				EBI		EBT	WB	L	WBT	NB	L	NBT	SBI	L	SBT
Assigned Phase	е					4			8	5		2	1		6
Case Number						10.0			12.0	1.1		4.0	1.1		4.0
Phase Duration	1, S					17.0			7.3	9.1		23.9	5.7		20.5
Change Period,	, (Y+R	c), S				5.5			5.5	5.0		5.5	5.0		5.5
Max Allow Head	dway (MAH), s				3.3		\neg	3.2	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	e (a s). S				10.4			2.4	4.4		10.4	2.2		6.3
Green Extensio						1.1		\neg	0.0	0.2	-	2.0	0.0		2.0
Phase Call Prol		(3-7/-				1.00			0.30	0.83	3	1.00	0.14	1	1.00
Max Out Proba						0.00		_	0.00	0.00	_	0.00	0.00	-	0.00
Mayamant Cra	шь Пас	ulto			EB			W	n		NB			SB	
Movement Gro Approach Move		Suits		L	T	R	L	T	_		T	R		T	R
				_	_			_		_	_		_	_	-
Assigned Move				7	4	14	3	8		5	2	12	1	6	16
Adjusted Flow F		**		212	291	-	13	_	11	116	361	360	10	179	168
		ow Rate (ε), veh/h/l	n	1810	1757		1856		1711	1810	1900	1894	1810	1900	1699
Queue Service				5.6	8.4		0.4		0.4	2.4	8.4	8.4	0.2	4.1	4.3
Cycle Queue C		e iiine (gc), s		5.6 0.21	8.4 0.21		0.4		0.4	0.36	8.4 0.34	8.4 0.34	0.2	0.28	0.28
Green Ratio (g				387	376		63		58	480	648	646	268	527	472
Capacity (c), v		His ()()													
Volume-to-Capa			٥.	0.546	0.772		0.199		0.196	0.242	0.557	0.557	0.038	0.340	0.35
		t/In (95 th percentile		96	143		7		6	36	138	138	0.1	70	66
		eh/ln (95 th percent RQ) (95 th percent		3.8 0.19	5.7 0.29		0.3		0.3	1.5 0.19	5.5 0.28	5.5 0.28	0.1	0.14	0.13
Uniform Delay (uic)	18.9	20.0		25.4		25.4	12.0	14.5	14.5	14.1	15.6	15.7
Incremental De	· · · ·			0.4	1.3		0.6		0.6	0.1	0.3	0.3	0.0	0.1	0.2
Initial Queue De	- / \	**		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (19.4	21.3		26.0		26.0	12.1	14.8	14.8	14.2	15.7	15.8
Level of Service				B	C		C		C	B	В	B	B	B	B
Approach Delay	• •			20.5		С	26.0		C	14.4		В	15.7		В
Intersection Del							6.6						В		
	Itimodal Results				EB		-	W			NB			SB	
Pedestrian LOS				2.29	-	В	2.29	\rightarrow	В	1.90	-	В	2.09	-	В
Bicycle LOS Sc	ore / LO	OS		1.32	2	Α	0.51		Α	1.18	3	Α	1.18	3	Α

Table 105. Wacker Dr and JFK Rd Tuesday 5-6PM HCS 20 Year Projected Conditions

		HCS	Sigr	nalize	d Inte	ersect	ion R	esi	ılts Su	mm	ary	,				
General Inform	nation								Inters	ection	Info	ormatic	on	1	43.00	35 L
Agency									Duratio	n, h		1.000			4.1	.
Analyst				Analys	sis Date	2/20/2	2024		Area T	уре		Other		4.		4
Jurisdiction				Time F	Period				PHF			1.00		3 4		
Urban Street		Wacker/JFK		Analys	sis Year	2024			Analys	is Per	iod	1> 7:0	00	-		
Intersection		Wacker/JFK 5-6PM		File N			DAY Int	erse	ction (W) 20YE	ARpr		* + 4	·
Project Descrip	tion	Wacker/JFK TUESI	DAY	1								/		- 4	4144	21
Demand Inforr	nation				EB		Т	٧	VB	\neg		NB		$\overline{}$	SB	
Approach Move	ement			L	Т	R	1	Т	T F		L	Т	T R	L	Т	R
Demand (v), v				458	2	63	11		10 1	3	133	736	6	10	476	260
								Ė								
Signal Informa	ition				7		215	Т.	. 5			l				_
Cycle, s	56.2	Reference Phase	2		7	51	a 50	zΕ	3 7				Y	Ψ		↔.
Offset, s	0	Reference Point	End	Green	0.4	4.8	15.0	1	1.9 2.	5	0.0		-	2	0	M 4
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0		.0 3.	_	0.0	-		N	<i>></i>	→
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5		.5 2.		0.0		6	0	7	8
Timer Results				EBI	L	EBT	WB	L	WBT		NBL		NBT	SBI	-	SBT
Assigned Phas	е					4			8		5		2	1		6
Case Number						10.0			12.0	Т	1.1		4.0	1.1		4.0
Phase Duration						17.4			8.0	Т	10.3		25.3	5.4		20.5
Change Period	, (Y+R	ε), S				5.5			5.5	Т	5.0		5.5	5.0		5.5
Max Allow Hea	dway (/	MAH), s				3.3		\neg	3.2	Т	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	e (g s), S				10.8			2.5	\top	5.5		13.9	2.1		7.9
Green Extension	n Time	(ge), S				1.1		\neg	0.0	\top	0.2	$\neg \neg$	2.8	0.0		2.8
Phase Call Pro	bability					1.00			0.41		0.93		1.00	0.09	9	1.00
Max Out Proba	bility					0.00			0.00		0.00		0.00	0.00		0.00
Movement Cre	un Doc	nulte			EB			W	ID.	7		NB			SB	
Movement Gro Approach Move		suits		L	T	R	L	T	_	-	L	T	R	L	T	R
				7	4	14	3	8		_	5	2	12	1	_	
Assigned Move					_	14	_	- °			_				6	16
Adjusted Flow I		**		229	294	-	18	_	16	_	68	470	469	6	229	209
-		ow Rate (ε), veh/h/l	n	1810	1767		1843	_	165	_	310	1900	1894	1810	1900	1677
Queue Service				6.4	8.8	_	0.5	_	0.5	_	.5	11.9	11.9	0.1	5.6	5.9
•		e Time (gε), s		6.4	8.8		0.5		0.5	_	.5	11.9	11.9	0.1	5.6	5.9
Green Ratio (g				0.21	0.21		0.04		0.04	_	39	0.35	0.35	0.27	0.27	0.27
Capacity (c), v				384	375		81		73	_	55	671	669	206	507	447
Volume-to-Cap				0.596	-	-	0.219	_	0.22	_	370	0.700	0.700	0.029	0.451	0.468
		t/ln (95 th percentile	,	111	152		10		9	_	53	175	175	2	99	91
		eh/In (95 th percenti		4.4	6.1		0.4		0.4	_	.1	7.0	7.0	0.1	4.0	3.6
		RQ) (95 th percent	tile)	0.22	0.30		0.22		0.20		27	0.35	0.35	0.04	0.20	0.18
Uniform Delay				20.0	20.9		25.9		25.9	_	2.0	15.6	15.6	15.6	17.2	17.3
Incremental De				0.6	1.4		0.5		0.6	$\overline{}$.1	0.3	0.3	0.0	0.2	0.2
Initial Queue D		••		0.0	0.0		0.0		0.0	_	.0	0.0	0.0	0.0	0.0	0.0
Control Delay (20.5	22.3		26.4		26.	$\overline{}$	2.1	15.9	15.9	15.6	17.4	17.5
Level of Service				С	C		С	L,	C	_	В	В	В	В	В	В
Approach Delay				21.5	5	С	26.5	5	С		15.3		В	17.4		В
Intersection De	tersection Delay, s/veh / LOS					1	7.5							В		
Multimada! D	ıltimodal Results				EE			10	'D			ND			OB	
		/1.00		2.00	EB	D	2.00	W		-	4.00	NB	n	2.44	SB	D.
Pedestrian LOS				2.29	\rightarrow	В	2.29	\rightarrow	В	_	1.90	_	В	2.10	\rightarrow	В
Bicycle LOS So	core / LO	JS		1.35)	Α	0.52	<u> </u>	Α		1.21		Α	1.10)	Α

Table 106. Wacker Dr and JFK Rd Tuesday 5-6PM HCS 20 Year Projected Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	ion R	esı	ılts S	Sum	mary	,				
General Inform	nation								Inter	rsect	tion Inf	ormatio	on	1	4101	يا ي
Agency									Dura	ation,	h	1.000			4 + 7	
Analyst				Analys	sis Date	2/20/2	2024		Area	Тур	е	Other		3.		
Jurisdiction				Time F	Period				PHF			1.00		1 ×		<u>,</u>
Urban Street		Wacker/JFK		Analys	sis Year	2024			Anal	lysis	Period	1> 7:0	00	7		
Intersection		Wacker/JFK 5-6PM		File N		-	DAY Int	erse) 20YE	ARpr		K + 4	
Project Descrip	tion	Wacker/JFK TUESI										-		- 1	4144	21
r reject 2 cccnp		110000000000000000000000000000000000000														
Demand Inform	nation				EB		\top	٧	VΒ		$\overline{}$	NB		Т	SB	
Approach Move	ement			L	Т	R	L	Т	тТ	R	T	T	R	L	Т	R
Demand (v), v				458	2	63	11		10	13	133	736	6	10	476	260
								ė							-	
Signal Informa	ition				T,			Т	5_		\top					
Cycle, s	55.6	Reference Phase	2	1	E	5.4		"E	3 7			•	Y	Ψ		4
Offset, s	0	Reference Point	End		100			ij,	1.6	2.5	100		1	2	3	4
Uncoordinated	Yes	Simult. Gap E/W	On	Green Yellow		4.6 0.0	15.0 4.0	_	_	2.5 3.0	0.0				,	→
Force Mode	Fixed	· ·	On	Red	1.5	0.0	1.5			2.5	0.0		5	0	7	
	· inou	Siait. Gap 14/0	0			10.0	1	-			0.0					
Timer Results				EBI		EBT	WB		WB	RT	NBI	$\overline{}$	NBT	SBI	$\overline{}$	SBT
Assigned Phas	Δ					4		_	8	_	5		2	1		6
Case Number				_		10.0			12.0	-	1.1	_	4.0	1.1		4.0
	nase Duration, s			_	-	17.1	_		8.0	_	10.0		25.1	5.4	-	20.5
	*			_	_	5.5	_		5.5	_	5.0		5.5	5.4	_	5.5
	nange Period, (Y+R c), s			-	-		_			-		_		_	_	
Max Allow Hea				⊢	_	3.3	_		3.2	_	3.1	_	3.1	3.1	-	3.1
Queue Clearan				_	_	10.8	_		2.5		5.5	_	13.9	2.1	_	7.8
Green Extension		(g e), S		<u> </u>	_	0.8	_	_	0.0	-	0.0		2.8	0.0	_	2.8
Phase Call Pro					_	1.00			0.4	_	0.93	_	1.00	0.09	_	1.00
Max Out Proba	bility					0.07			0.00	0	1.00		0.00	0.00		0.00
Movement Gro	oup Res	sults			EB			W	'B			NB			SB	
Approach Move				L	Т	R	L	T	-	R	L	Т	R	L	Т	R
Assigned Move				7	4	14	3	8	1	18	5	2	12	1	6	16
Adjusted Flow		/) veh/h		229	294		18			16	169	472	470	6	229	209
		ow Rate (s), veh/h/l	n	1810	1767		1843		_	659	1810	1900	1894	1810	1900	1677
Queue Service				6.4	8.8		0.5		_	0.5	3.5	11.9	11.9	0.1	5.6	5.8
		gs), s e Time (gε), s		6.4	8.8		0.5		_	0.5	3.5	11.9	11.9	0.1	5.6	5.8
Green Ratio (o mile (gt), s		0.4	0.21		0.04		_	.04	0.39	0.35	0.35	0.1	0.27	0.27
				378	369		82	Н	_	74	453	669	667	204	513	453
Capacity (c), v		atio (V)		0.605	0.796		0.219		_	219	0.373	0.705	0.705	0.029	0.446	0.462
Volume-to-Cap			١				_		_	9						
		t/ln (95 th percentile		110	151		10		_	_	53	175	175	2	97	89
		eh/ln (95 th percenti		4.4	6.1		0.4		_).4	2.1	7.0	7.0	0.1	3.9	3.6
		RQ) (95 th percent	iie)	0.22	0.30		0.22		_	.20	0.27	0.35	0.35	0.04	0.19	0.18
Uniform Delay				19.9	20.9		25.6	_	-	5.6	12.1	15.5	15.5	15.4	16.8	16.9
Incremental De				0.6	1.5		0.5		$\overline{}$	0.6	0.1	0.3	0.3	0.0	0.2	0.2
Initial Queue D		**		0.0	0.0		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/v	eh		20.5	22.4		26.1		$\overline{}$	6.2	12.2	15.8	15.8	15.4	17.0	17.2
Level of Service	e (LOS)			С	С		С			С	В	В	В	В	В	В
Approach Dela	y, s/veh	/LOS		21.6	6	С	26.2	2	С		15.3	3	В	17.1		В
Intersection De	lay, s/ve	eh / LOS				17	7.4							В		
	ultimodal Doculto															
	ultimodal Results				EB			W				NB			SB	
Pedestrian LOS				2.29	-	В	2.29	\rightarrow	В	-	1.90	\rightarrow	В	2.10	\rightarrow	В
Bicycle LOS So	/cle LOS Score / LOS				5	Α	0.52	2	Α		1.21		Α	1.10)	Α

Saturday, February 10th, 2024, Highway Capacity Software Tables:

Table 5. Pennsylvania Ave and JFK Rd Saturday Noon-1PM HCS Existing Conditions

						ersect		Count		····· ,					
General Inforn	antion								Intersec	tion Inf				14241	NU
	nation							\rightarrow			1.000		1	411	
Agency				Anabu	ia Dat	- E14100	20.4	-	Duration,		_		2		
Analyst Jurisdiction						e 5/1/20	124	-	Area Typ PHF	e	Other				-
		IEIX D4		Time F		- 0004				Dariad	1.00				-
Urban Street		JFK Rd		Analys		-		_	Analysis		1> 7:0	00	-		
Intersection	tion			File Na	ame	wack	er_Penr	EXIST	ng Upda	te 12-1.	xus		- 4	117	200
Project Descrip	tion												-		P. III
Demand Inform	mation				EB			WB	3	$\overline{}$	NB			SB	
Approach Move				L	T	R	T.	T	R	L	Т	R	1	T	R
Demand (v), v				174	148		103	_		140	717	87	88	760	15
Demand (v);					110	120	100		12					100	
Signal Informa	ition				T	$\overline{}$	725	\top	\neg	\top	5.				-5
Cycle, s	66.5	Reference Phase	2	1	1 6	50		2 L		R	è	\ 4	P _	∠	Z
Offset, s	0	Reference Point	End	Green	5.6	0.8	20.2	6.0	1.5	11.6		1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	4.0	0.0	4.0	L		SÎZ	/	7
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		5	6	7	- ♦
Timer Results				EBI	L	EBT	WB	L	WBT	NBI		NBT	SBI		SBT
Assigned Phas	e			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	hase Duration, s				6	18.3	11.2	2	16.8	11.7		26.2	10.8	3	25.3
Change Period	hange Period, (Y+R c), s					5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Hea	dway (I	MAH), s		3.1		3.2	3.1		3.2	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	e (g =), s		7.2		12.2	5.0		6.1	5.4		14.8	4.1		17.6
Green Extension	n Time	(ge), s		0.3		0.9	0.1		0.9	0.2		3.7	0.1		2.6
Phase Call Pro	bability			1.00)	1.00	0.85	5	1.00	0.92	2	1.00	0.80		1.00
Max Out Proba	bility			0.00		0.00	0.00)	0.00	0.00)	0.01	0.00)	0.45
Movement Cr	un Bac	ulte			EB			WB			NB			SB	
Movement Gro	_	suits		L	T	I R	L	T	R	L	T	R	L	T	R
Approach Move				3	8	18	7	4	14	1	6	16	5	2	_
Assigned Move		\ voh/h		174	274	10	103	130	72	139	407	392	88	468	12 442
Adjusted Flow		-	n	1767	1714	-	1767	1856		1767	1856	1785	1767	1856	174
Queue Service		ow Rate (s), veh/h/l	11	5.2	10.2	-	3.0	4.1	2.6	3.4	12.8	12.8	2.1	15.6	15.6
		g s), s e Time (g o), s		5.2	10.2		3.0	4.1	2.6	3.4	12.8	12.8	2.1	15.6	15.0
Green Ratio (g		c rane (ge), s		0.29	0.20		0.26	0.17	0.17	0.40	0.32	0.32	0.39	0.30	0.3
Capacity (c), v				448	338		283	324	275	323	589	566	322	565	533
Volume-to-Cap		atio (X)		0.389	0.811		0.364	0.401		0.431	0.692	0.693	0.273	0.828	0.82
		t/In (95 th percentile	1	90	184		54	80	43	56	217	205	36	292	273
		eh/In (95 th percenti		3.5	7.2		2.1	3.1	1.7	2.2	8.5	8.2	1.4	11.4	10.
		RQ) (95 th percent		0.50	0.00		0.47	0.00	0.37	0.56	0.00	0.00	0.30	0.00	0.0
Uniform Delay			iiic)	18.9	25.5		20.1	24.4	2.2.	15.3	19.9	19.9	14.7	21.5	21.
Incremental De				0.2	1.8		0.3	0.3	0.2	0.3	0.5	0.5	0.2	6.0	6.4
Initial Queue D		,,		0.2	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Control Delay (19.1	27.4		20.3	24.7	23.9	15.6	20.3	20.4	14.9	27.5	27.
Level of Service				19.1 B	C C		20.3	C C	C C	15.6 B	20.3	20.4 C	14.9 B	C C	C C
Approach Dela				24.2		С	23.0		C	19.6		В	26.6		C
				24.2	-				C	19.6	,		C 26.6	,	-
Intersection De	idy, S/VE	:II / LUS				2.	3.3								
Multimodal Re	sults				EB			WB			NB			SB	
	edestrian LOS Score / LOS					В	2.28		В	2.10	_	В	1.91	_	В
- Cucsulan LO	cycle LOS Score / LOS					A	0.99	-	A	1.27	-	A	1.31	-	A

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Table 6. Pennsylvania Ave and JFK Rd Saturday Noon-1PM HCS Existing Conditions Optimized

		HCS	Sigr	ialize	u inte	rsect	ion R	esul	ts Sun	ımary					
														daet	VIII
General Inform	ation							\rightarrow	Intersec		_		- 6	4.4	
Agency						_		-	Duration,		1.000				
Analyst						5/1/20	24	_	Area Typ	е	Other	•			٠.
Jurisdiction		.= = .		Time F				_	PHF		1.00				÷
Urban Street		JFK Rd			is Year	-		\perp	Analysis		1> 7:0		7		
Intersection				File Na	ame	Wack	er_Penr	Exist	ing Upda	te 12-1	(Overal	I Dela		<u> 111</u>	
Project Descript	tion							_					1	4.44	HIN.
Demand Inforn	nation				EB			W	R		NB			SB	
Approach Move				L	T	R	L	T		1	T	R	1	T	R
Demand (v), v				174	148	126	103	13	_	140	717	87	88	760	15
Demand (v), v	CII/II			1/4	140	120	103	13	0 72	140	717	07	- 00	700	13
Signal Informa	tion				ΙŢ	$\overline{}$	1215	\top	$\overline{}$	\top	5				
Cycle, s	68.4	Reference Phase	2	1	8	54		2 H	Ħ	R	ş= "		P _	- ∕- ∣	7
Offset, s	76	Reference Point	End	0,,,,,	[7	100						1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Green Yellow	_	0.8	4.0	6.0 4.0	_	12.5 4.0	⊣ \		KŤ2	_	
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2		1.2		- 6	0	7	₹
Timer Results				EBI		EBT	WB	L	WBT	NBI	-	NBT	SBI	L	SBT
Assigned Phase				3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	, s			12.2	2	18.6	11.2	2	17.7	11.7		27.6	10.9)	26.8
Change Period,	(Y+R	c), s		5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Head	lway (/	MAH), s		3.1		3.2	3.1	\neg	3.2	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	(gs), s		7.4		12.5	5.1		6.2	5.4		15.0	4.2		17.8
Green Extensio	n Time	(ge), s		0.0		8.0	0.2	\neg	0.9	0.3		3.7	0.2		3.7
Phase Call Prot	ability			1.00		1.00	0.86	5	1.00	0.93		1.00	0.81	1	1.00
Max Out Probal	bility			1.00		0.01	0.00	_	0.00	0.00		0.00	0.00		0.00
Movement Gro		sults			EB			WB	_		NB		_	SB	_
Approach Move	ment			L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move	ment			3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow F	Rate (v), veh/h		174	274		103	130		139	407	392	88	468	44
Adjusted Satura	ition Flo	ow Rate (s), veh/h/l	n	1767	1714		1767	1856		1767	1856	1785	1767	1856	174
Queue Service				5.4	10.5		3.1	4.2	2.7	3.4	13.0	13.0	2.2	15.8	15.
Cycle Queue C		e Time (gε), s		5.4	10.5		3.1	4.2	2.7	3.4	13.0	13.0	2.2	15.8	15.
Green Ratio (g	/C)			0.29	0.20		0.27	0.18	0.18	0.42	0.33	0.33	0.40	0.32	0.3
Capacity (c), v	eh/h			443	337		279	340		328	612	589	330	591	55
Volume-to-Capa	acity Ra	tio (X)		0.393	0.812		0.370	0.382	2 0.250	0.425	0.666	0.667	0.267	0.793	0.79
Back of Queue	(Q), fl	t/In (95 th percentile)	94	192		55	82	44	57	219	208	36	269	25
		eh/ln (95 th percenti	_	3.7	7.5		2.2	3.2	1.7	2.2	8.6	8.3	1.4	10.5	10.
Queue Storage	Ratio (RQ) (95 th percent	tile)	0.52	0.00		0.48	0.00	0.38	0.57	0.00	0.00	0.30	0.00	0.0
Uniform Delay (d 1), s	/veh		19.6	26.4		20.4	24.6	24.0	15.2	19.8	19.8	14.6	21.4	21.
Incremental Del	lay (d 2), s/veh		0.2	1.8		0.3	0.3	0.2	0.3	0.4	0.4	0.2	0.9	1.0
Initial Queue De	elay (d	3), s/veh		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/ve	eh		19.8	28.2		20.7	24.9	24.2	15.4	20.2	20.2	14.7	22.3	22.
Level of Service	(LOS)			В	С		С	С	С	В	С	С	В	С	С
Approach Delay	, s/veh	/LOS		25.0		С	23.3	3	С	19.5		В	21.7	7	С
Intersection Del	ay, s/ve	h / LOS				21	1.6						С		
Multimodal Re					EB			WB			NB			SB	
Pedestrian LOS				2.28	-	В	2.28	-	В	2.10	-	В	1.91	-	В
Di	ore / LC)\$		1.23		Α	0.99)	Α	1.27		Α	1.31	1	Α

Table 7. Wacker Dr and JFK Rd Saturday Noon-1PM HCS Existing Conditions

			ŭ		d Inte											
General Inforn	astion								Int	0.000	tion Info	o ren atia	<u>.</u>		147741	E U
	iation	1										1.000	on	ĺ	41,	
Agency				Analis	in Dat-	E /4 /00	24		-	ration,		11111				
Analyst						5/1/20	24		-	еа Тур	8	Other				4
Jurisdiction		IEI C B I		Time F		0004			PHI		D	1.00		# →		*
Urban Street		JFK Rd		-	is Year	-		F	_	alysis		1> 7:0)0	- 5		
Intersection	41	JFK/Wacker		File Na	ame	wacke	er_Penn	EXIS	sting	Updat	e 12-1.	xus			ነተት	100
Project Descrip	tion														A 1 7	nui.
Demand Inforr	nation				EB			V	VB			NB			SB	
Approach Move				L	T	T R	L	_	T T	R	L	T	R	L	T	R
Demand (v), v				389	16	71	12	-	4	14	116	536	4	13	498	35
Bernana (v), v	OTHER TO			000	10		12				110	000			400	-
Signal Informa	tion				ΤŢ	$\overline{}$	IJ.	Т	~	$\overline{}$	\top	\neg				
Cycle, s	74.4	Reference Phase	2	1	E	517	7	" Ľ	;	1			L	Þ	-	-4
Offset, s	0	Reference Point	End	Green	10	4.5	24.1	1	7.8	4.6	0.0		1	2	3	<u> </u>
Uncoordinated	Yes	Simult. Gap E/W	Off	Yellow		0.0	4.0	3.		3.0	0.0	-			7	→
Force Mode	Fixed	Simult. Gap N/S	Off	Red	1.5	0.0	1.5	2.		2.5	0.0		5	6	7	
Timer Results				EBI	-	EBT	WBI	\neg	W	/BT	NBL	-	NBT	SBI		SBT
Assigned Phas	е					4		\Box	3	8	5		2	1		6
Case Number						10.0		\neg	12	2.0	2.0		4.0	2.0	\neg	4.0
Phase Duration	ı, S					23.3		\neg	10	0.1	11.4	. :	34.1	6.9		29.6
Change Period	, (Y+R	ε), S				5.5		\neg	5.	5.5	5.0		5.5	5.0		5.5
Max Allow Hea	dway (/	<i>МАН</i>), s				3.3		\neg	3.	3.2	3.1		3.0	3.1	\neg	3.2
Queue Clearan	ce Time	(g ₅), S				16.9		\neg	2.	2.6	6.8		9.8	2.6		21.8
Green Extension	n Time	(ge), S				0.9		\neg	0.	0.0	0.1		1.0	0.0		2.1
Phase Call Pro	bability					1.00		\Box	0.4	.46	0.91		1.00	0.26	5	1.00
Max Out Proba	bility					0.00		\Box	0.0	.00	0.00		0.00	0.00)	0.00
Mayamant Cre	un Des	lée			EB			W	B			NB			SB	
Movement Gro		uits		L	T	R	L	T		R	L	Т	R	L	T	T R
Approach Move				7	4	14	3	8	\rightarrow	18	5	2	12	1	6	16
Assigned Move		\ vob/b		_	359	14	16	0	+	14	116	270	270	15	524	
Adjusted Flow I			n	117					٠							451
		ow Rate (s), veh/h/l		1767 4.0	1731		1788 0.6		\rightarrow	1576 0.6	1767 4.8	1856 7.8	1851 7.8	1767 0.6	1856 19.8	159
Queue Service		· · ·		4.0	14.9		0.6		\rightarrow	0.6	4.8	7.8	7.8	0.6	19.8	19.8
Cycle Queue C Green Ratio (g		c inne (ye), s		0.24	0.24		0.06		-	0.06	0.09	0.38	0.38	0.6	0.32	0.3
Capacity (c), v				424	415		112		+	99	151	713	711	44	601	517
Volume-to-Cap		tio (X)		0.275	0.866		0.141		-	0.144	0.766	0.379	0.379	0.335	0.871	0.87
		t/In (95 th percentile	١	74	260		12		+	11	97	142	138	12	295	254
				2.9	40.4				+	-	3.8	5.5	5.5	0.5	11.5	10
		en/in (95 th percenti RQ) (95 th percent		0.15	0.52		0.5		\rightarrow	0.4	0.19	0.28	0.28	0.02	0.59	0.5
Uniform Delay			()	23.1	27.2		33.1		-	33.1	33.4	16.5	16.5	35.8	23.8	23.
Incremental De				0.1	3.0		0.2		\rightarrow	0.2	3.1	0.1	0.1	0.9	0.9	1.0
Initial Queue De		,-		0.0	0.0		0.2		-	0.2	0.0	0.0	0.0	0.9	0.9	0.0
Control Delay (23.2	30.2		33.3		-	33.3	36.5	16.7	16.7	36.6	24.6	24.
Level of Service				C C	00.2 C		00.0 C		+	C	D D	16. <i>1</i>	16.7 B	D	C C	24. C
Approach Dela				28.5		С	33.3			c	20.2		С	24.9		C
Intersection De				20.0	<u>′ </u>	24					20.2			24.5 C		
meracellon De	iay, sive	AT / EOO				24										
Multimodal Re	sults				EB			W	В			NB			SB	
	edestrian LOS Score / LOS					В	2.30	$\overline{}$		В	1.90		В	2.10		В
, Judgarian EUG	ore / LC			2.30 1.27	\rightarrow	A	0.51	\rightarrow		A	1.03	\rightarrow	A	1.20	_	A

Table 8.Wacker Dr and JFK Rd Saturday Noon-1PM HCS Existing Conditions Optimized

		нс	S Sigr	nalize	d Inte	ersect	ion R	esu	ılts Sur	nmary	,				
									_						
General Inform	nation								Intersec	tion Inf	ormatio	on	- é	4 1	× u
Agency									Duration	, h	1.000	1	-		
Analyst				Analys	is Date	5/1/20	24		Area Typ	e	Other		÷ 200		
Jurisdiction				Time F	Period				PHF		1.00		2 -		-
Urban Street		JFK Rd		Analys	is Year	2024			Analysis	Period	1> 7:0	00	7		
Intersection		JFK/Wacker		File Na	ame	Wacke	er_Penn	Exi	sting Upda	te 12-1	(Overal	II Dela		111	
Project Descrip	tion												1	4.44	HIT
Demand Inforn	nation				EB			٧	VB		NB			SB	
Approach Move	ment			L	Т	R	L	Т	T R	L	Т	R	L	Т	R
Demand (v), v	eh/h			389	16	71	12		4 14	116	536	4	13	498	355
Signal Informa	tion						TII	7	2		7				
Cycle, s	74.4	Reference Phase	2		1 2		14.	. Ŀ	: 洋			<u> </u>	t		_
Offset, s	0	Reference Point	End	L		500			ý.			1	2	3	<u> </u>
Uncoordinated	Yes	Simult. Gap E/W	Off	Green		4.5	24.0		7.8 4.6	0.0				_	4
Force Mode	Fixed	Simult. Gap N/S	Off	Yellow	1.5	0.0	1.5	2		0.0	-	ر" ["ر		- ^ ,	¥,
1 SICE WIDGE	1 IXEU	Sanut. Gap N/S	Oll	Itou	1.5	0.0	1.0		. <u> </u>	10.0		-	-		
Timer Results				EBI		EBT	WBI	L	WBT	NBI		NBT	SBI		SBT
Assigned Phase	e				\neg	4		\neg	8	5		2	1		6
Case Number						10.0			12.0	2.0		4.0	2.0		4.0
Phase Duration	hase Duration, s				\neg	23.3		\neg	10.1	11.4		34.0	6.9		29.5
Change Period,	hange Period, (Y+R c), s					5.5		\neg	5.5	5.0		5.5	5.0		5.5
Max Allow Head	dway (/	MAH), s			\neg	3.3		\neg	3.2	3.1	\neg	3.0	3.1	\neg	3.2
Queue Clearan	ce Time	(gs), S				16.8			2.6	6.8		9.8	2.6		21.8
Green Extensio					\neg	0.9		\neg	0.0	0.1	$\overline{}$	0.7	0.0		2.1
Phase Call Proi						1.00			0.46	0.91		1.00	0.26	5	1.00
Max Out Probal						0.00			0.00	0.01		0.08	0.00		0.00
Movement Gro	un Dae	ulte			EB			W	R		NB			SB	
Approach Move	_	uita		L	T	R	L	T		L	Т	R	L	T	R
Assigned Move				7	4	14	3	8	_	5	2	12	1	6	16
Adjusted Flow F		\ vob/b		117	359	14	16	-°	14	116	270	270	15	524	451
		ow Rate (s), veh/h/l	ln.	1767	1731		1788		1576	1767	1856	1851	1767	1856	1597
Queue Service				4.0	14.8		0.6		0.6	4.8	7.8	7.8	0.6	19.8	19.8
Cycle Queue C				4.0	14.8		0.6		0.6	4.8	7.8	7.8	0.6	19.8	19.8
Green Ratio (g		c ranc (gt), s		0.24	0.24		0.06		0.06	0.09	0.38	0.38	0.03	0.32	0.32
Capacity (c), v				424	415		112		99	151	713	711	44	600	516
Volume-to-Capa		tin (X)		0.275	0.865		0.141		0.144	0.766	0.379	0.380	0.335	0.873	0.872
		t/In (95 th percentile	1)	73	256		12		11	97	142	138	12	298	258
		eh/in (95 th percent		2.9	10.0		0.5		0.4	3.8	5.5	5.5	0.5	11.7	10.3
		RQ) (95 th percent		0.15	0.51		0.3		0.4	0.19	0.28	0.28	0.02	0.60	0.53
Uniform Delay (,	23.0	27.2		33.0		33.0	33.3	16.6	16.6	35.7	23.8	23.8
	ncremental Delay (d 2), s/veh						0.2		0.2	3.1	0.1	0.1	0.9	0.9	1.1
	nitial Queue Delay (d 3), s/veh						0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (23.2	0.0 29.4		33.3		33.3	36.4	16.7	16.7	36.7	24.7	24.9
Level of Service				С	С		С		С	D	В	В	D	С	С
Approach Delay				27.9	_	С	33.3		C	20.2		С	25.0		С
Intersection Del							1.3						С		
					EB			15.						0.5	
	ultimodal Results					_		W			NB	_		SB	_
	edestrian LOS Score / LOS					В	2.30	\rightarrow	В	1.90	-	В	2.10	-	В
Bicycle LOS Sc	cycle LOS Score / LOS					Α	0.51		Α	1.03	3	Α	1.20)	Α

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Table 107.Pennsylvania Ave and JFK Rd Saturday Noon-1PM HCS 5 Year Projection Conditions

						ersect									
General Inforn	nation								Intersec	tion Inf	ormatic	nn .	l k	المهادلة ا	Ja lu
Agency	ilation							\rightarrow	Duration.		1.000			411	
Analyst				Analys	is Dat	e 5/1/20	124	\rightarrow	Area Typ		Other				
Jurisdiction				Time F		0/1/20	724	\rightarrow	PHF		1.00		→ +		F.
Urban Street		JFK Rd		Analys		r 2024		_	Analysis	Derind	1> 7:0	20	-{ -2		٠,
Intersection		JI K Ku		File Na		$\overline{}$	er Denr		pdate 12		127.	50	-		
Project Descrip	tion			T IIC IV	anic	VVack	ci_rciii	i Jyi U	puate 12	-1.Xu5			- 4	4 1 4 7	\$ P
r roject Descrip	, cion														
Demand Inforr	mation				EB			WE	3		NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Demand (v), v	/eh/h			193	181	176	105	141	1 86	147	776	82	107	721	14
Signal Informa	ation				7				_ 2	1 3	₽.		L I		Ą
Cycle, s	71.5	Reference Phase	2		5	50	z §↑	25	R	R	E) '	2		K
Offset, s	0	Reference Point	End	Green	6.2	0.4	20.6	6.1	2.0	15.4	1				
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	-	0.0	4.0	4.0	0.0	4.0		>	Φ		- ♦
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		5	6	7	Y
Times December						EDT			MET			NDT	0.5		OPT
Timer Results	^			EBI	-	EBT 8	WB 7	L	WBT	NBI	-	NBT 6	SBI	-	SBT
Assigned Phas	e			3	+		_	-	4	1	_		5	_	2
Case Number				1.1		4.0	1.1	$\overline{}$	3.0	1.1	-	4.0	1.1	-	4.0
Phase Duration	nge Period, (Y+R o), s			13.4	-	22.7	11.3	-	20.6	11.7	-	26.1	11.4	-	25.7
		,-		5.2	+	5.2	5.2	-	5.2	5.2	-	5.1	5.2	_	5.1
Max Allow Hea				3.1	+	3.2	3.1	-	3.2	3.1	\rightarrow	3.1	3.1	$\overline{}$	3.1
Queue Clearan				7.9	+	16.3	5.2	-	6.6	5.7	_	16.1	4.9	_	18.2
Green Extension		(g e), S		0.3	-	1.1	0.1	-	1.2	0.2	\rightarrow	3.5	0.1	-	2.4
Phase Call Pro				1.00	-	1.00	0.88	-	1.00	0.93	-	1.00	0.88	-	1.00
Max Out Proba	DIIITY			0.00)	0.00	0.00)	0.00	0.00)	0.01	0.00)	0.49
Movement Gro	oup Res	sults			EB			WB			NB			SB	
Approach Move				L	Т	T R	L	Т	l R	L	Т	R	L	Т	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow I), veh/h		193	357	1	105	141	86	137	405	392	107	447	42
		ow Rate (s), veh/h/l	ln	1767	1704		1767	1856	_	1767	1856	1793	1767	1856	174
Queue Service				5.9	14.3		3.2	4.6	3.2	3.7	14.1	14.1	2.9	16.2	16.
		e Time ($g \circ$), s		5.9	14.3		3.2	4.6	3.2	3.7	14.1	14.1	2.9	16.2	16.
Green Ratio (g				0.33	0.24		0.30	0.22	0.22	0.38	0.29	0.29	0.38	0.29	0.2
Capacity (c), v				492	417		270	401	340	302	545	527	299	536	504
Volume-to-Cap		atio (X)		0.393	0.856		0.389	0.352	0.253	0.452	0.743	0.744	0.357	0.835	0.83
		t/ln (95 th percentile	:)	102	243		56	89	53	64	241	230	50	309	29
		eh/In (95 th percenti		4.0	9.5		2.2	3.5	2.1	2.5	9.4	9.2	1.9	12.1	11.
	· /·	RQ) (95 th percent		0.56	0.00		0.49	0.00		0.64	0.00	0.00	0.41	0.00	0.0
Uniform Delay				18.2	25.8		20.1	23.8		17.2	22.8	22.8	16.9	23.9	23.
Incremental De				0.2	2.0		0.3	0.2	0.1	0.3	0.7	0.7	0.3	7.1	7.6
Initial Queue De		,		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (18.4	27.9		20.4	24.0	_	17.6	23.5	23.5	17.2	31.0	31.
Level of Service				В	С		С	С	С	В	С	С	В	С	С
Approach Dela				24.5		С	22.7		С	22.6		С	29.7		С
Intersection De	•						5.5						С		
Multimodal Re	sults				EB			WB			NB			SB	
Pedestrian LOS	S Score	/LOS		2.28	3	В	2.28	3	В	2.10		В	1.91	1	В
Bicycle LOS So	ore / LO	OS		1.40) [Α	1.04	1	Α	1.32	2	Α	1.29)	Α

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Table 108.Pennsylvania Ave and JFK Rd Saturday Noon-1PM HCS 5 Year Projection Conditions Optimized

		HCS	Sigr	nalize	d Int	ersec	tion R	esul	ts Sun	nmary	,				
														Caller	
General Inform	nation							_	Intersec	tion Inf	_		- i	43.4	10000
Agency									Duration	, h	1.000				
Analyst				Analys	sis Dat	te 5/1/2	024		Area Typ	e	Other		4		
Jurisdiction				Time F	eriod				PHF		1.00		2 4	**	*
Urban Street		JFK Rd		Analys	sis Yea	ır 2024			Analysis	Period	1> 7:0	00	7		
Intersection				File Na	ame	Wack	cer_Pen	n 5yr L	Jpdate 12	-1(Ove	rall Dela	ay).xus		512	
Project Descrip	tion												1	MATAM	1-11
Damend Inform	4:							147	_		ND			CD.	
Demand Inform					EB	_	+	WI		-	NB		-	SB	_
Approach Move				L	T	R	L	T	_	L	T	R	L	T	R
Demand (v), v	eh/h			193	181	176	105	14	1 86	147	776	82	107	721	14
Signal Informa	tion				ΤŪ						R.				
Cycle, s	73.5	Reference Phase	2	1	1 2				4	R	ş •	\ 4	<u> </u>	∠	7
Offset, s	112	Reference Point	End		1	51						1	2	3	
Uncoordinated		Simult. Gap E/W	On	Green		0.4	22.0			17.3	<u> </u>			_	
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	1.2	0.0	4.0 1.1	1.2		1.2		X	Y	7	➾
i orce wrode	rixed	Simult. Gap N/S	Oll	Reu	11.4	10.0	1.1	1.2	10.0	1.2		3		,	
Timer Results				EBI		EBT	WE	L	WBT	NBI		NBT	SBI		SBT
Assigned Phase	е			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	1, S			12.2	2	23.3	11.	4	22.5	11.8	3	27.4	11.4	1	27.1
Change Period,	, (Y+R	c), S		5.2		5.2	5.2	2	5.2	5.2		5.1	5.2		5.1
Max Allow Head	ax Allow Headway (<i>MAH</i>), s			3.1		3.2	3.1		3.2	3.1		3.1	3.1		3.1
Queue Clearan	ueue Clearance Time (g s), s			8.1		16.8	5.2	2	6.6	5.8		16.4	4.9		18.4
Green Extensio	reen Extension Time ($g z$), s			0.0		1.2	0.2	2	1.2	0.2		3.6	0.0		3.4
Phase Call Proi	bability			1.00)	1.00	0.8	8	1.00	0.94	1	1.00	0.89)	1.00
Max Out Probal	bility			1.00)	0.00	0.0	0	0.00	0.00		0.00	1.00)	0.05
Movement Gro	un Dos	ulto			EB		_	WB			NB			SB	
	_	suits		L	T	T R		T	R	L	T	R		T	R
Approach Move Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
		\				10	_	-		_		391		<u> </u>	-
Adjusted Flow F		••		193	357		105	141		136	405		107	447	42
Queue Service		ow Rate (s), veh/h/l	11	1767 6.1	1704	-	1767 3.2	1856	3.3	1767 3.8	1856	1793	1767 2.9	1856 16.4	174
Cycle Queue C				6.1	14.8	-	3.2	4.6	3.3	3.8	14.3	14.4	2.9	16.4	16.4
Green Ratio (g		c fille (gr), s		0.33	0.25	-	0.32	0.23		0.39	0.30	0.30	0.39	0.30	0.3
				484	420		268	438	_	305	565	546	305	556	52
Capacity (c), v Volume-to-Capa		tio (Y)		0.399	0.850		0.392	_		0.447	0.716	0.717	0.351	0.804	_
		t/In (95 th percentile	1	107	250		57	89	53	65	244	232	51	283	26
		<u> </u>		4.2	9.7		2.2	3.5	2.1	2.5	9.5	9.3	2.0	11.1	10.
	ack of Queue (Q), veh/ln (95 th percentile) ueue Storage Ratio (RQ) (95 th percentile)			0.59	0.00		0.49	0.00	_	0.65	0.00	0.00	0.42	0.00	0.0
	niform Delay (d 1), s/veh			18.7	26.5	_	20.0	23.3		17.2	22.9	22.9	16.9	23.9	23.
	cremental Delay (d 2), s/veh			0.2	1.9	-	0.3	0.2	-	0.3	0.6	0.6	0.3	1.1	1.1
	itial Queue Delay (d 3), s/veh			0.0	0.0	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
	ontrol Delay (d), s/veh			18.9	28.5	-	20.4	23.5		17.6	23.4	23.4	17.2	24.9	25.
Level of Service	evel of Service (LOS)				С		С	С	С	В	С	С	В	С	С
Approach Delay				25.1		С	22.	4	С	22.6	6	С	24.1	1	С
Intersection Del						2	3.6						С		
Multimodal Re	sults				EB			WB			NB			SB	
Pedestrian LOS	Score	/ LOS		2.28	3	В	2.2	8	В	2.10		В	1.91	1	В
Bicycle LOS Sc	ore / LO)S		1.40)	Α	1.0	4	Α	1.32	2	Α	1.29)	Α

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Table 109.Pennsylvania Ave and JFK Rd Saturday Noon-1PM HCS 10 Year Projection Conditions

		HCS	Sigr	ialize	a inte	ersect	ion R	esul	ts Sun	ımary					
General Inform	antion.								Interne	tion Inf			1 8	4 사하1	L U
	nation							\rightarrow	Intersec		_		ı ı	411	
Agency				A m = b	in D-1	- E/4/01	22.4	\rightarrow	Duration,		1.000				
Analyst						5/1/20)24	\rightarrow	Area Typ	e	Other				٠,
Jurisdiction		.= = .		Time F				\rightarrow	PHF		1.00		-		Ē
Urban Street		JFK Rd		-	sis Yea	\rightarrow	_	_	Analysis		1> 7:	00	5		<u>_</u>
Intersection				File Na	ame	Wack	er_Penr	10yr	Update 1	2-1.xus				ጎተት	
Project Descrip	tion												-	4147	PIN
Demand Inforr	nation				EB			WI	3		NB			SB	
Approach Move	ement			L	Т	R	Ī	ΤT	R	L	T	R	L	Т	F
Demand (v), v	eh/h			203	190	184	110	14	8 91	155	815	86	113	758	15
Signal Informa			_		6			2		3	₽.			,	Ð
Cycle, s	74.5	Reference Phase	2		15	51	Z S:∩	2	"B		6] 1 -1	2	3	K
Offset, s	0	Reference Point	End	Green	6.3	0.3	22.0	6.3	_	16.4	1				
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	-	0.0	4.0	4.0	-	4.0		Y	Φ	_	- ⇔
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		5	6	7	Z
Times Beaute				ED!		CDT	14/0		MDT	NE		NDT	0.01		CDT
Timer Results Assigned Phase	Δ			EBI 3	-	EBT 8	WB 7	L	WBT 4	NBI 1	-	NBT 6	SBI 5	-	SBT 2
Case Number	<u> </u>			1.1	_	4.0	1.1	+	3.0	1,1		4.0	1.1		4.0
Phase Duration				13.9	, +	24.1	11.5	-	21.6	11.8		27.4	11.5	-	27.1
Change Period		-) c		5.2	-	5.2	5.2	-	5.2	5.2	$\overline{}$	5.1	5.2	-	5.1
	ax Allow Headway (MAH), s			3.1	_	3.2	3.1	-	3.2	3.1	_	3.1	3.1	_	3.1
				8.4	_	17.7	5.4	\rightarrow	7.0	6.1	\rightarrow	17.5	5.2	$\overline{}$	19.8
	eue Clearance Time ($g \circ$), s een Extension Time ($g \circ$), s			0.4	-	1.2	0.1	-	1.2	0.1	_	3.8	0.1	_	2.1
Phase Call Pro		(g e), s		1.00	-	1.00	0.90	\rightarrow	1.00	0.95	\rightarrow	1.00	0.90	-	1.00
Max Out Proba				0.00	-	0.00	0.00	_	0.00	0.00	_	0.01	0.00	_	0.69
max out 1 loou	Dinity .			0.00		0.00	0.00		0.00	0.00		0.01	0.00		0.00
Movement Gro	up Res	ults			EB			WB			NB			SB	
Approach Move	ement			L	Т	R	L	T	R	L	T	R	L	Т	R
Assigned Move	ment			3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow F	Rate (v), veh/h		203	374		110	148	91	143	424	410	113	470	44
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1767	1705		1767	1856	1572	1767	1856	1793	1767	1856	174
Queue Service	Time (g	g s), S		6.4	15.7		3.4	5.0	3.6	4.1	15.5	15.5	3.2	17.8	17.
Cycle Queue C	learanc	e Time (<i>g</i> _c), s		6.4	15.7		3.4	5.0	3.6	4.1	15.5	15.5	3.2	17.8	17.
Green Ratio (g	/C)			0.34	0.25		0.31	0.22	0.22	0.39	0.30	0.30	0.38	0.30	0.3
Capacity (c), v	/eh/h			493	432		263	409	347	288	557	538	290	549	51
Volume-to-Cap	acity Ra	tio (X)		0.412	0.866		0.419	0.362	0.263	0.497	0.761	0.762	0.390	0.857	0.8
Back of Queue	(Q), fl	l/In (95 th percentile	:)	113	263		62	98	58	71	261	248	55	351	32
Back of Queue	(Q), ve	eh/In (95 th percenti	ile)	4.4	10.3		2.4	3.8	2.3	2.8	10.2	9.9	2.1	13.7	13
Queue Storage	Ratio (RQ) (95 th percent	tile)	0.62	0.00		0.54	0.00	0.51	0.71	0.00	0.00	0.46	0.00	0.0
Uniform Delay ((d 1), S	/veh		18.7	26.6		20.9	24.6	24.1	18.1	23.7	23.7	17.7	24.8	24.
Incremental De	cremental Delay (d 2), s/veh			0.2	2.1		0.4	0.2	0.1	0.4	0.7	0.7	0.3	10.4	11.
Initial Queue De	itial Queue Delay (d 3), s/veh			0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/ve	eh		18.9	28.8		21.3	24.8	24.2	18.5	24.4	24.4	18.0	35.2	35.
Level of Service	e (LOS)			В	С		С	С	С	В	С	С	В	D	D
Approach Delay	y, s/veh	/LOS		25.3	3	С	23.6	5 T	С	23.6	6	С	33.6	6	С
Intersection De	lay, s/ve	h / LOS				2	7.4						С		
								,							
Multimodal Re				2.5	EB			WB		0.00	NB		1.5	SB	
	destrian LOS Score / LOS			2.28	. I	В	2.28	2 I	В	2.10	1 I	В	1.91	1 1	В

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Table 110.Pennsylvania Ave and JFK Rd Saturday Noon-1PM HCS 10 Year Projection Conditions Optimized

		пС	o sigr	ialize	u inte	ersect	ion K	esuli	ts Sun	ımary					
General Inform	ation								Intersec	tion Infe	ormatic	nn.		4.501	яŲ
	iation							\rightarrow	Duration.		1.000		- B	417	
Agency Analyst				Analys	ie Date	5/1/20	124	\rightarrow	Area Typ		Other				
				Time F		3/1/20	124	\rightarrow	PHF	<u> </u>	1.00			ä.	<u>'</u> -
Jurisdiction		IEK D4				2024		_		Daniad	-	20	- 5 -		•
Urban Street		JFK Rd		_		2024		_	Analysis		1> 7:0		- 1		
Intersection				File Na	ame	Wack	er_Penr	10yr	Update 1	2-1(Ove	erall De	lay).xus		1.1	
Project Descrip	tion													41970	RIN.
Demand Inform	nation				EB			WE	3		NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Тт	R
Demand (v), v				203	190	184	110	_	_	155	815	_	113	758	155
20										100					
Signal Informa	tion				7		25			1 2	<u> </u>			_	A
Cycle, s	78.1	Reference Phase	2		7	150	2 SA	2Ľ	Æ	ĸ	è	\ ⁴	, <u> </u>	∠ ∫	Z
Offset, s	111	Reference Point	End	Green	6.4	0.3	24.4	6.4	2.8	17.1		1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	-	0.0	4.0	4.0	0.0	4.0			Stz		7
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		- 6	0	7	4
Timer Results				EBI	-	EBT	WB	L	WBT	NBI	-	NBT	SBI	L	SBT
Assigned Phase	е			3	_	8	7		4	1		6	5		2
Case Number				1.1	_	4.0	1.1	_	3.0	1.1	_	4.0	1.1		4.0
Phase Duration	, s			14.4	-	25.1	11.6	-	22.3	11.9		29.8	11.6	-	29.5
Change Period,		••		5.2 3.1	_	5.2	5.2	-	5.2	5.2		5.1	5.2	-	5.1
	ax Allow Headway (MAH), s					3.2	3.1	-	3.2	3.1		3.1	3.1	-	3.1
	ueue Clearance Time (g s), s					18.4	5.6	-	7.3	6.2		18.0	5.2		20.3
Green Extensio	reen Extension Time (g e), s					1.2	0.2		1.2	0.2		3.8	0.1		3.8
Phase Call Prol	bability			1.00		1.00	0.91	1	1.00	0.96		1.00	0.92	2	1.00
Max Out Proba	bility			0.00		0.00	0.00		0.00	0.00		0.02	0.04	<u> </u>	0.02
Movement Gro	un Das	ulte			EB			WB			NB			SB	
Approach Move	_	suita		L	T	R	L	Т	R	L	Т	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
		\ vah/h		203	374	10	110	148	91	144	426	412	113	470	443
Adjusted Flow F		••	_			-	_	_	_					_	
		ow Rate (s), veh/h/l		1767	1705		1767	1856	-	1767	1856	1793	1767	1856	1746
Queue Service				6.8	16.4 16.4		3.6	5.3	3.8	4.2	16.0 16.0	16.0 16.0	3.2	18.3	18.3
Cycle Queue C Green Ratio (g		e nine (gc), s		0.34	0.25		0.30	0.22	_	0.40	0.32	0.32	0.40	0.31	0.31
				492	437		259	407	345	292	588	568	295	581	547
Capacity (c), v		tio (V)					_								-
Volume-to-Capa			١	0.413	0.857		0.424	0.364	0.264	0.493	0.724	0.725	0.383	0.810	0.81
		t/In (95 th percentile		121	274		67	104		74	270	257	57	313	
		eh/ln (95 th percenti		4.7	10.7		2.6	4.1	2.4	2.9	10.5	10.3	0.47	12.2	11.6
		RQ) (95 th percent	ne)	0.66			0.58		_	0.73	0.00	0.00 23.8		0.00	24.9
Uniform Delay (Incremental De				19.7 0.2	27.9		0.4	26.0 0.2	25.4 0.2	18.2 0.4	0.6	0.6	17.7 0.3	24.8	1.1
Initial Queue De				0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (19.9	29.8		22.6	26.2	-	18.7	24.4	24.4	18.0	25.9	26.0
Level of Service				B	C C		C	C C	C	В	C	C C	B	C C	C
Approach Delay				26.3		С	24.9		C	23.5	_	С	25.1		-
Intersection Delay				20.3			24.3 4.8	,	U	23.5			C		-
micraection De	ay, arve	/ 200				2.									
Multimodal Re	sults				EB			WB			NB			SB	
		/LOS		2.28		В	2.28	3	В	2.10		В	1.91		В
i odooman coc	destrian LOS Score / LOS ycle LOS Score / LOS														

Table 111.Pennsylvania Ave and JFK Rd Saturday Noon-1PM HCS 20 Year Projection Conditions

		HCS	Sigr	nalize	d Int	ersect	ion R	esul	lts Sun	nmary	,				
										,					
General Inform	nation								Intersec	tion Inf	ormatio	on	, i	14741	
Agency									Duration,	, h	1.000	1		411	
Analyst				Analys	sis Dat	te 5/1/20	024		Area Typ	е	Other		±, →		· -
Jurisdiction				Time F	Period				PHF		1.00		÷		<u> </u>
Urban Street		JFK Rd		Analys	sis Yea	ar 2024			Analysis	Period	1> 7:0	00	4		
Intersection				File Na	ame	Wack	er_Penr	ı 20yr	Update 1	2-1.xus				ጎተት	
Project Descrip	otion												7	4144	Þſſ
Demand Infor	mation				EB			W	B		NB			SB	
Approach Move				L	Τ	R	1	Т Т	_	1	T	R	1	T	R
Demand (v), v				225	210	\rightarrow	122	-	\rightarrow	171	901	95	124	837	171
Signal Informa	1							1 2	a	3	₹ .				→
Cycle, s	80.8	Reference Phase	2		5	151	z §↑	25	R	R	E	1 1	2	3	K
Offset, s	0	Reference Point	End	Green	6.6	0.3	24.6	6.6	3.4	18.7	,	•			
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	-	0.0	4.0	4.0		4.0	_ `	>	Φ	<u></u>	- ♦.
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	2 0.0	1.2	_	5	6	7	7
Timer Results				EBI		EBT	WB	1	WBT	NBI	$\overline{}$	NBT	SBI		SBT
Assigned Phas				3		8	7	-	4	1		6	5		2
Case Number				1.1	\rightarrow	4.0	1.1	\rightarrow	3.0	1.1		4.0	1.1		4.0
Phase Duration	1 S			15.1	-	27.3	11.8	\rightarrow	23.9	12.1		30.0	11.8	-	29.7
Change Period		c). S		5.2	-	5.2	5.2	\rightarrow	5.2	5.2	-	5.1	5.2	-	5.1
	x Allow Headway (MAH), s			3.1	-	3.2	3.1	\rightarrow	3.2	3.1	\neg	3.1	3.1	_	3.1
	x Allow Headway (<i>MAH</i>), s eue Clearance Time (<i>g</i> ₅), s			9.6	\rightarrow	20.9	6.1	\rightarrow	8.0	6.8		20.5	5.8	-	23.9
Green Extension				0.3	-	1.2	0.2	-	1.4	0.3	-	4.3	0.2	_	0.7
Phase Call Pro		(3 //		1.00		1.00	0.94	4	1.00	0.97	,	1.00	0.94	1	1.00
Max Out Proba				0.00	-	0.02	0.00	-	0.00	0.00	-	0.04	0.00	-	1.00
								14/5			NID			0.0	
Movement Gro		suits			EB	T 5		WE	_		NB			SB	
Approach Mov				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow		**	_	225	414	-	122	164		156	461	446	124	519	489
		ow Rate (s), veh/h/l	П	1767	1704	_	1767	1856	_	1767	1856	1793	1767	1856	1746
Queue Service				7.6	18.9	-	4.1	6.0	_	4.8	18.5	18.5	3.8	21.9	21.9
-		e Time (<i>g</i> _o), s		7.6	18.9	_	4.1	6.0	_	4.8	18.5	18.5	3.8	21.9	21.9
Green Ratio (g	<u> </u>			0.36	0.27		0.31	0.23	_	0.39	0.31	0.31	0.39	0.30	0.30
Capacity (c),		atio (V)		498	467	7	248	431	_	257	571	552	266	565	531
Volume-to-Cap			١	0.452	0.887	-	0.491	0.38		0.605	0.807	0.807	0.467	0.920	0.920
		t/In (95 th percentile eh/In (95 th percenti	,	136	12.0	-	76	118	_	86	308	293	67	487	458
				5.3 0.75	12.9 0.00	-	3.0 0.66	0.00	$\overline{}$	3.3 0.86	0.00	0.00	2.6 0.56	19.0	18.3
	ueue Storage Ratio (RQ) (95 th percentile) niform Delay (d 1), s/veh			19.4	28.2	_	22.6	26.2	_	20.1	25.8	25.8	19.6	27.2	27.2
	cremental Delay (d 2), s/veh			0.2	7.5	-	0.6	0.2	_	0.7	0.9	0.9	0.5	25.7	27.1
	itial Queue Delay (d 3), s/veh			0.0	0.0		0.0	0.0	_	0.0	0.0	0.0	0.0	0.0	0.0
	ontrol Delay (d), s/veh			19.7	35.6		23.2	26.4	_	20.9	26.7	26.7	20.1	52.9	54.3
Level of Servic	. ,,			В	D		C	C	C	C	C	C	C	D	D
Approach Dela				30.0		С	25.2		С	25.9		С	49.9		D
Intersection De	_						5.1						D		
Multimodal Re					EB			WE			NB			SB	
Pedestrian LOS				2.28	-	В	2.28	-	В	2.11	-	В	1.92	-	В
Bicycle LOS So	core / LC	OS		1.54	1	В	1.12	2	Α	1.45	5	Α	1.42	2	Α

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Table 112.Pennsylvania Ave and JFK Rd Saturday Noon-1PM HCS 20 Year Projection Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	ion R	esult	ts Sum	ımary					
General Inform	nation								Intersect	tion Inf	ormatic	nn.		4241	έŲ
	iauon							_	Duration.		1.000			न्रा	
Agency				Anahus	io Dote	EIIDI	224	-			-		- 7		
Analyst						5/1/20	J24	-	Area Typ	e	Other		- 1		-
Jurisdiction		IEI/ D. I		Time F		2004		_	PHF		1.00		1		-
Urban Street		JFK Rd			sis Year	-			Analysis		1> 7:0		- 5		
Intersection				File Na	ame	Wack	er_Penr	1 20yr	Update 1	2-1(Ov	erall De	lay).xus		<u>111</u>	
Project Descrip	tion													4147	ĦĬ
Demand Inforr	nation				EB			WE	3		NB			SB	
Approach Move	ement			L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), v	eh/h			225	210	204	122	164	4 100	171	901	95	124	837	171
Signal Informa	ntion							_			5				
Cycle, s	89.8	Reference Phase	2	1	1 2			_ -	43	R	£ .	\ 4		.	♦
Offset, s	92	Reference Point	End		1	<u></u>			- 5			1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Green		0.7	30.3	6.7	4.3	20.3	<u> </u>		-4-	_	_
Force Mode	Fixed	Simult. Gap N/S	On	Yellow Red	1.2	0.0	4.0	4.0 1.2	0.0	1.2		6	Y	7	↔
T GIGG WIGGG	Tixou	Olimaia: Oup 1470		1100	11.2	0.0	11.1	1.2	0.0	11.2					
Timer Results				EBI	L	EBT	WB	L	WBT	NBI	-	NBT	SBI	-	SBT
Assigned Phase	е			3		8	7	\perp	4	1		6	5		2
Case Number				1.1		4.0	1.1		3.0	1.1		4.0	1.1		4.0
Phase Duration	1, S			16.3	3	29.8	11.9)	25.5	12.6	6	36.1	11.9	9	35.4
Change Period	, (Y+R	ε), S		5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Hea	dway (/	MAH), s		3.1	$\neg \vdash$	3.2	3.1	$\neg \vdash$	3.2	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	e (gs), S		10.5	5	23.2	6.7		8.8	7.1		21.8	6.0		25.4
Green Extension	n Time	(ge), S		0.4		0.9	0.0		1.2	0.3		4.3	0.2		4.3
Phase Call Pro	bability			1.00		1.00	0.95	5	1.00	0.98	3	1.00	0.96	3	1.00
Max Out Proba	bility			0.00		0.00	1.00		0.04	0.00)	0.04	0.00		0.03
Movement Gro	nun Res	ults			EB			WB			NB			SB	
Approach Move		ruito		L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow I) voh/h		225	414	10	122	164	100	156	463	448	124	519	489
		•	n		1704	-		1856		1767	1856	1793	1767	1856	
Queue Service		ow Rate (s), veh/h/l		1767 8.5	21.2		1767 4.7	6.8	1572 4.8	5.1	19.8	19.8	4.0	23.4	23.4
Cycle Queue C				8.5	21.2		4.7	6.8	4.8	5.1	19.8	19.8	4.0	23.4	23.4
Green Ratio (g		Chine (yt), s		0.37	0.27		0.31	0.23		0.43	0.35	0.35	0.42	0.34	0.34
Capacity (c), v				488	470		231	421	357	270	645	624	278	630	592
Volume-to-Cap		tio (V)		0.462	0.881		0.528	0.389		0.579	0.718		0.446	0.825	
		t/In (95 th percentile)	155	344		90	138	82	93	327	310	73	389	362
		eh/In (95 th percenti		6.1	13.4		3.5	5.4	3.2	3.6	12.8	12.4	2.9	15.2	14.5
		RQ) (95 th percent		0.85	0.00		0.78	0.00		0.93	0.00	0.00	0.61	0.00	0.00
Uniform Delay				21.5	31.6		26.1	29.9	_	20.9	25.8	25.8	19.8	27.6	27.6
Incremental De				0.3	2.2		0.7	0.2	0.2	0.6	0.5	0.5	0.4	1.1	1.2
Initial Queue De	elay (d	з), s/veh		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (21.7	33.8		26.8	30.1	29.2	21.5	26.3	26.3	20.2	28.7	28.8
Level of Service				С	С		С	С	С	С	С	С	С	С	С
Approach Delay	y, s/veh	/LOS		29.6	ò	С	28.8	3	С	25.6	ò	С	27.8	3	С
Intersection De	lay, s/ve	h/LOS				2	7.6						С		
Multimodal Do	ltimodal Results				ED			MP			NID			QD.	
Multimodal Re		/108		2.28	EB	В	2.29	WB	В	2.11	NB	В	1.92	SB	В

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Table 113.Wacker Dr and JFK Rd Saturday Noon-1PM HCS 5 Year Projection Conditions

		HCS	Sigr	alize	d Inte	ersect	ion R	esu	Its Su	um	mary					
General Inforn	nation											ormatic		- i	411	pa lu
Agency						1			Durati			1.000				
Analyst						e 5/1/20	24		Area T	Гуре	е	Other		- -		
Jurisdiction				Time F					PHF			1.00		*		*
Urban Street		JFK Rd		Analys	sis Yea	r 2024		_	Analys			1> 7:0	00	7		
Intersection		JFK/Wacker		File Na	ame	Wack	er_Penn	5yr	Update	12-	-1.xus				<u> ጎተት</u>	
Project Descrip	tion		_	_	_	_	_		_		_	_	_		4144	P I'I
Demand Inform	mation				EB			V	/B			NB			SB	
Approach Move					Τ	T R	1	_		R	1	T	R	1	Τ	R
Demand (v), v				446	12	69	20	-	_	24	165	542	5	14	474	387
Demand (V), V	CHIT			440	12	03	20		2		100	042		14	4/4	001
Signal Informa	ition				Ţ	\top	121	Т	5		\top					
Cycle, s	81.4	Reference Phase	2	1	R	54		"Ľ	7				∠	1	-	↔
Offset, s	0	Reference Point	End	Green	21	2.2	26.5	14	6.9 7.	.2	0.0		1	2	3	<u> </u>
Uncoordinated	Yes	Simult. Gap E/W	Off	Yellow	-	3.5	4.0	3.		.0	0.0	-			7	→
Force Mode	Fixed	Simult. Gap N/S	Off	Red	1.5	1.5	1.5	2.		.5	0.0		5	6	7	
Timer Results				EBI	-	EBT	WBI	L	WBT		NBI	-	NBT	SBL	-	SBT
Assigned Phas	е					4			8	_	5		2	1		6
Case Number						10.0		_	12.0	_	2.0		4.0	2.0		4.0
Phase Duration	1, S					22.4			12.7	_	14.4	1 :	39.2	7.1		32.0
Change Period	, (Y+R	c), S				5.5			5.5	_	5.0		5.5	5.0		5.5
Max Allow Hea	dway (I	MAH), s				3.2		\perp	3.2	_	3.1		3.0	3.1		3.2
Queue Clearan	ce Time	e (gs), s				15.8			3.3	_	9.4		10.3	2.7		24.2
Green Extension	n Time	(ge), S				1.0			0.0	_	0.1		1.0	0.0		2.2
Phase Call Pro	bability					1.00		\Box	1.00	_	0.98	3	1.00	0.30		1.00
Max Out Proba	bility					0.00			0.00	_	0.07	<u> </u>	0.00	0.00		0.00
Movement Gro	oup Res	sults			EB			W	B	╗		NB			SB	
Approach Move	•			L	T	R		T	R	_	L	T	R	L	T	R
Assigned Move				7	4	14	3	8	18	7	5	2	12	1	6	16
Adjusted Flow), veh/h		223	304		30		26	7	165	274	273	16	533	453
		ow Rate (s), veh/h/l	n	1767	1725		1795		159	95	1767	1856	1849	1767	1856	1578
Queue Service				9.3	13.8		1.2		1.3	3	7.4	8.3	8.3	0.7	22.2	22.2
		e Time (<i>g</i> _o), s		9.3	13.8		1.2		1.3	3	7.4	8.3	8.3	0.7	22.2	22.2
Green Ratio (g				0.21	0.21		0.09		0.0	9	0.12	0.41	0.41	0.03	0.33	0.33
Capacity (c), v	/eh/h			367	358		159		14	1	204	769	766	47	604	513
Volume-to-Cap	acity Ra	atio (X)		0.608	0.849		0.186		0.18	88	0.810	0.356	0.357	0.344	0.883	0.883
Back of Queue	(Q), fl	t/ln (95 th percentile)	178	246		24		22	2	151	152	148	15	328	280
Back of Queue	(Q), ve	eh/ln (95 th percenti	le)	6.9	9.6		1.0		0.9	9	5.9	5.9	5.9	0.6	12.8	11.2
Queue Storage	Ratio (RQ) (95 th percent	ile)	0.36	0.49		0.55		0.4	9	0.30	0.30	0.30	0.03	0.66	0.57
Uniform Delay				29.3	31.1		34.5		34.	5	35.2	16.4	16.4	39.0	26.1	26.1
Incremental De	lay (d 2), s/veh		0.6	2.3		0.2		0.2	2	3.5	0.1	0.1	0.8	0.9	1.1
Initial Queue D	elay (d	з), s/veh		0.0	0.0		0.0		0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/ve	eh		29.9	33.4		34.7		34.	7	38.8	16.5	16.5	39.9	27.0	27.1
Level of Service	e (LOS)			С	С		С		С		D	В	В	D	С	С
Approach Dela				31.9		С	34.7		С	7	21.7	·	С	27.3	3	С
Intersection De						26	6.8							С		
Multimodal Re					EB			W		4		NB			SB	
Pedestrian LOS				2.30	-	В	2.31	\rightarrow	В	_	1.90	$\overline{}$	В	2.11	-	В
Bicycle LOS So	core / LC	OS		1.36	6	Α	0.53	3	Α		1.08	3	Α	1.21		Α

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Table 114.Wacker Dr and JFK Rd Saturday Noon-1PM HCS 5 Year Projection Conditions Optimized

											mary					
	4.														47.41	100
General Inforn	nation								-		ion Info	-		- 6	410	
Agency						F (1 1 2 2	24		Durat	-		1.000				
Analyst				<u> </u>		5/1/20	24		Area	Тур	•	Other				,
Jurisdiction				Time F		-			PHF			1.00		2 4	} ,	,
Urban Street		JFK Rd		Analys	is Year	2024			Analy	sis I	Period	1> 7:0	00	7		
Intersection		JFK/Wacker		File Na	ame	Wacke	er_Penn	5уг	Update	e 12-	-1(Over	all Dela	y).xus		712	
Project Descrip	tion													ħ	4 t o M	11.0
Demand Inforr	nation				EB			V	/B			NB			SB	
Approach Move				L	T	R	L	_	$\overline{}$	R	L	ΤT	R	L	T	T
Demand (v), v				446	12	69	20	-	-	24	165	542	5	14	474	38
Demand (v), v	en/n			440	12	09	20		2 .	24	103	342	3	14	4/4	30
Signal Informa	tion				Iζ	$\overline{}$	121	Т	5	_	$\overline{}$					
Cycle, s	81.3	Reference Phase	2	1	_ s	543		۽¥	7				∠	D	l l	➾
Offset, s	0	Reference Point	End		124	122		4		7.2	0.0		1	2	3	¥
Uncoordinated	Yes	Simult. Gap E/W	Off	Green Yellow		3.5	26.4 4.0	3.		7.2 3.0	0.0				7	- 0
Force Mode	Fixed	Simult. Gap N/S	Off	Red	1.5	1.5	1.5	2.		2.5	0.0		6	0	7	
Timer Results				EBI	-	EBT	WBI	L	WBT	ГΠ	NBL		NBT	SBL	-	SBT
Assigned Phase	е				\neg	4		\neg	8	\neg	5		2	1	\neg	6
Case Number						10.0			12.0		2.0		4.0	2.0		4.0
Phase Duration	, s				\neg	22.3		\neg	12.7	\neg	14.4		39.1	7.1	\neg	31.9
Change Period	(Y+R	ε), S				5.5			5.5		5.0		5.5	5.0		5.5
Max Allow Head	ax Allow Headway (MAH), s				\neg	3.2		\neg	3.2	\neg	3.1		3.0	3.1	-	3.2
						15.8		\rightarrow	3.3		9.4		10.3	2.7	-	24.1
	ueue Clearance Time ($g \epsilon$), s reen Extension Time ($g \epsilon$), s					1.0		\rightarrow	0.0	_	0.1		0.7	0.0	_	2.2
Phase Call Pro		(8-7,0				1.00			1.00		0.98		1.00	0.30	-	1.00
Max Out Proba					_	0.00		_	0.00	\rightarrow	0.02	_	0.06	0.00		0.00
Movement Gro	oup Res	sults			EB		<u> </u>	W		_		NB			SB	
Approach Move	ement			L	T	R	L		_	_	L	T	R	L	T	R
Assigned Move	ment			7	4	14	3	8	1	8	5	2	12	1	6	16
Adjusted Flow I	Rate (v), veh/h		223	304		30		2	6	165	274	273	16	533	45
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1767	1725		1795		15	95	1767	1856	1849	1767	1856	15
Queue Service	Time (g	g s), S		9.3	13.8		1.2		1.	3	7.4	8.3	8.3	0.7	22.1	22
Cycle Queue C	learanc	e Time (gε), s		9.3	13.8		1.2		1.	3	7.4	8.3	8.3	0.7	22.1	22
Green Ratio (g	/C)			0.21	0.21		0.09		0.0	09	0.12	0.41	0.41	0.03	0.32	0.3
Capacity (c), v	/eh/h			366	357		159		14	11	204	768	766	47	603	51
Volume-to-Cap	acity Ra	itio (X)		0.609	0.851		0.186		0.1	88	0.810	0.357	0.357	0.345	0.884	0.8
Back of Queue	(Q), fl	t/In (95 th percentile)	177	246		24		2	2	150	151	148	15	332	28
		eh/ln (95 th percenti		6.9	9.6		1.0		0.	9	5.8	5.9	5.9	0.6	13.0	11
Queue Storage	Ratio (RQ) (95 th percent	ile)	0.35	0.49		0.55		0.4	49	0.30	0.30	0.30	0.03	0.66	0.5
Uniform Delay				29.3	31.1		34.4		34	$\overline{}$	35.1	16.4	16.4	39.0	26.0	26
ncremental Delay (d 2), s/veh				0.6	2.3		0.2		0.	\rightarrow	3.0	0.1	0.1	0.9	1.0	1.
nitial Queue Delay (d 2), s/veh				0.0	0.0		0.0		0.	\neg	0.0	0.0	0.0	0.0	0.0	0.
Control Delay (•		29.9	33.3		34.6		34	$\overline{}$	38.1	16.5	16.5	39.8	27.0	27
Level of Service				C	C		С		, c	\neg	D	В	В	D	C	- C
Approach Delay				31.9		С	34.6		-		21.5		С	27.3		c
Intersection De				31.3			5.7				21.0			C 27.5		_
	, u															
Multimodal Re	sults				EB			W	В			NB			SB	
		/LOS		2.30	_	В	2.31	П	В		1.90		В	2.11	\top	В
	destrian LOS Score / LOS ycle LOS Score / LOS				5	Α	0.53	\rightarrow	Α		1.08	-	Α	1.21	-	Α

Table 115.Wacker Dr and JFK Rd Saturday Noon-1PM HCS 10 Year Projection Conditions

		HCS	3 Sigr	nalize	d Inte	ersect	ion R	esu	Its S	um	mary					
														1		
General Inform	nation								Inters	sect	ion Infe			- i	411	ja la
Agency									Durat	tion,	h	1.000			717	
Analyst						e 5/1/20)24		Area	Тур	е	Other				
Jurisdiction				Time F	Period				PHF			1.00		± +		÷
Urban Street		JFK Rd		Analys	is Yea	r 2024			Analy	sis l	Period	1> 7:0	00	7		
Intersection		JFK/Wacker		File Na	ame	Wack	er_Penr	10y	r Upda	te 1:	2-1.xus				ጎተት	
Project Descrip	tion													T	4144	1 4
	4:						_		ıp.			ND		_	0.0	
Demand Inforr					EB			_	/B	_		NB			SB	
Approach Move				L	T	R	L	-	_	R	L 170	T	R	L	T	R
Demand (v), v	en/h			468	13	76	21	1	2 :	25	173	570	6	14	498	40
Signal Informa	tion						TII	T	Б.		_	_				
Cycle, s	88.5	Reference Phase	2	1	2		- 24	_	Ħ					tz		7
Offset, s	0	Reference Point	End		5				i -				1	2	3	Δ
Uncoordinated	Yes	Simult. Gap E/W	Off	Green		3.2	29.8	_		7.6	0.0				,	4
Force Mode	Fixed	Simult. Gap E/W	Off	Yellow Red	1.5	3.5 1.5	1.5	3. 2.		3.0 2.5	0.0) [4	_	-	~
T OTCE WIDGE	TINEU	Gilluit. Gap 19/3	Oll	reu	1.0	1.0	1.0		· 2		10.0			-	-	
Timer Results				EBL	T	EBT	WB		WBT		NBI		NBT	SBI		SBT
Assigned Phase	ρ.			- 201		4	***	-	8		5		2	1		6
Case Number				_	-	10.0	_	\dashv	12.0		2.0	+	4.0	2.0	\rightarrow	4.0
Phase Duration				_	_	24.6	_	\dashv	13.1	-	15.5		43.5	7.3	_	35.3
		-) s		_	_	5.5		\dashv	5.5	-	5.0		5.5	5.0	-	5.5
	nange Period, (Y+R o), s ax Allow Headway (MAH), s			_	_	3.2	_	\dashv	3.2	-	3.1	_	3.0	3.1	_	3.2
	ax Allow Headway (<i>MAH</i>), s ueue Clearance Time (<i>g</i> s), s			_	_	18.0		\dashv	3.4	_	10.5		11.3	2.8	_	27.4
Green Extensio				_	_	1.0	_	\dashv	0.0	-	0.1	<u>'</u>	1.0	0.0	_	2.3
		(g e), s		_	_	1.00	_	\dashv	1.00		0.1		1.00	0.0	_	1.00
Phase Call Proba				_	-	0.01	_	\dashv	0.00	_	0.93	_	0.00	0.00		0.00
Max Out 1 10ba	Dility					0.01			0.00		0.22		0.00	0.00		0.00
Movement Gro	up Res	sults			EB			W	В	п		NB			SB	
Approach Move	ement			L	Т	R	L	Т	F	₹	L	Т	R	L	Т	R
Assigned Move	ment			7	4	14	3	8	18	8	5	2	12	1	6	16
Adjusted Flow F), veh/h		234	323		31		2	7	173	288	288	16	560	476
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1767	1723	1	1794		159	94	1767	1856	1849	1767	1856	1578
Queue Service				10.6	16.0		1.4		1.	4	8.5	9.3	9.3	0.8	25.4	25.4
		e Time ($g \circ$), s		10.6	16.0		1.4		1.	4	8.5	9.3	9.3	0.8	25.4	25.4
Green Ratio (g				0.22	0.22		0.09		0.0	09	0.12	0.43	0.43	0.03	0.34	0.34
Capacity (c), v				382	372		154		13	37	209	798	795	46	626	532
Volume-to-Cap		ntio (X)		0.613	0.868		0.198		0.2	00	0.826	0.362	0.362	0.350	0.895	0.89
		t/ln (95 th percentile	:)	202	291		28		2	5	188	173	168	16	370	315
		eh/ln (95 th percenti		7.9	11.4		1.1		1.	0	7.4	6.8	6.7	0.6	14.5	12.0
		RQ) (95 th percent		0.40	0.58		0.63		0.5	_	0.38	0.35	0.35	0.03	0.74	0.6
Uniform Delay (31.4	33.6		37.7		37	-	38.2	17.1	17.1	42.5	27.9	27.
	cremental Delay (d 2), s/veh			0.6	5.6		0.2		0.	_	8.9	0.1	0.1	0.8	0.9	1.1
	itial Queue Delay (d 3), s/veh			0.0	0.0		0.0		0.	_	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (32.0	39.1		37.9		38	.0	47.1	17.2	17.2	43.3	28.8	29.0
	evel of Service (LOS)			С	D		D			-	D	В	В	D	С	С
Approach Delay				36.2		D	37.9		D		24.1		С	29.1		С
Intersection De							9.4							С		
										أور						
Multimodal Re	sults				EB			W	В			NB			SB	
Pedestrian LOS	Score	/ LOS		2.30		В	2.31		В		1.90		В	2.11		В
Bicycle LOS Sc	ore / LC	os		1.41		Α	0.54		Α		1.11		Α	1.25	5	Α

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Table 116.Wacker Dr and JFK Rd Saturday Noon-1PM HCS 10 Year Projection Conditions Optimized

	нся	S Sigr	nalize	d Inte	ersect	ion R	esu	lts Sui	nmary	,				
General Information									ction Inf	_		- é	4941	> 1,
Agency								Duration	,	1.000		-		
Analyst			Analys	is Date	5/1/20	24		Area Ty	ре	Other	•	14		
Jurisdiction			Time F	Period				PHF		1.00		2 +	A.	· +
Urban Street	JFK Rd		Analys	sis Year	2024			Analysis	Period	1> 7:0	00	2		
Intersection	JFK/Wacker		File Na	ame	Wack	er_Penn	10y	r Update	12-1(Ov	erall De	lay).xus		3.4	
Project Description												T T	dien	21
Damand Information								(D		ND			CD.	
Demand Information				EB			_	VB		NB			SB	
Approach Movement			L	T	R	L	-	T R	L	T	R	L	T	R
Demand (v), veh/h			468	13	76	21		12 25	173	570	6	14	498	407
Signal Information						121	т	5_	\neg	П				
Cycle, s 89.9	Reference Phase	2	1	E	E.A.		" <u>⊨</u>	: A			×	V		-
Offset, s 0	Reference Point	End	ļ	127	50						1	2	3	Y
Uncoordinated Yes	Simult. Gap E/W	Off	Green	-	3.4	30.4	\rightarrow	9.6 7.7	0.0				,	→
Force Mode Fixed		Off	Yellow Red	1.5	3.5 1.5	1.5	2.	-	0.0) ²	0	- ,	
TOTOC MODE T IXEO	Omnun. Gap 1973	OII	IXCU	1.0	1.3	1.3	, Z.	J Z.J	10.0					
Timer Results			EBI		EBT	WBI	L	WBT	NB	L	NBT	SBI		SBT
Assigned Phase					4		\neg	8	5		2	1		6
Case Number					10.0		\neg	12.0	2.0		4.0	2.0		4.0
Phase Duration, s					25.1		\neg	13.2	15.7	7	44.3	7.3		35.9
Change Period, (Y+F	? c), s				5.5			5.5	5.0		5.5	5.0		5.5
Max Allow Headway (x Allow Headway (MAH), s				3.2			3.2	3.1		3.0	3.1		3.2
Queue Clearance Tim	e (gs), s				18.3			3.4	10.0	6	11.5	2.8		27.8
Green Extension Time	e (ge),s				1.2		\Box	0.0	0.2		0.6	0.0		2.3
Phase Call Probability	1				1.00			1.00	0.99	9	1.00	0.33	3	1.00
Max Out Probability					0.00		_	0.01	0.0	1	0.24	0.00		0.00
Movement Group Re	sults			EB			w	B		NB			SB	
Approach Movement			L	T	R	L	T		1	T	R	L	T	R
Assigned Movement			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h		234	323		31		27	173	288	288	16	560	476
Adjusted Saturation F		In	1767	1723		1794		1594	1767	1856	1849	1767	1856	1578
Queue Service Time (10.8	16.3		1.4		1.4	8.6	9.4	9.5	0.8	25.8	25.8
Cycle Queue Clearan			10.8	16.3		1.4		1.4	8.6	9.4	9.5	0.8	25.8	25.8
Green Ratio (g/C)			0.22	0.22		0.09		0.09	0.12	0.43	0.43	0.03	0.34	0.34
Capacity (c), veh/h			386	376		153		136	212	802	799	46	628	534
Volume-to-Capacity R	atio (X)		0.607	0.859		0.199		0.201	0.818	0.360	0.360	0.347	0.891	0.892
Back of Queue (Q),	ft/ln (95 th percentile	:)	205	284		28		25	176	176	172	16	383	327
Back of Queue (Q),	veh/ln (95 th percent	ile)	8.0	11.1		1.1		1.0	6.9	6.9	6.9	0.6	15.0	13.1
Queue Storage Ratio	(RQ) (95 th percent	tile)	0.41	0.57		0.64		0.58	0.35	0.35	0.35	0.03	0.77	0.67
Uniform Delay (d 1),			31.8	34.0		38.4		38.4	38.8	17.3	17.3	43.2	28.3	28.3
Incremental Delay (d	2), s/veh		0.6	2.3		0.2		0.3	3.0	0.1	0.1	0.9	1.0	1.2
Initial Queue Delay (/is), s/veh		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/			32.4	36.3		38.7		38.7	41.8	17.4	17.4	44.1	29.3	29.5
Level of Service (LOS			С	D		D		D	D	В	В	D	С	С
Approach Delay, s/vel			34.7	7	С	38.7		D	23.0)	С	29.6	6	С
Intersection Delay, s/v	reh / LOS				29	9.0						С		
Multimodel Decults							104	P		MD			CD	
Multimodal Results Pedestrian LOS Score	-/10S		2.30	EB	В	2.31	W	B B	1.90	NB	В	2.11	SB	В

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Table 117.Wacker Dr and JFK Rd Saturday Noon-1PM HCS 20 Year Projection Conditions

General Inform	nation								Interse	tion Inf	ormatio	on	, i	석기하다	يا ما
Agency									Duration	ı, h	1.000	1		417	
Analyst				Analys	is Date	5/1/20	24		Area Ty	oe .	Other		15		
Jurisdiction				Time F	Period				PHF		1.00		* *		•
Urban Street		JFK Rd		Analys	is Year	2024			Analysis	Period	1> 7:0	00	7		
Intersection		JFK/Wacker		File Na	ame	Wack	er_Penn	20y	r Update	12-1.xus	,			5 t %	ſ
Project Descrip	tion						_						7	4144	74
Demand Inform	nation				EB			V	/B		NB		1	SB	
Approach Move					T	T R	1	_	T R	1	ΤT	T R	1	ΤŢ	TR
Demand (v), v				517	15	84	23	-	3 28	192	_	6	16	550	44
Demand (V), V	CII/II			317	10	04	23		3 20	132	030	- 0	10	330	44
Signal Informa	tion				T U			Т	8	$\overline{}$					
Cycle, s	106.3	Reference Phase	2	1	" Z			<u>, L</u> 2	Ħ			`	Þ		
Offset, s	0	Reference Point	End		1	Si						1	2	3	Z
Uncoordinated	Yes	Simult. Gap E/W	Off	Green		5.4	38.6	$\overline{}$	1.3 8.5	0.0				,	4
Force Mode	Fixed	Simult. Gap N/S	Off	Yellow Red	1.5	3.5 1.5	1.5	2.	-	0.0) 5	6	-	~
. Siec Mode	1 IACU	Cilitate Gap 14/5	OII	ixcu	1.0	1.0	11.0	۷.	U Z.U	10.0					
Timer Results				EBI		EBT	WBI	П	WBT	NB		NBT	SBI		SBT
Assigned Phase	e				\neg	4		\neg	8	5	\neg	2	1	\neg	6
Case Number					-	10.0		\neg	12.0	2.0		4.0	2.0		4.0
Phase Duration	S				\rightarrow	29.8		_	14.0	18.4	-	54.6	7.9	-	44.1
Change Period,		o) s			$\overline{}$	5.5		\rightarrow	5.5	5.0	-	5.5	5.0	-	5.5
		,-		_	_	3.2	_	-	3.2	3.1	_	3.0	3.1	_	3.2
	ax Allow Headway (<i>MAH</i>), s Jeue Clearance Time (g s), s			_	\rightarrow	23.5	_	-	3.9	13.3	-	13.9	3.1		36.0
	10 /			_	_	0.9	_	+	0.1	0.1	_	1.1	0.0	_	2.6
	een Extension Time (g e), s			_	\rightarrow		_	-		1.00	-		-	_	
Phase Call Prob				_	\rightarrow	1.00	_	\dashv	1.00			1.00	0.42		1.00
Max Out Probal	Dility					0.20			0.00	1.00	,	0.00	0.00	,	0.00
Movement Gro	up Res	ults			EB			W	В		NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move	ment			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow F	Rate (v), veh/h		259	358		34		30	192	318	318	18	617	52
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1767	1724		1794		1590	1767	1856	1849	1767	1856	157
Queue Service	Time (g s), S		14.1	21.5		1.9		1.9	11.3	11.9	11.9	1.1	33.7	34.
Cycle Queue C				14.1	21.5		1.9		1.9	11.3	11.9	11.9	1.1	33.7	34.
Green Ratio (g		,.		0.23	0.23		0.08		0.08	0.13	0.46	0.46	0.03	0.36	0.3
Capacity (c), v				405	395		143		127	222	856	853	49	674	57
Volume-to-Capa		itio (X)		0.639	0.906		0.236		0.238	0.865	0.372	0.372	0.377	0.915	0.92
		t/In (95 th percentile)	258	424		38		34	276	220	214	22	484	41
		eh/ln (95 th percenti		10.1	16.5		1.5		1.4	10.8	8.6	8.6	0.9	18.9	16.
		RQ) (95 th percent		0.52	0.85		0.86		0.77	0.55	0.44	0.44	0.04	0.97	0.8
Uniform Delay (37.0	39.9		45.9		45.9	45.6	18.6	18.6	50.8	32.3	32.
Incremental De	. ,.			0.9	20.1		0.3		0.4	27.0	0.1	0.1	0.7	2.6	3.3
Initial Queue De		,-		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (37.9	60.0		46.2		46.3	72.6	18.7	18.7	51.5	34.9	35.
Level of Service				D D	E		D D		D 40.3	72.0 E	B	B	D	C	D D
				50.7		D	46.2	Т	D	31.2		С	35.5		D
Approach Delay				30.7					U	31.4					U
Intersection Del	idy, S/VE	en / LOS				31	7.9						D		
Multimodal Re	sults				EB			W	В		NB			SB	
Dodostrian I OC	Score	/ LOS		2.31		В	2.32	Т	В	1.91	1	В	2.11		В
Pedesiliali LOS	lestrian LOS Score / LOS /cle LOS Score / LOS				_			_		_	-		_	_	

Table 118.Wacker Dr and JFK Rd Saturday Noon-1PM HCS 20 Year Projection Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersect	ion R	esu	lts Sur	nmary	,				
General Inform	nation								Interse	tion Inf	ormatio	on	- i	4741	le C
Agency									Duration	ı, h	1.000		_		
Analyst				Analys	sis Date	5/1/20)24		Area Ty	oe	Other		4		
Jurisdiction				Time F					PHF		1.00		÷ +		7
Urban Street		JFK Rd		Analys	sis Year	r 2024			Analysis	Period	1> 7:0	00	2		
Intersection		JFK/Wacker		File N	ame	Wack	er_Penn	20y	r Update	12-1(Ov	erall De	lay).xus		111	
Project Descrip	tion							_					7	ৰ 1 কম্ব	ÞΥ
Demand Infor	mation		_		EB	_	$\overline{}$	V	/B	$\overline{}$	NB	_		SB	
Approach Move	ement			L	T	R	L	Τ.	T R	L	T	R	L	T	R
Demand (v), v	/eh/h			517	15	84	23	1	3 28	192	630	6	16	550	449
Signal Informa	ation						1 11	7	5		7				
Cycle, s	108.2	Reference Phase	2	1	7		- W	_ 🛂	月		_ \		1z		
Offset, s	0	Reference Point	End		1							1	2	3	Δ
Uncoordinated	_	Simult. Gap E/W	Off	Green		5.8 3.5	39.3		5.1 8.5	0.0		راح		_	4
Force Mode	Fixed	Simult. Gap N/S	Off	Yellow	1.5	1.5	4.0 1.5	3. 2.		0.0		\ [4	0	7	
TOTOC MOUC	TIXEU	Official Coap 1970	Oil	rteu	1.5	1.3	1.5	<u>_</u>	2.3	10.0					
Timer Results				EBI	L	EBT	WBI		WBT	NB	L	NBT	SBI		SBT
Assigned Phas	е					4		_	8	5		2	1		6
Case Number						10.0		\perp	12.0	2.0		4.0	2.0		4.0
Phase Duration	1, S					30.6			14.0	18.8	3	55.6	8.0		44.8
Change Period	l, (Y+R	c), S				5.5			5.5	5.0		5.5	5.0		5.5
Max Allow Hea	dway (/	ИАН), s				3.2			3.2	3.1		3.0	3.1		3.2
Queue Clearan	ice Time	(gs), S				23.8			3.9	13.	_	14.0	3.1		36.6
Green Extension	on Time	(ge), S				1.3			0.1	0.3		1.1	0.0		2.7
Phase Call Pro	bability					1.00			1.00	1.0	_	1.00	0.42	2	1.00
Max Out Proba	bility		_		_	0.00		_	0.00	0.0		0.00	0.00		0.00
Movement Gro	oup Res	sults			EB			W	В		NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	T	R	L	Т	R
Assigned Move	ement			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow	Rate (v), veh/h		259	358		34		30	192	318	318	18	617	527
Adjusted Satur	ation Flo	w Rate (s), veh/h/l	n	1767	1724		1794		1590	1767	1856	1849	1767	1856	1578
Queue Service	Time (g s), S		14.3	21.8		1.9		1.9	11.5	12.0	12.0	1.1	34.4	34.6
Cycle Queue C	learance	e Time (g ε), s		14.3	21.8		1.9		1.9	11.5	12.0	12.0	1.1	34.4	34.6
Green Ratio (g	2/C)			0.23	0.23		0.08		0.08	0.13	0.46	0.46	0.03	0.36	0.36
Capacity (c),	veh/h			410	400		142		126	225	859	857	48	674	573
Volume-to-Cap	acity Ra	tio (X)		0.631	0.895		0.238		0.241	0.853	0.371	0.371	0.378	0.916	0.92
Back of Queue	(Q), fl	t/In (95 th percentile)	261	368		39		35	229	223	218	23	500	427
Back of Queue	(Q), ve	eh/In (95 th percenti	le)	10.2	14.4		1.5		1.4	9.0	8.7	8.7	0.9	19.5	17.1
Queue Storage	Ratio (RQ) (95 th percent	ile)	0.52	0.74		0.88		0.79	0.46	0.45	0.45	0.05	1.00	0.8
Uniform Delay	(d 1), Si	/veh		37.4	40.3		46.8		46.8	46.2	18.8	18.8	51.7	32.9	33.
Incremental De	elay (d 2), s/veh		0.6	3.0		0.3		0.4	3.7	0.1	0.1	0.9	1.1	1.4
Initial Queue D	elay (d	з), s/veh		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay ((d), s/ve	eh		38.0	43.3		47.1		47.2	49.9	18.9	18.9	52.6	34.0	34.4
Level of Servic	e (LOS)			D	D		D		D	D	В	В	D	С	С
Approach Dela	y, s/veh	/LOS		41.1	1	D	47.2		D	26.	1	С	34.5	5	С
Intersection De	lay, s/ve	h / LOS				3	3.7						С		
					EB			W	R		NB			SB	
Multimodal Do	Iltimodal Results							V V I			IND				
Multimodal Re Pedestrian LOS		/1.08		2.31		В	2.32	<u> </u>	В	1.9	_	В	2.11		В

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Table 119. Pennsylvania Ave and JFK Rd Saturday 11-12PM HCS Existing Conditions

		HCS	Sigr	nalize	d Inte	ersect	ion R	esult	s Sun	nmary	,				
										_					
General Inforn	nation							T I	ntersec	tion Inf	ormatio	on	, i	세시사.	ի <u>և</u>
Agency								1	Duration	h	1.000	1		417	
Analyst				Analys	is Date	2/15/2	2024	/	Area Typ	е	Other				
Jurisdiction				Time F	Period			F	PHF		1.00				=
Urban Street		John F Kennedy		Analys	is Year	2024		7	Analysis	Period	1> 12	:00	12		*
Intersection		11am-12pm Penn/J	FK	File Na	ame	Inters	ection (Penn-J	FK).xus					513	
Project Descrip	tion												7	4144	1
										-1					
Demand Inforr	nation				EB			WB	3		NB			SB	
Approach Move	ement			L	Т	R	L	T	R	L	Т	R	L	T	R
Demand (v), v	eh/h			174	148	126	103	130	72	140	717	87	88	760	150
Signal Informa				l	7		1	1 2		1 2	₽ ,			_	45
Cycle, s	120.0	Reference Phase	2		15	51	2 St	آ]ج	Ħ	R		`	2	- ^` ,	4
Offset, s	0	Reference Point	End	Green	6.6	0.3	62.2	8.7	3.2	18.3	3 1				
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.0	0.0	4.0	4.0	0.0	4.0		_	V		→ .
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	0.0	1.2		5	6	7	Y 8
Timer Results				EBI	-	EBT	WB	L	WBT	NB	_	NBT	SBI	_	SBT
Assigned Phas	e			3	\perp	8	7	\perp	4	1		6	5		2
Case Number				1.1	\perp	4.0	2.0		3.0	1.1		4.0	1.1		4.0
Phase Duration	I, S			17.1		26.8	13.9	9	23.5	12.1		67.5	11.8	3	67.3
Change Period	, (Y+R	c), S		5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Hea	dway (I	<i>MAH</i>), s		3.1		3.2	3.1		3.2	3.1		0.0	3.1		0.0
Queue Clearan	ce Time	e (g s), s		11.8	3	20.7	8.9		9.7	5.6			4.6		
Green Extension	n Time	(ge), S		0.1		8.0	0.1		0.9	0.2		0.0	0.1		0.0
Phase Call Pro	bability			1.00)	1.00	0.97	7	1.00	0.98	3		0.98	5	
Max Out Proba	bility			0.13	3	0.00	0.00		0.00	0.00)		0.00)	
Movement Gro	up Res	sults			EB			WB			NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow I), veh/h		174	274		103	130	72	122	356	343	88	468	442
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1767	1714		1767	1856	1572	1838	1856	1785	1838	1856	1749
Queue Service	Time (q s), S		9.8	18.7		6.9	7.7	4.9	3.6	13.4	13.3	2.6	19.5	19.5
Cycle Queue C	learance	e Time (g o), s		9.8	18.7		6.9	7.7	4.9	3.6	13.4	13.3	2.6	19.5	19.5
Green Ratio (g		10 //		0.25	0.18		0.07	0.15	0.15	0.58	0.52	0.52	0.57	0.52	0.52
Capacity (c), v				347	308		128	284	240	390	965	928	463	961	906
Volume-to-Cap	acity Ra	itio (X)		0.502	0.889		0.805	0.458	0.300	0.312	0.368	0.370	0.190	0.487	0.488
		t/In (95 th percentile	:)	195	339		148	164	88	70	247	229	48	343	320
		eh/In (95 th percent		7.6	13.2		5.8	6.4	3.4	2.7	9.6	9.2	1.9	13.4	12.8
		RQ) (95 th percent		0.78	0.00		0.59	0.00	0.35	0.30	0.00	0.00	0.30	0.00	0.00
Uniform Delay		, , ,	-,	37.5	48.0		54.8	46.3	45.1	14.2	16.7	16.3	12.6	18.6	18.7
Incremental De				0.4	6.5		4.6	0.4	0.3	0.2	1.0	1.1	0.1	1.8	1.9
Initial Queue D		,		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (37.9	54.5		59.4	46.7	45.4	14.3	17.7	17.4	12.6	20.4	20.5
Level of Service				D	D		E	D	D	B	В	B	B	C	C
Approach Dela				48.1		D	50.7		D	17.1		В	19.8		В
Intersection De				40.			7.5			-17.			C		
Multimodal Re	sults				EB			WB			NB			SB	
Pedestrian LOS	Score	/ LOS		2.31		В	2.31	1	В	2.09		В	1.90)	В
Bicycle LOS So	ore / LC	OS		1.23	3	Α	0.99	9	Α	1.27	7	Α	1.31	1	Α

Table 120. Pennsylvania Ave and JFK Rd Saturday 11-12PM HCS Existing Conditions Optimized

		1100	Joigi	iuiiZC	u mic	1356	JOH K	coul	ts Sun	ııııaı y					
General Inform	ation								Intersec	tion Infe	ormatic	n	J.	4.14.1	Ja lu
Agency								_	Duration.		1.000			नार	
Analyst				Analys	is Date	2/15/2	2024	$\overline{}$	Area Typ		Other				
Jurisdiction				Time F		2/10/2	-024	$\overline{}$	PHF		1.00		- ;		*- +
Urban Street		John F Kennedy		_		2024		\rightarrow	Analysis	Doriod	1> 12	.00	- 5		K-
			EV	-	sis Year	+	oction (_				.00	- 5		
Intersection		11am-12pm Penn/J	rĸ	File Na	ame	Inters	ection (i	Penn-J	IFK)_Ove	rall_De	iay.xus		- 4	ጎተተ	40
Project Descrip	tion		-	-	-	-	-	-		-	-	-		7 1 7 1	P. III
Demand Inform	nation				EB			WE	3		NB			SB	
Approach Move	ment			L	Т	R	L	Т	R	L	Т	R	L	Т	TR
Demand (v), v				174	148	126	103	130	0 72	140	717	87	88	760	15
Signal Informa					6		215	La	Ħ					,	4
Cycle, s	74.2	Reference Phase	2	-	5	50	Z \ S∆	rŘ.	E			1	2	3	
Offset, s	0	Reference Point	End	Green	5.9	0.6	22.9	10.	0 14.3	0.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	4.0	4.0	0.0	`	×	Ψ	<u></u>	- ♦
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	1.1	0.0		5	6	7	Y
Timer Results				EDI		EDT	WP		WPT	NDI		NDT	e Di		CDT
Assigned Phase	2			EBI		EBT 8	WB	_	WBT 4	NBI 1	-	NBT 6	SBI 5	-	SBT 2
Case Number						10.0		+	9.0	1.1	_	4.0	1.1		4.0
	nase Duration, s				_	19.4	_	_	15.2	11.6		28.5	11.1	_	28.0
	nase Duration, s nange Period, (Y+R c), s				_	5.1	_	_	5.2	5.2	-	5.1	5.2	_	5.1
		•		_	_	3.2	_	-	3.1	3.1	-	3.1	3.1	_	3.1
Max Allow Head Queue Clearan				_		13.4		-	6.8	5.1	\rightarrow	14.1	4.3	-	19.4
				-	-	0.8	-	-	0.4	0.1	_	3.4	0.1	_	3.4
Green Extensio		(g e), S		_		1.00		_	1.00	0.1		1.00	0.1	_	1.00
Phase Call Prob				-	-	0.00		-	0.00	0.92	_	0.00	0.00	_	0.00
Max Out Proba	Dility					0.00		-	0.00	0.00		0.00	0.00		0.00
Movement Gro	up Res	ults			EB			WB			NB			SB	
Approach Move	ment			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move	ment			3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow F	Rate (v), veh/h		174	274		103	130	72	122	356	343	88	468	442
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1767	1714		1767	1856	1572	1838	1856	1785	1838	1856	174
Queue Service	Time (g s), S		6.5	11.4		4.0	4.8	3.1	3.2	12.0	12.1	2.3	17.4	17.
Cycle Queue C				6.5	11.4		4.0	4.8	3.1	3.2	12.0	12.1	2.3	17.4	17.4
Green Ratio (g				0.19	0.19		0.13	0.13	0.13	0.40	0.32	0.32	0.39	0.31	0.3
Capacity (c), v				341	331		237	249	211	305	587	564	341	572	540
Volume-to-Capa		itio (X)		0.510	0.828		0.434	0.521	0.341	0.399	0.606	0.608	0.258	0.818	0.81
		t/In (95 th percentile	:)	122	208		76	97	52	57	209	199	41	296	276
		eh/ln (95 th percenti	•	4.8	8.1		3.0	3.8	2.0	2.2	8.2	8.0	1.6	11.6	11.
Queue Storage	Ratio (RQ) (95 th percent	tile)	0.67	0.00		0.66	0.00	0.45	0.57	0.00	0.00	0.34	0.00	0.0
Uniform Delay (,	26.8	28.8		29.6	29.9	_	17.0	21.5	21.5	16.0	23.8	23.
Incremental De				0.4	2.1		0.5	0.6	0.4	0.3	0.3	0.3	0.1	1.1	1.2
Initial Queue De				0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (27.3	30.9		30.0	30.6	-	17.3	21.8	21.8	16.1	24.9	25.
Level of Service	(LOS)			С	С		С	С	С	В	С	С	В	С	С
Approach Delay				29.5		С	30.1		С	21.2		С	24.2		С
Intersection De							4.8						С		
	Iltimodal Results							WB			NB			SB	
Multimodal Re							_			_					
Multimodal Re		/ LOS		2.30	EB	В	2.29		В	2.10		В	1.91	\Box	В

Table 121. Pennsylvania Ave and JFK Rd Saturday 11-12PM HCS 5-yr Conditions Optimized

	HC	s Sigr	nalize	d Inte	rsect	ion R	esult	ts Sun	nmary	•				
General Information								Intersec	tion Inf	ormatio	on	1	474	ام ل <u>ر</u>
Agency							1	Duration,	, h	1.000			417	
Analyst			Analys	is Date	2/15/2	024	1	Area Typ	е	Other		1.		
Jurisdiction			Time F	Period				PHF		1.00		*=		-
Urban Street	John F Kennedy		Analys	is Year	2024		1	Analysis	Period	1> 12	:00	7		
Intersection	11am-12pm Penn/J	IFK	File Na		_	ection (F	Penn-J	FK) Ove	erall De	lav 5vr	xus	1	ጎተት	
Project Description								/_		7_ 7		1	1144	7 4
Demand Information				EB		1	WE	3		NB			SB	
Approach Movement			L	T	□ R	1	T	R	1	T	T R	L	T	R
Demand (v), veh/h			183	156	132	108	137	_	147	756	91	92	799	158
Demand (v), venim			100	100	102	100	107	70	147	700	31	JZ	755	100
Signal Information				ŢŢ	Т		$\overline{}$	5	\top					
Cycle, s 77.7	Reference Phase	2	1		Str		2 ∀	7			\ 4	P _	~ │	
Offset, s 0	Reference Point	End	Green	0.4				15.7		_	1	2	3	4
Uncoordinated Yes	Simult. Gap E/W	On	Yellow	-	0.5	4.0	4.0	4.0	0.0	ر		rta .		
Force Mode Fixed	· ·	On	Red	1.2	0.0	1.1	1.2	1.1	0.0		5	Y 6	7	- ♦.
Timer Results			EBL		EBT	WB	L	WBT	NBI		NBT	SBI		SBT
Assigned Phase				\neg	8		\neg	4	1	\neg	6	5	\neg	2
Case Number				-	10.0			9.0	1.1		4.0	1.1		4.0
Phase Duration, s					20.8		\neg	15.2	11.7	,	30.5	11.3	-	30.0
Change Period, (Y+R	a). S			_	5.1		\rightarrow	5.2	5.2	-	5.1	5.2		5.1
Max Allow Headway (,, , , , , , , , , , , , , , , , , , ,			-	3.2		\rightarrow	3.1	3.1	-	3.1	3.1	_	3.1
Queue Clearance Time				\rightarrow	14.6			7.4	5.4		14.9	4.5	-	21.1
Green Extension Time	10 /-		_	_	0.9	_	_	0.4	0.2	_	3.6	0.0	_	3.6
Phase Call Probability	(g =), 3		_	\rightarrow	1.00	_	_	1.00	0.93		1.00	0.86		1.00
Max Out Probability			_	-	0.00	_	-	0.07	0.00	-	0.00	0.14	-	0.00
wax out i lobability					3.00			0.01	0.00		0.00	0.14		0.00
Movement Group Re	sults			EB			WB			NB			SB	
Approach Movement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Movement			3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (/), veh/h		183	288		108	137	76	125	366	353	92	493	464
Adjusted Saturation FI	**	In	1767	1708		1767	1856	1554	1838	1856	1785	1838	1856	1748
Queue Service Time (7.2	12.6		4.4	5.4	3.5	3.4	12.9	12.9	2.5	19.1	19.1
Cycle Queue Clearand			7.2	12.6		4.4	5.4	3.5	3.4	12.9	12.9	2.5	19.1	19.1
Green Ratio (g/C)	(3-7,-		0.20	0.20		0.13	0.13	_	0.41	0.33	0.33	0.40	0.32	0.32
Capacity (c), veh/h			357	345		226	238	199	294	608	585	341	596	562
Volume-to-Capacity R	atio (X)		0.512	0.834		0.477	0.576		0.424	0.601	0.603	0.269	0.826	0.826
Back of Queue (Q),		2)	136	226		86	110	59	61	223	212	45	323	301
Back of Queue (Q), v			5.3	8.8		3.3	4.3	2.3	2.4	8.7	8.5	1.7	12.6	12.0
Queue Storage Ratio			0.74	0.00		0.74	0.00	0.51	0.61	0.00	0.00	0.37	0.00	0.00
Uniform Delay (d 1), s	- / (27.7	29.9		31.6	32.0	31.2	17.7	22.0	22.0	16.3	24.5	24.5
Incremental Delay (d			0.4	2.1		0.6	0.8	0.4	0.3	0.3	0.3	0.2	1.1	1.2
Initial Queue Delay (d			0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/v	·		28.1	31.9		32.2	32.8	31.6	18.0	22.3	22.3	16.4	25.6	25.7
Level of Service (LOS			C C	C C		C	C C	C	B	C C	C C	B	C C	C C
			30.5		С	32.3		С			С	24.8		C
Approach Delay, s/veh Intersection Delay, s/v			30.5			32.3 5.7)	C	21.7			C 24.8	·	C
microccion Delay, S/V					20									
				EB			WB			NB			SB	
Multimodal Results													00	
Multimodal Results Pedestrian LOS Score	LOS		2.30		В	2.29		В	2.10		В	1.91		В
			2.30		B A	2.29	•	B A	2.10		B A	1.91 1.35		B A

Table 122. Pennsylvania Ave and JFK Rd Saturday 11-12PM HCS 10-yr Conditions Optimized

			alize						u. y					
General Information								Intersect	tion Inf	ormatic	\n		474	F U
Agency							-	Duration,		1.000			417	
<u> </u>			Apalyo	is Date	0/45/2	024	\rightarrow	Area Typ						
Analyst					2/13/2	024		PHF	е	Other				<u>.</u>
Jurisdiction	Inha E Kananda		Time F		0004		-		Desiral	1.00	-00			ĸ-
Urban Street	John F Kennedy	FIG		is Year	-	Ali //	_	Analysis		1> 12		- 5		<u>_</u>
Intersection	11am-12pm Penn/J	FK	File Na	ame	Interse	ection (F	enn-	JFK)_Ove	erali_De	lay_10y	r.xus	- 1	ጎተት	h . C
Project Description														E.L.
Demand Information				EB			W	3		NB			SB	
Approach Movement			L	Т	R	1	Т	R	1	Т	R	1 [Т	R
Demand (v), veh/h			192	163	139	114	14	4 80	155	794	96	97	840	16
Signal Information				7				2_					_	4
Cycle, s 81.6	Reference Phase	2		18	Sti	z 540	z≓.	2		_ ^	ነ /4	<u> </u>	- ^∵	
Offset, s 0	Reference Point	End	Green	6.3	0.4	27.2	10.	0 17.0	0.0			2	3	
Uncoordinated Yes	Simult. Gap E/W	On	Yellow	-	0.0	4.0	4.0	-	0.0	\		W	_	
Force Mode Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	1.1	0.0		5	6	7	÷
Timer Results			EBL	_	EBT	WB	L	WBT	NBI	-	NBT	SBI	-	SBT
Assigned Phase					8			4	1		6	5		2
Case Number				1	10.0		_	9.0	1.1		4.0	1.1		4.0
Phase Duration, s				2	22.1		\perp	15.2	11.9		32.8	11.5	5	32.3
Change Period, (Y+R	c), S				5.1			5.2	5.2		5.1	5.2		5.1
Max Allow Headway (MAH), s				3.2		\perp	3.1	3.1		3.1	3.1	\perp	3.1
Queue Clearance Time	e (g ≈), s			1	16.0			8.1	5.8		16.6	4.7		23.1
Green Extension Time	(g e), S			\rightarrow	0.9		\perp	0.6	0.2		3.9	0.1	\rightarrow	3.8
Phase Call Probability				1	1.00		_	1.00	0.95	5	1.00	0.89		1.00
Max Out Probability					0.00			0.00	0.00)	0.00	0.00		0.03
Movement Croup Bo	culte			EB			WB			NB			SB	
Movement Group Re Approach Movement	suits		L	T	R	L	T	T R	L	T	R	L	T	R
Assigned Movement			3	8	18	7	4	14	1	6	16	5	2	12
	() veh/h		192	302	10	114	144	80	135	394	380	97	518	488
Adjusted Flow Rate () Adjusted Saturation FI	*	n	1767	1705		1767	1856	-	1838	1856	1785	1838	1856	174
		"	7.9	14.0		5.0	6.1	3.9	3.8	14.6	14.6	2.7	21.1	21.
Queue Service Time (Cycle Queue Clearand	•		7.9	14.0		5.0	6.1	3.9	3.8	14.6	14.6	2.7	21.1	21.
Green Ratio (g/C)	te fille (g a), s		0.21	0.21		0.12	0.12		0.42	0.34	0.34	0.41	0.33	0.3
			371	\vdash		_	227	189	284	631	607	330	621	586
Canacity (c) venin						216		103	204			0.294	0.833	0.83
Capacity (c), veh/h Volume-to-Capacity R:	atio (X)		-	358 0.844		0.528		5 0 424	0.475			0.234	0.000	32
Volume-to-Capacity R)	0.518	0.844		0.528	0.63		0.475	0.625	0.626	49	352	
Volume-to-Capacity Rack of Queue (Q),	ft/In (95 th percentile	_	0.518 150	0.844 246		0.528 97	0.635 125	67	69	248	235	49	352 13.7	_
Volume-to-Capacity Rack of Queue (Q), 1 Back of Queue (Q), v	ft/In (95 th percentile reh/In (95 th percenti	le)	0.518 150 5.9	0.844 246 9.6		0.528 97 3.8	0.635 125 4.9	67 2.6	69 2.7	248 9.7	235 9.4	1.9	13.7	13.
Volume-to-Capacity R Back of Queue (Q), Back of Queue (Q), v Queue Storage Ratio	ft/In (95 th percentile reh/In (95 th percenti (RQ) (95 th percent	le)	0.518 150 5.9 0.82	0.844 246 9.6 0.00		0.528 97 3.8 0.84	0.635 125 4.9 0.00	67 2.6 0.58	69 2.7 0.69	9.7 0.00	235 9.4 0.00	1.9 0.41	13.7 0.00	13. 0.0
Volume-to-Capacity Ri Back of Queue (Q), b Back of Queue (Q), v Queue Storage Ratio Uniform Delay (d1), s	ft/In (95 th percentile reh/In (95 th percentil (RQ) (95 th percent s/veh	le)	0.518 150 5.9 0.82 28.7	0.844 246 9.6 0.00 31.1		0.528 97 3.8 0.84 33.8	0.638 125 4.9 0.00 34.3	67 2.6 0.58 33.3	69 2.7 0.69 18.6	9.7 0.00 22.7	235 9.4 0.00 22.7	1.9 0.41 16.8	13.7 0.00 25.2	13. 0.0 25.
Volume-to-Capacity R. Back of Queue (Q), Back of Queue (Q), Queue Storage Ratio Uniform Delay (d 1), SIncremental Delay (d	ft/In (95 th percentile reh/In (95 th percentil (RQ) (95 th percent s/veh 2), s/veh	le)	0.518 150 5.9 0.82 28.7 0.4	0.844 246 9.6 0.00 31.1 2.2		0.528 97 3.8 0.84 33.8 0.7	0.638 125 4.9 0.00 34.3 1.1	67 2.6 0.58 33.3 0.6	69 2.7 0.69 18.6 0.4	248 9.7 0.00 22.7 0.3	235 9.4 0.00 22.7 0.3	1.9 0.41 16.8 0.2	13.7 0.00 25.2 1.2	13. 0.0 25. 1.2
Volume-to-Capacity R: Back of Queue (Q), Back of Queue (Q), v Queue Storage Ratio Uniform Delay (d 1), s Incremental Delay (d Initial Queue Delay (d	ft/in (95 th percentile reh/in (95 th percentil (RQ) (95 th percent s/veh 2), s/veh 3), s/veh	le)	0.518 150 5.9 0.82 28.7 0.4 0.0	0.844 246 9.6 0.00 31.1 2.2 0.0		0.528 97 3.8 0.84 33.8 0.7 0.0	0.638 125 4.9 0.00 34.3 1.1	67 2.6 0.58 33.3 0.6 0.0	69 2.7 0.69 18.6 0.4 0.0	248 9.7 0.00 22.7 0.3 0.0	9.4 0.00 22.7 0.3 0.0	1.9 0.41 16.8 0.2 0.0	13.7 0.00 25.2 1.2 0.0	13. 0.0 25. 1.2 0.0
Volume-to-Capacity R: Back of Queue (Q), Back of Queue (Q), Queue Storage Ratio Uniform Delay (d 1), Incremental Delay (d Initial Queue Delay (d), S/V	ft/in (95 th percentile eh/in (95 th percentile (RQ) (95 th percent s/veh 2), s/veh 13), s/veh eh	le)	0.518 150 5.9 0.82 28.7 0.4 0.0 29.1	0.844 246 9.6 0.00 31.1 2.2 0.0 33.3		0.528 97 3.8 0.84 33.8 0.7 0.0 34.5	0.638 125 4.9 0.00 34.3 1.1 0.0 35.4	67 2.6 0.58 33.3 0.6 0.0 33.9	69 2.7 0.69 18.6 0.4 0.0 18.9	248 9.7 0.00 22.7 0.3 0.0 23.0	235 9.4 0.00 22.7 0.3 0.0 23.0	1.9 0.41 16.8 0.2 0.0 16.9	13.7 0.00 25.2 1.2 0.0 26.3	13. 0.0 25. 1.2 0.0 26.
Volume-to-Capacity R: Back of Queue (Q), Back of Queue (Q), Queue Storage Ratio Uniform Delay (d 1), Incremental Delay (d Initial Queue Delay (d Control Delay (d), s/v Level of Service (LOS	ft/in (95 th percentile reh/in (95 th percentile (RQ) (95 th percent s/veh 2), s/veh 13), s/veh reh	le)	0.518 150 5.9 0.82 28.7 0.4 0.0 29.1	0.844 246 9.6 0.00 31.1 2.2 0.0 33.3 C	C	0.528 97 3.8 0.84 33.8 0.7 0.0 34.5	0.638 125 4.9 0.00 34.3 1.1 0.0 35.4	67 2.6 0.58 33.3 0.6 0.0 33.9 C	69 2.7 0.69 18.6 0.4 0.0 18.9	248 9.7 0.00 22.7 0.3 0.0 23.0	235 9.4 0.00 22.7 0.3 0.0 23.0	1.9 0.41 16.8 0.2 0.0 16.9	13.7 0.00 25.2 1.2 0.0 26.3	13. 0.0 25. 1.2 0.0 26.
Volume-to-Capacity R: Back of Queue (Q), Back of Queue (Q), Queue Storage Ratio Uniform Delay (d 1), Incremental Delay (d Initial Queue Delay (d Control Delay (d), s/v Level of Service (LOS Approach Delay, s/veh	ft/In (95 th percentile reh/In (95 th percentile reh/In (95 th percentile (RQ) (95 th percentile s/veh 2), s/veh 13), s/veh reh)	le)	0.518 150 5.9 0.82 28.7 0.4 0.0 29.1	0.844 246 9.6 0.00 31.1 2.2 0.0 33.3 C	C 26	0.528 97 3.8 0.84 33.8 0.7 0.0 34.5 C 34.7	0.638 125 4.9 0.00 34.3 1.1 0.0 35.4	67 2.6 0.58 33.3 0.6 0.0 33.9	69 2.7 0.69 18.6 0.4 0.0 18.9	248 9.7 0.00 22.7 0.3 0.0 23.0	235 9.4 0.00 22.7 0.3 0.0 23.0 C	1.9 0.41 16.8 0.2 0.0 16.9 B	13.7 0.00 25.2 1.2 0.0 26.3	13. 0.0 25. 1.2 0.0 26.
Volume-to-Capacity R: Back of Queue (Q), Back of Queue (Q), Queue Storage Ratio Uniform Delay (d 1), Incremental Delay (d Initial Queue Delay (d) Control Delay (d), s/v Level of Service (LOS Approach Delay, s/veh	ft/In (95 th percentile reh/In (95 th percentile reh/In (95 th percentile (RQ) (95 th percentile s/veh 2), s/veh 13), s/veh reh)	le)	0.518 150 5.9 0.82 28.7 0.4 0.0 29.1	0.844 246 9.6 0.00 31.1 2.2 0.0 33.3 C		0.528 97 3.8 0.84 33.8 0.7 0.0 34.5	0.638 125 4.9 0.00 34.3 1.1 0.0 35.4	67 2.6 0.58 33.3 0.6 0.0 33.9 C	69 2.7 0.69 18.6 0.4 0.0 18.9	248 9.7 0.00 22.7 0.3 0.0 23.0	235 9.4 0.00 22.7 0.3 0.0 23.0 C	1.9 0.41 16.8 0.2 0.0 16.9	13.7 0.00 25.2 1.2 0.0 26.3	13. 0.0 25. 1.2 0.0 26.
Volume-to-Capacity R. Back of Queue (Q), Back of Queue (Q), Queue Storage Ratio (Uniform Delay (d 1), SIN Incremental Delay (d Initial Queue Delay (d), SIN Level of Service (LOS Approach Delay, SIN Incresection	ft/In (95 th percentile reh/In (95 th percentile reh/In (95 th percentile (RQ) (95 th percentile s/veh 2), s/veh 13), s/veh reh)	le)	0.518 150 5.9 0.82 28.7 0.4 0.0 29.1	0.844 246 9.6 0.00 31.1 2.2 0.0 33.3 C		0.528 97 3.8 0.84 33.8 0.7 0.0 34.5 C 34.7	0.638 125 4.9 0.00 34.3 1.1 0.0 35.4	67 2.6 0.58 33.3 0.6 0.0 33.9 C	69 2.7 0.69 18.6 0.4 0.0 18.9	248 9.7 0.00 22.7 0.3 0.0 23.0	235 9.4 0.00 22.7 0.3 0.0 23.0 C	1.9 0.41 16.8 0.2 0.0 16.9 B	13.7 0.00 25.2 1.2 0.0 26.3	13. 0.0 25. 1.2 0.0 26.
Volume-to-Capacity R: Back of Queue (Q), Back of Queue (Q), Queue Storage Ratio Uniform Delay (d 1), Incremental Delay (d Initial Queue Delay (d	ft/in (95 th percentile reh/in (95 th percentile reh/in (95 th percentil (RQ) (95 th percent s/veh 2), s/veh d 3), s/veh reh) 1 / LOS eh / LOS	le)	0.518 150 5.9 0.82 28.7 0.4 0.0 29.1	0.844 246 9.6 0.00 31.1 2.2 0.0 33.3 C		0.528 97 3.8 0.84 33.8 0.7 0.0 34.5 C 34.7	0.638 125 4.9 0.00 34.3 1.1 0.0 35.4 D	67 2.6 0.58 33.3 0.6 0.0 33.9 C	69 2.7 0.69 18.6 0.4 0.0 18.9	248 9.7 0.00 22.7 0.3 0.0 23.0 C	235 9.4 0.00 22.7 0.3 0.0 23.0 C	1.9 0.41 16.8 0.2 0.0 16.9 B	13.7 0.00 25.2 1.2 0.0 26.3 C	13. 0.0 25. 1.2 0.0 26.

Table 123. Pennsylvania Ave and JFK Rd Saturday 11-12PM HCS 20-yr Conditions Optimized

		HCS	Sigr	nalize	d Inte	rsect	ion R	esul	ts Sun	nmary	'				
General Inform	nation								Intersec	tion Inf	ormatic	n		411	
Agency									Duration,	, h	1.000		-	4+5	
Analyst				Analys	is Date	2/15/2	2024		Area Typ	е	Other		-f ₀		
Jurisdiction				Time F	Period				PHF		1.00		2		-
Urban Street		John F Kennedy		Analys	is Year	2024			Analysis	Period	1> 12	:00	7		
Intersection		11am-12pm Penn/J	FK	File Na	ame	Inters	ection (F	Penn-	JFK)_Ove	erall_De	lay_20y	r.xus		5.1%	
Project Descript	tion	·					,		/=				7	4144	11 14
Demand Inform	nation				EB			W	В		NB			SB	
Approach Move	ement			L	Т	R	L	T	R	L	Т	R	L	T	R
Demand (v), v	eh/h			212	181	154	126	15	9 88	171	877	106	107	927	183
							1 112								
Signal Informa					6		25	1 2	\succeq					,	-5-
Cycle, s	90.9	Reference Phase	2		5	Sti	Z S1	Z R	6) "	2	3	
Offset, s	0	Reference Point	End	Green	6.6	0.3	32.8	10.	1 20.6	0.0	T				
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	0.0	4.0	4.0	$\overline{}$	0.0		×	Φ		- ♦
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	1.1	0.0		5	6	7	Ŋ
Timer Results				EBI	-	EBT	WB	L	WBT	NBI	-	NBT	SBI	-	SBT
Assigned Phase	e			_	_	8	_	_	4	1	_	6	5	\rightarrow	2
Case Number	ase Number ase Duration, s				-	10.0		_	9.0	1.1		4.0	1.1	-	4.0
Phase Duration	· · · · · · · · · · · · · · · · · · ·					25.7		_	15.3	12.1	-	38.2	11.8	-	37.9
Change Period,	ange Period, (Y+R o), s					5.1			5.2	5.2		5.1	5.2		5.1
Max Allow Head	dway (I	<i>МАН</i>), s				3.2			3.2	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	(g s), S				19.3			9.6	6.5		19.9	5.2		28.0
Green Extensio	n Time	(ge), S				1.1			0.3	0.2		4.5	0.2		4.5
Phase Call Prob	bability					1.00			1.00	0.98	3	1.00	0.93	3	1.00
Max Out Probal	bility					0.00			0.41	0.00)	0.02	0.00)	0.03
Movement Gro		ults		_	EB			WB	_		NB		_	SB	
Approach Move				L	T	R	L	T	R	L	T	R	L	Т	R
Assigned Move	ment			3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow F	Rate (v), veh/h		212	335		126	159		149	437	420	107	571	539
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1767	1702		1767	1856	1530	1838	1856	1785	1838	1856	1749
Queue Service	Time (g	g s), S		9.6	17.3		6.2	7.6	5.0	4.5	17.9	17.9	3.2	26.0	26.0
Cycle Queue C	learance	e Time (g₀), s		9.6	17.3		6.2	7.6	5.0	4.5	17.9	17.9	3.2	26.0	26.0
Green Ratio (g.	/C)			0.23	0.23		0.11	0.11	-	0.44	0.36	0.36	0.44	0.36	0.36
Capacity (c), v	/eh/h			402	387		196	206	_	257	677	651	310	671	632
Volume-to-Capa				0.528	0.865		0.643	0.77	3 0.519	0.580	0.645	0.645	0.345	0.851	0.852
Back of Queue	(Q), fl	t/In (95 th percentile)	186	295		125	171	86	86	294	279	60	423	394
Back of Queue	(Q), ve	eh/In (95 th percenti	le)	7.2	11.5		4.9	6.7	3.3	3.3	11.5	11.1	2.3	16.5	15.8
Queue Storage	Ratio (RQ) (95 th percent	ile)	1.02	0.00		1.09	0.00	0.75	0.86	0.00	0.00	0.50	0.00	0.00
Uniform Delay ((d 1), S	/veh		31.0	34.0		38.9	39.6	38.4	20.8	24.1	24.1	18.0	26.9	27.0
Incremental De	lay (d 2), s/veh		0.4	2.4		1.3	5.6	0.9	0.6	0.3	0.3	0.2	1.3	1.4
Initial Queue De	elay (d	з), s/veh		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/ve	eh		31.4	36.4		40.3	45.2	39.3	21.4	24.4	24.5	18.3	28.3	28.4
Level of Service	(LOS)			С	D		D	D	D	С	С	С	В	С	С
				34.5		С	42.1	1	D	24.0		С	27.4		С
Approach Delay						29	9.3						С		
Approach Delay Intersection Del															
Intersection Del	eulte				FB			MP			NB			SB	
Intersection Del		/108		2 24	EB	B	2.20	WB		2 44	NB	B	1.04	SB	B
Intersection Del	Score			2.31	\Box	B A	2.29	9	B A	2.11	\Box	B A	1.91	1	B A

Table 124. Pennsylvania Ave and JFK Rd Saturday 4-5PM HCS Existing Conditions

		HCS	Sigr	nalize	d Inte	ersect	ion R	esult	s Sun	nmary	,				
General Inform	nation								ntersec	tion Inf	ormatic	on		4 1 1	la la
Agency									Duration	, h	1.000		7	3+4	_
Analyst				Analys	sis Dat	e 2/15/2	024	1	Area Typ	e	Other	-	-5.		
Jurisdiction				Time F	eriod			F	PHF		1.00		*		=
Urban Street		John F Kennedy		Analys	sis Yea	r 2024		1	Analysis	Period	1> 12	:00	2		
Intersection		4-5pm Penn/JFK		File Na	ame	Interse	ection (l	Penn-J	FK).xus					ጎተት	
Project Descrip	tion												1	4144	14
Demand Inforr	nation				EB			WE	3		NB			SB	
Approach Move				L	Τ	R	1	T	R	1	T	R	1	ΤT	R
Demand (v), v				104	140		56	105	\rightarrow	115	579	-	90	486	85
Demand (V), V	CII/II			104	140	31	- 00	100	01	110	013	00	30	400	- 00
Signal Informa	tion				ΤŢ	JU.	T	Τ.						_	
Cycle, s	120.0	Reference Phase	2	1	7	R+2	, M	Ħ	R		1	\	<u> </u>	- ^ ∥	
Offset, s	0	Reference Point	End	Green	60	67.7	5.9	1.9	16.9	0.0		1	2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Yellow		4.0	4.0	0.0	4.0	0.0			stz	/	7
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	1.1	1.2	0.0	1.2	0.0		5	6	7	- ♦ ;
Timer Results				EBI	_	EBT	WB	L	WBT	NB		NBT	SBI	_	SBT
Assigned Phase	е			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	2.0		3.0	1.1		4.0	1.1		4.0
Phase Duration				13.0)	24.0	11.1		22.1	12.0)	72.7	12.1	1	72.8
Change Period	, (Y+R	c), S		5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Head	dway (I	MAH), s		3.1		3.2	3.1		3.2	3.1		0.0	3.1		0.0
Queue Clearan	ce Time	e (g s), s		8.0		18.1	5.7		8.2	4.9			5.6		
Green Extension	n Time	(ge), s		0.1		0.7	0.0		8.0	0.2		0.0	0.2		0.0
Phase Call Pro	bability			0.97	7	1.00	0.85	5	1.00	0.97	7		0.99	9	
Max Out Proba	bility			0.00		0.00	0.00		0.00	0.00			0.00)	
Movement Gro	oup Res	sults			EB			WB			NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move	ment			3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow I	Rate (v), veh/h		104	237		56	105	57	111	315	305	136	442	420
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1767	1728		1767	1856	1572	1838	1856	1789	1838	1856	1759
Queue Service				6.0	16.1		3.7	6.2	3.9	2.9	8.9	8.4	3.6	14.5	13.6
		e Time (<i>g</i> _c), s		6.0	16.1		3.7	6.2	3.9	2.9	8.9	8.4	3.6	14.5	13.6
Green Ratio (g	/C)			0.21	0.16		0.05	0.14	0.14	0.62	0.56	0.56	0.62	0.56	0.56
Capacity (c), v				289	271		87	262	222	447	1046	1009	572	1048	993
Volume-to-Capa	acity Ra	atio (X)		0.359	0.875		0.643	0.401	0.257	0.247	0.301	0.302	0.237	0.422	0.423
Back of Queue	(Q), f	t/In (95 th percentile)	120	295		79	132	70	54	163	144	67	234	203
Back of Queue	(Q), v	eh/ln (95 th percenti	le)	4.7	11.5		3.1	5.2	2.7	2.1	6.4	5.8	2.6	9.1	8.1
		RQ) (95 th percent	-	0.48	0.00		0.32	0.00	0.28	0.24	0.00	0.00	0.42	0.00	0.00
Uniform Delay	(d 1), s	/veh		40.4	49.4		56.0	46.9	45.9	11.0	10.7	10.0	10.0	12.4	11.3
Incremental De				0.3	3.7		3.0	0.4	0.2	0.1	0.7	0.7	0.1	1.0	1.0
Initial Queue De	elay (d	з), s/veh		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (40.6	53.1		59.0	47.3	46.2	11.1	11.4	10.7	10.0	13.4	12.3
Level of Service				D	D		Е	D	D	В	В	В	В	В	В
Approach Delay				49.3	3	D	50.0		D	11.1		В	12.5	5	В
Intersection De	lay, s/ve	eh / LOS				21	.1						С		
Multimodal Bo	eulte				EB			WB			NB			SB	
Multimodal Re		/108		2.24	$\overline{}$		2.04		B	2.00		D	4.00	_	
Pedestrian LOS				2.31	-	В	2.31	-	В	2.09	\rightarrow	В	1.90	-	В
Bicycle LOS So	ore / LC	75		1.05)	Α	0.88)	Α	1.11		Α	1.03		Α

Table 125. Pennsylvania Ave and JFK Rd Saturday 4-5PM HCS Existing Conditions Optimized

		1100	Joigi	MILE	a mile	. 3001	IOII K	Ju	lts Sun	aı y					
General Inforn	ation								Intersec	tion Inf				الطباطا	E U
	iauon										1.000		1	417	
Agency				Analus	io Doto	0/45/0	0004		Duration,						
Analyst					is Date	2/15/2	2024		Area Typ	e	Other				-
Jurisdiction				Time F					PHF		1.00		4		-
Urban Street		John F Kennedy			is Year	_			Analysis		1> 12	:00	-5		
Intersection		4-5pm Penn/JFK		File Na	ame	Inters	ection (I	Penn-	JFK)_Ove	erall_De	lay.xus			117	
Project Descrip	tion													4147	PIT
Demand Inforr	nation				EB			W	В		NB			SB	
Approach Move	ement			L	Т	R	L	T	R	L	Т	R	L	T	R
Demand (v), v	eh/h			104	140	97	56	10	57	115	579	65	90	486	85
						1 111	1 11:								
Signal Informa		D (D)			7	217	215	La	\succeq					ا بر	-5-
Cycle, s	66.3	Reference Phase	2		5	1		rR	E] 1	2	3	
Offset, s	0	Reference Point	End	Green	6.1	0.3	18.1	9.8	3 11.4	0.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	4.0		0.0	_ `	Y	Φ		
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	2 1.1	0.0		5	6	7	Y
Timer Results				EBL		EBT	WB		WBT	NBI		NBT	SBI		SBT
Assigned Phase	ρ			EBI		8	WB	-	4	1		6	5	-	2
						10.0		_	9.0	1.1		4.0	1.1		4.0
Case Number	ase Duration, s				-		-	\rightarrow		-			_	-	
					_	16.5	_	\rightarrow	15.0	11.3	-	23.2	11.6	-	23.5
	ange Period, (Y+R o), s				-	5.1	-	\rightarrow	5.2	5.2	-	5.1	5.2	_	5.1
Max Allow Head					-	3.2		\rightarrow	3.1	3.1	_	3.1	3.1	$\overline{}$	3.1
Queue Clearan					_	10.7		+	5.4	4.7		11.9	5.3	_	17.0
Green Extension		(g e), S		_	\rightarrow	0.6	_	\rightarrow	0.4	0.2		1.3	0.2	_	1.3
Phase Call Pro				-	-	1.00	-	\rightarrow	0.98	0.87	_	1.00	0.92	_	1.00
Max Out Proba	DIIITY					0.00		_	0.00	0.00)	0.99	0.00	_	0.33
Movement Gro	up Res	sults			EB			WE	3		NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move	ment			3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow I	Rate (v), veh/h		104	237		56	105	57	111	315	305	136	442	420
		ow Rate (s), veh/h/l	ln	1767	1728		1767	185	6 1572	1838	1856	1789	1838	1856	1759
Queue Service				3.4	8.7		1.8	3.4	_	2.7	9.8	9.9	3.3	15.0	15.0
		e Time (<i>g</i> _e), s		3.4	8.7		1.8	3.4		2.7	9.8	9.9	3.3	15.0	15.0
Green Ratio (g		,		0.17	0.17		0.15	0.15	_	0.36	0.27	0.27	0.37	0.28	0.28
Capacity (c), v				303	297		262	275	_	292	506	488	390	515	489
Volume-to-Cap		atio (X)		0.343	0.799		0.214	-	_	0.379	0.622	0.625	0.349	0.858	0.85
		t/In (95 th percentile	:)	63	161		34	66		47	180	172	58	233	219
		eh/In (95 th percent	_	2.5	6.3		1.3	2.6	_	1.8	7.0	6.9	2.3	9.1	8.7
		RQ) (95 th percent		0.25	0.00		0.14	0.00	_	0.21	0.00	0.00	0.36	0.00	0.00
Uniform Delay			,	24.2	26.4		24.9	25.5		16.6	21.1	21.1	15.1	22.7	22.7
Incremental De				0.2	1.9		0.2	0.3	_	0.2	1.4	1.5	0.1	3.0	3.2
Initial Queue De				0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (24.4	28.3		25.0	25.8	_	16.9	22.5	22.6	15.2	25.7	25.9
Level of Service				C	C		C	C	C	В	C	C	B	C	C
Approach Delay				27.1		С	25.5		С	21.7		С	24.4		С
Intersection De				27.1			1.0			21.7			C		
	.,,														
Multimodal Re	sults				EB			WE	3		NB			SB	
	destrian LOS Score / LOS					В	2.28	o T	В	2.10		В	1.91		В
Pedestrian LOS	Score	/LOS		2.30		ь	2.20	•	ь	2.10		ь	1.5		

Table 126. Pennsylvania Ave and JFK Rd Saturday 4-5PM HCS 5-yr projected Conditions Optimized

		HCS	Sigr	ialize	a Inte	rsect	ion R	esult	ts Sun	ımary					
•	4.													الطيابالجار	E/III
General Inforn	nation							\rightarrow	Intersec		_		- 6	41,	
Agency						T		\rightarrow	Duration,		1.000				
Analyst					sis Date	2/15/2	2024	$\overline{}$	Area Typ	е	Other				•
Jurisdiction				Time F		-			PHF		1.00		- F		-
Urban Street		John F Kennedy		_	is Year	-			Analysis		1> 12		7		
Intersection		4-5pm Penn/JFK		File Na	ame	Inters	ection (F	Penn-J	IFK)_Ove	erall_De	lay_5yr	xus		<u> ጎተት</u>	
Project Descrip	tion		_	_	_	_	_	_		_	_	_		14144	PIN.
Demand Inform	mation				EB			WE	3		NB			SB	
Approach Move	ement				Т	T R		Тт	R		Тт	R		Т	TR
Demand (v), v				110	148	102	60	116	\rightarrow	121	609	68	95	513	10
														بحف	
Signal Informa	1	I = .			7	217		2	\equiv					,	4
Cycle, s	71.6	Reference Phase	2		5		":↑	7 R	2) "	2	3	
Offset, s	0	Reference Point	End	Green	6.2	0.3	21.7	9.9	12.8	0.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	_	0.0	4.0	4.0	4.0	0.0	_ \	Y	Φ	<u></u>	
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	1.1	0.0		5	6	7	Y
Timer Results				EBI		EBT	WB		WBT	NBI		NBT	SBI		SBT
Assigned Phas	e			LDI		8	VVD	-	4	1		6	5	-	2
Case Number					-	10.0		\neg	9.0	1.1		4.0	1.1		4.0
Phase Duration	1. S				-	17.9		\neg	15.1	11.4		26.8	11.8	-	27.2
	ase Duration, s ange Period, (Y+R o), s				\rightarrow	5.1		\rightarrow	5.2	5.2	\rightarrow	5.1	5.2	-	5.1
Max Allow Hea				-	_	3.2	_	\neg	3.1	3.1	_	3.1	3.1	_	3.1
Queue Clearan					\rightarrow	12.0		\rightarrow	6.1	4.8	\rightarrow	12.3	5.6	-	18.7
Green Extension					-	0.7		\rightarrow	0.3	0.2	_	3.1	0.3	_	3.2
Phase Call Pro		(3-71-			$\overline{}$	1.00		\rightarrow	0.99	0.89	$\overline{}$	1.00	0.94	$\overline{}$	1.00
Max Out Proba						0.00		\neg	0.01	0.00		0.01	0.00	5	0.00
Movement Gro		sults			EB			WB			NB			SB	
Approach Move				L	T	R	L	T	R	L	T	R	L	Т	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow		**		110	250		60	116	63	111	315	305	141	468	44
		ow Rate (s), veh/h/l	n	1767	1722		1767	1856	_	1838	1856	1790	1838	1856	175
Queue Service		-		3.9	10.0		2.2	4.1	2.6	2.8	10.2	10.3	3.6	16.7	16.
		e Time (g c), s		3.9	10.0		2.2	4.1	2.6	2.8	10.2	10.3	3.6	16.7	16.
Green Ratio (g				0.18	0.18		0.14	0.14	_	0.39	0.30	0.30	0.40	0.31	0.3
Capacity (c), v		tie (M)		317	308		244	256	215	292	564	544	405	573	54
Volume-to-Cap				0.347	0.810		0.246		_	0.379	0.558	0.560	0.348	0.816	0.8
		t/In (95 th percentile		73	187		41	82	43	50	183	174	63	249	23
		eh/ln (95 th percent		0.40	7.3 0.00		1.6	3.2	1.7	1.9	7.1	7.0	2.5	9.7	9.3
		RQ) (95 th percent	iiie)	25.8	28.3		0.36 27.6	0.00 28.5	_	0.50 17.0	0.00 21.0	0.00 21.0	0.53	0.00	22.
Uniform Delay Incremental De				0.2	2.0		0.2	0.5	0.3	0.2	0.3	0.3	15.1 0.1	0.5	0.6
Initial Queue D				0.2	0.0		0.2	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.
Control Delay (26.1	30.3		27.8	28.9	_	17.2	21.2	21.3	15.1	23.5	23.
Level of Service				C	C		C	C	C	В	C	C	В	C	C
Approach Dela				29.0		С	28.4		С	20.6		С	22.4		С
				20.0			3.5			20.0			C		
Intersection De															
Intersection De		timodal Results						WB			NB			SB	
Intersection De		/LOS		2.30	EB	В	2.29		В	2.10		В	1.91		В

Table 127. Pennsylvania Ave and JFK Rd Saturday 4-5PM HCS 10-yr projected Conditions Optimized

General Informa	ation							\neg	Intersect	tion Inf	ormatio	on	1 4	4 사사 1	Ja lu
Agency									Duration,	h	1.000)		411	
Analyst				Analys	is Date	2/15/2	024		Area Typ	e	Other				
Jurisdiction				Time F				\rightarrow	PHF		1.00				÷
Urban Street		John F Kennedy			is Year	2024		\rightarrow	Analysis	Period	1> 12	-00	7		•
Intersection		4-5pm Penn/JFK		File Na		-	ection (F		JFK) Ove					K+4	_
Project Description	on	4 opin i ciniioi ic		T IIC IN	anne	Inters	i) monoc	Cilii c	// K)_OV	Juli_DC	iuy_10	ri.xu5	7	1 1 to 1	7 4
Demand Informa	ation				EB			WE	3		NB			SB	
Approach Moven	nent			L	Т	R	L	T	R	L	T	R	L	T	R
Demand (v), vel	h/h			116	156	107	63	122	2 66	127	642	72	99	539	10
Signal Informati	ion				T U										5.
	74.6	Reference Phase	2	1	E	EΨ2			月				<u> </u>	⋰	4
Offset, s	0	Reference Point	End		1	1	1:7					1	2	3	
	Yes	Simult. Gap E/W	On	Green	-	0.2	23.6	10.0			–⊫l		-4-	_	_
	Fixed	Simult. Gap N/S	On	Yellow Red	1.2	0.0	1.1	1.2	1.1	0.0		Y 5	Y	7	➾
orce mode	incu	Omituit. Oap 14/3	OII	IXCU	1.2	10.0	11.1	1.2	11.1	10.0					
Timer Results				EBI	-	EBT	WB	L	WBT	NBI		NBT	SBI		SBT
Assigned Phase						8			4	1		6	5		2
Case Number						10.0			9.0	1.1		4.0	1.1		4.0
Phase Duration,	s					18.9			15.2	11.7	,	28.7	11.9	9	29.0
Change Period, ((Y+R	c), S				5.1		\neg	5.2	5.2		5.1	5.2		5.1
Max Allow Heady	vav (A	лАН). s			\neg	3.2		\neg	3.1	3.1	\neg	3.1	3.1	\neg	3.1
Queue Clearance					\rightarrow	13.0		\neg	6.6	5.2	\rightarrow	13.8	5.9	$\overline{}$	20.3
Green Extension					_	0.7		-	0.5	0.1	-	3.2	0.3	_	3.5
Phase Call Proba		(3-7,-				1.00		\neg	0.99	0.92	-	1.00	0.95	-	1.00
Max Out Probabi					-	0.00		\top	0.00	0.00	-	0.09	0.00	-	0.01
Movement Grou	ıp Res	ults			EB			WB			NB	,		SB	
Approach Moven	nent			L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movem	nent			3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Ra	ate (v), veh/h		116	263		63	122	66	122	348	336	147	491	460
Adjusted Saturat	ion Flo	w Rate (s), veh/h/l	n	1767	1720		1767	1856	1548	1838	1856	1789	1838	1856	175
Queue Service T	ime (g	ງ s), S		4.3	11.0		2.4	4.6	2.9	3.2	11.8	11.8	3.9	18.3	18.
Cycle Queue Cle	earance	e Time (<i>g</i> _c), s		4.3	11.0		2.4	4.6	2.9	3.2	11.8	11.8	3.9	18.3	18.
Green Ratio (g/0	C)			0.18	0.18		0.13	0.13	0.13	0.40	0.32	0.32	0.41	0.32	0.3
Capacity (c), ve	h/h			327	318		235	247	206	285	589	568	386	594	560
Volume-to-Capac	city Ra	tio (X)		0.355	0.826		0.268	0.494	0.320	0.427	0.591	0.593	0.380	0.827	0.82
Back of Queue (Q), ft	/In (95 th percentile)	80	204		46	91	48	56	203	193	68	269	250
Back of Queue (Q), ve	eh/In (95 th percenti	le)	3.1	7.9		1.8	3.6	1.9	2.2	7.9	7.7	2.7	10.5	10.
Queue Storage F	Ratio (RQ) (95 th percent	ile)	0.44	0.00		0.40	0.00	0.42	0.57	0.00	0.00	0.57	0.00	0.0
Uniform Delay (d	d 1), s/	/veh		26.6	29.3		29.1	30.1	29.4	17.6	21.5	21.5	15.4	23.5	23.
Incremental Dela	y (d 2), s/veh		0.2	2.1		0.2	0.6	0.3	0.3	0.3	0.3	0.1	0.5	0.6
Initial Queue Del	ay (d	з), s/veh		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d				26.8	31.5		29.4	30.7	29.7	17.8	21.7	21.8	15.6	24.1	24.
Level of Service				С	С		С	С	С	В	С	С	В	С	С
Approach Delay,				30.1		С	30.1	i	С	21.2	2	С	22.9		С
Intersection Dela							1.1						С		
Multimodal Res					EB			WB			NB			SB	_
Pedestrian LOS	Score.	/ LOS		2.30	1	В	2.29	1	В	2.10)	В	1.91		В

Table 128. Pennsylvania Ave and JFK Rd Saturday 4-5PM HCS 20-yr projected Conditions Optimized

		HCS	Sigr	nalize	d Inte	rsect	ion R	esult	s Sum	ımary					
General Inforn	nation							\rightarrow	ntersec		_		- i	411	ا ما
Agency								$\overline{}$	Duration,		1.000		-		
Analyst					is Date	2/15/2	024	$\overline{}$	Area Typ	е	Other		-to		-
Jurisdiction				Time F					PHF		1.00		*		÷
Urban Street		John F Kennedy		Analys	is Year	2024		/	Analysis	Period	1> 12	:00	70		
Intersection		4-5pm Penn/JFK		File Na	ame	Interse	ection (F	Penn-J	FK)_Ove	erall_De	lay_20y	r.xus/		ጎተት	
Project Descrip	tion													4144	7 4
Demand Inform	nation				EB			WE	R		NB			SB	
Approach Move					Τ	R	1	T	R	1	T	R	1	T	R
Demand (v), v				128	172	118	70	134	_	140	709	79	110	595	110
Demand (V), V	CII/II			120	112	110	10	104	10	140	703	13	110	000	110
Signal Informa	tion				ΤŢ			Τ.	2	\top					厶
Cycle, s	83.1	Reference Phase	2		- N		5:1	z ≓	2			\ 4	<u> </u>		
Offset, s	0	Reference Point	End	Green	6.7	0.2	28.9	10.0	16.7	0.0			2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	4.0	4.0	0.0			SŽ2	_	7
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	1.1	0.0		5	6	7	<u>-∻</u>
Timer Results				EBI	-	EBT	WB	L	WBT	NBI	_	NBT	SBI	-	SBT
Assigned Phas	e			<u> </u>	_	8	<u> </u>	+	4	1	_	6	5	_	2
Case Number				<u> </u>	-	10.0	<u> </u>	+	9.0	1.1	$\overline{}$	4.0	1.1	_	4.0
	ase Duration, s			_	-	21.8	_	+	15.2	11.9	-	34.0	12.1	-	34.1
Change Period		,,		_	_	5.1	_	-	5.2	5.2	-	5.1	5.2	_	5.1
Max Allow Hea				_	\rightarrow	3.2	_	+	3.2	3.1	\rightarrow	3.1	3.1	\rightarrow	3.1
Queue Clearan					_	15.6		_	7.8	5.8	-	16.3	6.6	_	24.5
Green Extension		(g e), S			\rightarrow	0.8		\perp	0.5	0.2	-	4.1	0.3	_	4.0
Phase Call Pro				_	-	1.00	_	_	1.00	0.96	-	1.00	0.98	_	1.00
Max Out Proba	bility			_		0.00	_		0.00	0.00		0.00	0.00)	0.01
Movement Gro	un Res	ults			EB			WB			NB			SB	
Approach Move	_	Juits		L	T	R	L	T	R	L	T	R		T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow) veh/h		128	290	10	70	134	73	134	385	372	163	543	512
		ow Rate (s), veh/h/l	n	1767	1717		1767	1856	_	1838	1856	1790	1838	1856	175
Queue Service				5.2	13.6		3.1	5.8	3.7	3.8	14.3	14.3	4.6	22.5	22.
		e Time (g o), s		5.2	13.6		3.1	5.8	3.7	3.8	14.3	14.3	4.6	22.5	22.
Green Ratio (g		5 . Ano (g t), 5		0.20	0.20		0.12	0.12	0.12	0.43	0.35	0.35	0.44	0.35	0.3
Capacity (c), v				359	349		211	222	183	268	647	624	373	652	615
Volume-to-Cap		atio (X)		0.357	0.831		0.332	_	_	0.502	0.595	0.596	0.438	0.832	0.83
		t/In (95 th percentile)	100	243		59	119	63	69	240	228	82	318	296
		eh/In (95 th percenti	•	3.9	9.5		2.3	4.6	2.4	2.7	9.4	9.1	3.2	12.4	11.
		RQ) (95 th percent		0.55	0.00		0.52	0.00		0.69	0.00	0.00	0.68	0.00	0.0
Uniform Delay				28.8	32.1		33.9	35.1	34.2	19.2	22.5	22.5	16.3	25.0	25.
Incremental De				0.2	2.0		0.3	1.0	0.5	0.4	0.2	0.3	0.1	0.4	0.5
		з), s/veh		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IIIIllai Queue D				29.0	34.1		34.2	36.1	34.7	19.6	22.7	22.7	16.5	25.4	25.
Control Delay (С	С		С	D	С	В	С	С	В	С	С
Control Delay (. /			32.5		С	35.3		D	22.3		С	24.2		С
	y, s/veh					25	5.9						С		
Control Delay (Level of Service Approach Dela									_						
Control Delay (Level of Service Approach Dela Intersection De	lay, s/ve														
Control Delay (Level of Service Approach Dela Intersection De Multimodal Re	lay, s/ve	eh / LOS			EB			WB			NB			SB	
Control Delay (Level of Service Approach Dela Intersection De	lay, s/ve sults S Score	h/LOS /LOS		2.31	工	B A	2.29		B A	2.10		B A	1.91	\Box	В

Table 129. Pennsylvania Ave and JFK Rd Saturday 5-6PM HCS Existing Conditions

		Table 129. Penns										litions			
		HCS	Sigr	nalize	d Int	ersect	tion R	esul	ts Sun	nmary	<u>' </u>				
0	4:								I-4	4: 1 5	4:			4 사사	WHI
General Inform	nation							_	Intersec		_		- i	ATT.	1. r
Agency									Duration	, h	1.000		-		
Analyst						e 2/15/2	2024		Area Typ	e	Other	•			
Jurisdiction				Time F	Period				PHF		1.00		_ ₹ ₹		- ;-
Urban Street		John F Kennedy		Analys	sis Yea	\rightarrow			Analysis	Period	1> 12	:00	2 2		
Intersection		5-6pm Penn/JFK		File Na	ame	Inters	ection (Penn-	JFK).xus					ጎተት	
Project Descrip	tion												1	4144	11
Demand Infor	mation				EB			W	В		NB			SB	
Approach Move					Т	R	1	T	_	1	T	T R	1	T	R
Demand (v), v				105	183	-	-	11	-	125	563	93	77	511	91
Belliana (v),	CINII			100	100	100	- 00		7 02	120	000	- 50		011	
Signal Informa	ation				Τζ		111	T.		<u> </u>	5			_	5
Cycle, s	120.0	Reference Phase	2		R	51		, [6			\ 4	<u> </u>		
Offset, s	0	Reference Point	End	Green	6.8	0.1	58.5	7.3	0.3	26.4		1	2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Yellow		0.0	4.0	4.0	-	4.0	<u> </u>		stz	/	7
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2		1.1		5	6	7	- ♦-
Timer Results				EBI	-	EBT	WB	L	WBT	NB	L	NBT	SBI	L	SBT
Assigned Phas	е			3		8	7		4	1		6	5		2
Case Number				1.1		4.0	2.0		3.0	1.1		4.0	1.1		4.0
Phase Duration	ase Duration, s			12.5	5	31.5	12.8	В	31.8	12.1	1	63.8	12.0)	63.6
Change Period	, (Y+R	c), S		5.2		5.2	5.2		5.2	5.2		5.1	5.2		5.1
Max Allow Hea	dway (I	<i>МАН</i>), s		3.1		3.2	3.1		3.2	3.1		0.0	3.1		0.0
Queue Clearan	ice Time	e (gs), s		7.5		25.4	8.0		8.1	6.0			5.2		
Green Extension	n Time	(ge), S		0.1		0.9	0.1		1.0	0.2		0.0	0.1		0.0
Phase Call Pro	bability			0.97	7	1.00	0.9	5	1.00	0.98	3		0.96	6	
Max Out Proba	bility			0.00		0.01	0.00	0	0.00	0.00)		0.00)	
Movement Gro	nun Res	ults			EB			WB			NB			SB	
Approach Move		Juits		L	Т	T R	1	Τ	R	L	Т	R	L	Т	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow) veh/h		105	342	10	89	114	_	125	335	321	101	403	383
		ow Rate (s), veh/h/l	n	1767	1712	+	1767	1856	_	1838	1856	1763	1838	1856	1757
Queue Service				5.5	23.4		6.0	6.1	_	4.0	13.5	13.6	3.2	12.9	11.9
		g ଛ), s e Time (g ₀), s		5.5	23.4		6.0	6.1	3.8	4.0	13.5	13.6	3.2	12.9	11.9
Green Ratio (5 .ano (g t), 5		0.28	0.22		0.06	0.22	_	0.55	0.49	0.49	0.54	0.49	0.49
Capacity (c),				363	375	+	112	411	_	435	907	862	451	905	857
Volume-to-Cap		atio (X)		0.289	0.912		0.793	0.27		0.287	0.370	0.372	0.223	0.446	0.447
		t/In (95 th percentile)	108	436		128	128		75	256	242	62	212	182
		eh/In (95 th percenti		4.2	17.0		5.0	5.0	_	2.9	10.0	9.7	2.4	8.3	7.3
		RQ) (95 th percent		0.43	0.00		0.51	0.00	-	0.33	0.00	0.00	0.39	0.00	0.00
Uniform Delay			nc)	33.3	45.7	-	55.4	38.8	$\overline{}$	14.2	19.1	19.2	15.0	13.1	11.6
Incremental De				0.2	16.0	-	4.9	0.1		0.1	1.2	1.2	0.1	1.4	1.5
Initial Queue D				0.0	0.0		0.0	0.0	_	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (33.5	61.7		60.3	38.9	_	14.3	20.3	20.4	15.1	14.5	13.1
Level of Service				C	E		E	D D	D D	B	20.3	C C	B	B	B
				55.1		E	45.9	-	D	19.4		В	13.9		В
Approach Dela Intersection De	•			33.1			7.0	,	U	19.4	•		C 13.3	, L	D
miersection De	iay, 5/VE	317 LU3					1.0								
Multimodal Re	sults				EB			WE	3		NB			SB	
Pedestrian LOS		/ LOS		2.30		В	2.30	o T	В	2.10		В	1.91	1	В
	core / LC			1.23	-	Α	0.92	-	Α	1.13	-	Α	1.05	_	Α

Table 130. Pennsylvania Ave and JFK Rd Saturday 5-6PM HCS Existing Conditions Optimized

				nalize						į					
General Inform	nation								Intersec	tion Inf	ormatic	n		4444	Ja lu
Agency									Duration	, h	1.000			411	
Analyst				Analys	sis Date	2/15/2	024		Area Typ		Other				
Jurisdiction				Time F					PHF		1.00		-		+
Urban Street		John F Kennedy		_	sis Year	2024			Analysis	Period	1> 12	:00	구		•
Intersection		5-6pm Penn/JFK		File Na		+	ection (F	Penn-	JFK)_Ove					K+4	
Project Descrip	tion	o opini onimor it		1 110 111	41110	Intoro	1) 1101100	01111	o, ,,,_o,,	D	nay.nao		- 5	1144	t= 1"
							,			,					
Demand Inform					EB		+	W		+	NB		+	SB	
Approach Move				L	T	R	L	T	_	L	T	R	L	T	R
Demand (v), v	eh/h		_	105	183	159	89	11	4 62	125	563	93	77	511	91
Signal Informa	tion				T U.	Т		Т	<u></u>	$\overline{}$	_				-5.
Cycle, s	72.3	Reference Phase	2	1	N	E.A.		" ≓	Ħ				<u> </u>	⋰	1
Offset, s	0	Reference Point	End		()	STI		_		1.5		1	2	3	
Uncoordinated	Yes	Simult. Gap E/W	On	Green Yellow	-	0.4	18.6 4.0	4.0	$\overline{}$	0.0	_ Լ		r1-	_	
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	-	0.0		5	Y 6	7	- \$
Timer Results				EBI	-	EBT	WB	L	WBT	NBI	-	NBT	SBI	-	SBT
Assigned Phase	е					8		_	4	1		6	5		2
Case Number						10.0		4	9.0	1.1		4.0	1.1		4.0
Phase Duration	, S					21.8		\perp	15.2	11.6	5	24.1	11.3	3	23.7
Change Period,	(Y+R	c), S				5.1		_	5.2	5.2		5.1	5.2		5.1
Max Allow Head	dway (I	<i>MAH</i>), s				3.2		_	3.1	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	e (gs), s				15.9		_	6.1	5.5		13.9	4.8		17.0
Green Extensio	n Time	(ge), S				0.8		_	0.5	0.1		0.5	0.2		1.6
Phase Call Prol	bability					1.00			1.00	0.92	2	1.00	0.87	7	1.00
Max Out Proba	bility				(0.00		_	0.00	0.00		1.00	0.00		0.01
Movement Gro	up Res	sults			EB			WE			NB			SB	
Approach Move	-			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow F), veh/h		105	342		89	114	62	125	335	321	101	403	383
		ow Rate (s), veh/h/l	n	1767	1712		1767	1856		1838	1856	1763	1838	1856	175
Queue Service				3.5	13.9		3.3	4.1	2.6	3.5	11.8	11.9	2.8	14.9	15.
Cycle Queue C				3.5	13.9		3.3	4.1	2.6	3.5	11.8	11.9	2.8	14.9	15.
Green Ratio (g				0.23	0.23		0.14	0.14	0.14	0.35	0.26	0.26	0.34	0.26	0.2
Capacity (c), v	<u> </u>			409	396		243	255	216	299	487	463	311	478	453
Volume-to-Capa		ntio (X)		0.257	0.863		0.366	0.44	_	0.418	0.689	0.693	0.323	0.844	0.84
		t/ln (95 th percentile)	64	240		63	81	43	63	231	219	50	231	210
		eh/ln (95 th percenti	,	2.5	9.4		2.4	3.2	1.7	2.5	9.0	8.8	2.0	9.0	8.6
		RQ) (95 th percent		0.26	0.00		0.25	0.00		0.27	0.00	0.00	0.31	0.00	0.0
Uniform Delay (22.7	26.7		28.4	28.7	_	18.5	24.0	24.1	18.0	25.5	25.
Incremental De	. ,.			0.1	2.3		0.3	0.5	_	0.3	3.5	3.8	0.1	0.8	0.8
Initial Queue De				0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (22.9	29.0		28.7	29.1	28.3	18.8	27.5	27.8	18.1	26.3	26.
Level of Service	(LOS)			С	С		С	С	С	В	С	С	В	С	С
Approach Delay				27.6		С	28.8	3	С	26.3	3	С	25.4	1	С
Intersection De							5.5						С		
Multimodal Re					EB	_		WE			NB			SB	
Pedestrian LOS				2.30	-	В	2.28	\rightarrow	В	2.11	\rightarrow	В	1.92	-	В
	estrian LOS Score / LOS cle LOS Score / LOS				3	Α	0.92		Α	1.13		Α	1.05		Α

Table 131. Pennsylvania Ave and JFK Rd Saturday 5-6PM HCS 5-yr projected Conditions Optimized

		1,00	- Oigi			. 5566		Jour	ts Sun	ui y					
General Inform	ation								Intersec	tion Info	ormatic	on.	l J	الطلطا	ja lij
Agency	iuuon							\rightarrow	Duration.		1.000			417	
Analyst				Analys	is Date	2/15/2	024	\rightarrow	Area Typ	<u> </u>	Other				
Jurisdiction				Time F		2/10/2	024	$\overline{}$	PHF		1.00		→ ->		K.
Urban Street		John F Kennedy			is Year	2024		\rightarrow	Analysis	Period	1> 12	-00	-E		
Intersection		5-6pm Penn/JFK		File Na		+	ection (F	_	JFK) Ove						
Project Descrip	tion	o opini i ciniioi ik		T IIC TW	anic	Interse	oction (i	Cilii	// N/_OV	Juli_DC	idy_Oyi	.Au3		4147	7 4
roject Decemp															
Demand Inform	nation				EB			WE	3	Т	NB			SB	
Approach Move	ment			L	Т	R	L	T	R	L	T	R	L	T	F
Demand (v), v	eh/h			105	183	159	89	114	4 62	125	563	93	77	511	9
							1 111								
Signal Informa					6		1215	12	Ħ					,	4
Cycle, s	75.9	Reference Phase	2		5	517	" <u>"</u>	r R	2			1 -1	2	3	
Offset, s	0	Reference Point	End	Green	6.3	0.3	21.2	10.	0 17.6	0.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	_	0.0	4.0	4.0	-	0.0		Y	Φ	<u></u>	
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	1.1	0.0		5	6	7	Z
Time - December				EDI	_	EDT	MD	_	WDT	NIDI	_	NDT	ODI		ODT
Timer Results	2			EBI	-	EBT 8	WB	_	WBT 4	NBI 1		NBT 6	SBI 5	-	SBT 2
Assigned Phase	=			\vdash		10.0		+	9.0	1.1	-	4.0	1.1	_	4.0
Case Number				-	-			-		-			_	-	
Phase Duration	ange Period, (Y+R o), s			_		22.7		_	15.2	11.7		26.6	11.5	_	26.3
					-	5.1	-	-	5.2	5.2	-	5.1	5.2	_	5.1
	x Allow Headway (MAH), s eue Clearance Time (q s), s			_		3.2		_	3.1	3.1	_	3.1	3.1	$\overline{}$	3.1
		10 /		_		16.6 0.8		-	6.3 0.4	5.5 0.2	-	3.0	4.9 0.2	_	18.0 3.0
Green Extensio		(g e), S		\vdash			-	_		_			_	_	
Phase Call Prob				_	-	1.00 0.00		-	0.00	0.93	-	1.00	0.89		1.00
Max Out Probal	Dility					0.00		_	0.00	0.00		0.01	0.00	_	0.00
Movement Gro	up Res	ults			EB			WB			NB			SB	
Approach Move	•			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow F), veh/h		105	342		89	114	62	125	335	321	105	420	39
		ow Rate (s), veh/h/l	n	1767	1712		1767	1856	1572	1838	1856	1763	1838	1856	175
Queue Service				3.7	14.6		3.5	4.3	2.7	3.5	12.0	12.1	2.9	16.0	16
Cycle Queue C		, ,·		3.7	14.6		3.5	4.3	2.7	3.5	12.0	12.1	2.9	16.0	16
Green Ratio (g		10 //		0.23	0.23		0.13	0.13		0.37	0.28	0.28	0.36	0.28	0.2
Capacity (c), v				410	398		231	243	206	301	527	501	328	521	49
Volume-to-Capa		tio (X)		0.256	0.860		0.385	0.469	0.301	0.415	0.637	0.640	0.319	0.806	0.8
		t/ln (95 th percentile)	68	252		67	87	46	65	222	210	53	250	23
		eh/ln (95 th percenti		2.7	9.8		2.6	3.4	1.8	2.5	8.7	8.4	2.1	9.7	9.
		RQ) (95 th percent		0.37	0.00		0.58	0.00	_	0.65	0.00	0.00	0.44	0.00	0.0
Uniform Delay (23.9	28.1		30.3	30.6	29.9	18.4	23.8	23.9	17.8	25.5	25
Incremental De	lay (d 2), s/veh		0.1	2.2		0.4	0.5	0.3	0.3	0.5	0.5	0.1	0.6	0.
Initial Queue De	tial Queue Delay (d 3), s/veh			0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Control Delay (ontrol Delay (d), s/veh			24.0	30.3		30.7	31.2	30.2	18.8	24.3	24.4	17.9	26.1	26
Level of Service	vel of Service (LOS)			С	С		С	С	С	В	С	С	В	С	C
Approach Delay	, s/veh	/LOS		28.8	3	С	30.8	3	С	23.5		С	25.2	2	С
Intersection Del						25	5.9						С		
	ultimodal Results				EB			WB			NB			SB	
Multimodal Re	edestrian LOS Score / LOS														
		/ LOS		2.30)	В	2.28	3	В	2.11		В	1.92	2	В

Table 132. Pennsylvania Ave and JFK Rd Saturday 5-6PM HCS 10-yr projected Conditions Optimized

		HCS	Sigr	nalize	d Inte	ersec	tion R	esul	ts Sun	nmary					
General Inforn	nation	1						_	Intersec		-		- i	111 1474	Ja L
Agency									Duration		1.000		-		
Analyst						e 2/15/	2024		Area Typ	e	Other				•_
Jurisdiction				Time F		+			PHF		1.00		_ ₹ →		÷.
Urban Street		John F Kennedy			sis Yea	-			Analysis		1> 12		- 5		
Intersection		5-6pm Penn/JFK		File Na	ame	Inters	ection (Penn-	JFK)_Ov	erall_De	lay_10	yr.xus		111	
Project Descrip	tion		_	_	_	_	_	_	_	_	_	_		114Y	+ ^
Demand Inforr	nation				EB			W	В		NB			SB	
Approach Move	ement			L	Т	R	1	Т	R	1	Т	R	1	Т	R
Demand (v), v				116	202	176	98	12	6 68	138	622	103	85	564	10
Signal Informa					6			la	=					,	4
Cycle, s	80.8	Reference Phase	2		15	51	2 S1	z 🖹)	2		
Offset, s	0	Reference Point	End	Green	6.4	0.3	23.3	10.	.0 20.3	0.0		•			
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	-	0.0	4.0	4.0		0.0	_ `	~	V	✓.	↔
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	1.1	0.0		5	6	7	Y
Timer Results				EBI		EBT	WB	1	WBT	NBI		NBT	SBI		SBT
Assigned Phas	ρ			EBI		8	VVD	-	4	1	-	6	5	-	2
Case Number					\rightarrow	10.0		\rightarrow	9.0	1.1		4.0	1.1		4.0
Phase Duration	. s				+	25.4	_	\rightarrow	15.2	11.9	_	28.7	11.6	-	28.4
	ange Period, (Y+R ∘), s				\rightarrow	5.1	_	\rightarrow	5.2	5.2	-	5.1	5.2	_	5.1
	ange Penod, (Y+R o), s ax Allow Headway (MAH), s				\rightarrow	3.2	_	\rightarrow	3.1	3.1	_	3.1	3.1	-	3.1
	ax Allow Headway (MAH), s leue Clearance Time (g s), s					19.3			7.2	6.1		16.4	5.3	$\overline{}$	20.0
Green Extension				_	\rightarrow	0.9	_	\rightarrow	0.3	0.2	_	3.3	0.2	_	3.2
Phase Call Pro		(9-),-			\rightarrow	1.00		\rightarrow	1.00	0.96	\rightarrow	1.00	0.92	$\overline{}$	1.00
Max Out Proba					\neg	0.00		\neg	0.05	0.00	-	0.00	0.00	_	0.03
Movement Gro		ults			EB		-	WB			NB			SB	
Approach Move	ement			L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow				116	378		98	126	-	138	371	354	110	441	418
		ow Rate (s), veh/h/l	n	1767	1705	-	1767	1856	-	1838	1856	1763	1838	1856	175
Queue Service				4.3	17.3	-	4.2	5.2	_	4.1	14.3	14.4	3.3	18.0	18.
Cycle Queue C		e Time (<i>g</i> ₀), s		4.3	17.3	-	4.2	5.2	3.3	4.1	14.3	14.4	3.3	18.0	18.
Green Ratio (g				0.25	0.25		0.12	0.12	_	0.37	0.29	0.29	0.37	0.29	0.2
Capacity (c), v		Air (MC)		444	428	_	218	229		285	542	515 0.688	303	535	50
Volume-to-Cap			\	0.261	0.883		0.450	0.55	-	0.484	0.685		0.363	0.824	0.82
	V - 77	t/In (95 th percentile eh/In (95 th percenti		79 3.1	290 11.3	+	81 3.2	106 4.1	2.2	3.0	258 10.1	9.7	2.3	10.8	10.
				_	_	+	0.70	_	-	_				_	-
Uniform Delay		RQ) (95 th percent	iie)	0.44 24.3	29.2		32.9	33.4	-	0.77 19.8	0.00 25.4	0.00 25.4	0.50 19.1	0.00 26.9	0.0 26.
	· /·			0.1	2.5		0.5	0.8		0.5	0.6	0.6	0.1	0.7	0.7
	cremental Delay (d 2), s/veh			0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
	itial Queue Delay (d 3), s/veh ontrol Delay (d), s/veh			24.4	31.7		33.5	34.1	_	20.3	26.0	26.0	19.2	27.5	27.
	evel of Service (LOS)			C	C		C	C	C	C	C	C	B	C	C
Approach Dela				30.0		C	33.0		c	25.1		С	26.6		С
Intersection De	, .			30.0			7.5			20.			C 20.0		
	7, 2.7														
Multimodal Re	sults				EB			WB	1		NB			SB	
Pedestrian LOS	Score	/ LOS		2.31	1	В	2.28	8	В	2.11		В	1.92	2	В
T Cucstilair Eoc	edestrian LOS Score / LOS cycle LOS Score / LOS						0.97						1.11		

Table 133. Pennsylvania Ave and JFK Rd Saturday 5-6PM HCS 20-yr projected Conditions Optimized

		HCS	Sigr	ialize	a inte	rsect	ion R	esul	ts Sun	ımary					
General Inforn	nation							\rightarrow	Intersec		_		- i	111 4741	
Agency									Duration	, h	1.000)			
Analyst				Analys	is Date	2/15/2	024		Area Typ	e	Other				·-
Jurisdiction				Time F	Period				PHF		1.00		÷		÷-
Urban Street		John F Kennedy		Analys	is Year	2024			Analysis	Period	1> 12	2:00	70		
Intersection		5-6pm Penn/JFK		File Na	ame	Interse	ection (F	Penn-	JFK)_Ove	erall_De	lay_20	yr.xus		ጎተት	
Project Descrip	tion												T	4144	7 4
							Ţ			_					
Demand Inforr	mation				EB			WI	3		NB			SB	
Approach Move	ement			L	T	R	L	T	R	L	Т	R	L	Т	R
Demand (v), v	eh/h			128	223	194	109	13	9 76	153	687	113	94	624	111
				1											
Signal Informa	tion			l	7			2	Ħ					_	4
Cycle, s	91.2	Reference Phase	2		15	Sti	z 5:10	2 K	2			ነ . ጓ		- ∕` ,	
Offset, s	0	Reference Point	End	Green	6.7	0.5	28.5	10.	0 24.9	0.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	-	0.0	4.0	4.0	$\overline{}$	0.0			₩	/	
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.2	0.0	1.1	1.2	1.1	0.0		5	6	7	$\overline{\mathbf{A}}$
Timer Results				EBL	.	EBT	WB	L	WBT	NBI	-	NBT	SBI	L	SBT
Assigned Phas	е					8			4	1		6	5		2
Case Number						10.0		\neg	9.0	1.1		4.0	1.1		4.0
Phase Duration	ı, S					30.0		\neg	15.2	12.4		34.1	11.9	•	33.6
Change Period	(Y+R	c), S				5.1		\neg	5.2	5.2		5.1	5.2		5.1
	ax Allow Headway (<i>MAH</i>), s				\neg	3.2		\neg	3.2	3.1	\neg	3.1	3.1		3.1
	* * * * * * * * * * * * * * * * * * * *					23.6		\rightarrow	8.6	7.1		19.7	6.0	-	24.5
	eue Clearance Time ($g \circ$), s een Extension Time ($g \circ$), s					1.1		\rightarrow	0.6	0.3	-	3.7	0.2	_	3.8
Phase Call Pro		(9=), 5		_		1.00	_	\rightarrow	1.00	0.98	-	1.00	0.95	_	1.00
Max Out Proba					-	0.00	_	\rightarrow	0.00	0.00	-	0.03	0.00	-	0.01
Wax Out 1 100a	Dility					0.00			0.00	0.00		0.00	0.00	,	0.01
Movement Gro	oup Res	sults			EB			WB			NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow I) veh/h		128	417		109	139	_	153	410	390	121	488	462
		ow Rate (s), veh/h/l	n	1767	1703		1767	1856		1838	1856	1764	1838	1856	1757
Queue Service				5.2	21.6		5.4	6.6	4.3	5.1	17.7	17.7	4.0	22.5	22.5
Cycle Queue C				5.2	21.6		5.4	6.6	4.3	5.1	17.7	17.7	4.0	22.5	22.5
Green Ratio (g		e fille (g e), s		0.27	0.27		0.11	0.11	_	0.39	0.32	0.32	0.39	0.31	0.31
				484	466		193	203	_	266	592	563	287	581	550
Capacity (c), v		atio (V)		0.264	0.894		0.565	0.686	_	0.576	0.692	0.694	0.423	0.840	0.84
Volume-to-Cap			Λ	-				_	_	_	_	_	_	_	-
		t/In (95 th percentile		98	351		107	140		97	310	291	75	338	315
		eh/ln (95 th percenti		3.8	13.7		4.2	5.5	-	3.8	12.1	11.6	2.9	13.2	12.6
		RQ) (95 th percent	ille)	0.54	0.00		0.93	0.00	_	0.97	0.00	0.00	0.63	0.00	0.00
Uniform Delay				26.1	32.0		38.8	39.3		22.1	27.3	27.3	20.9	29.4	29.4
Incremental De		•		0.1	2.6		1.0	1.6	0.7	0.7	0.5	0.6	0.2	0.7	0.7
Initial Queue De				0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ontrol Delay (d), s/veh			26.2	34.6		39.7	40.9	39.0	22.9	27.8	27.9	21.1	30.0	30.0
Level of Service	e (LOS)			С	С		D	D	D	С	С	С	С	С	С
Approach Delay	y, s/veh	/ LOS		32.6		С	40.0)	D	27.0)	С	29.0)	С
Intersection De	lay, s/ve	eh / LOS				30).3						С		
Multimodal Re				L	EB		<u> </u>	WB			NB	_		SB	
Pedestrian LOS	Score	/ LOS		2.31		В	2.28	-	В	2.11	\rightarrow	В	1.92	2	В
	destrian LOS Score / LOS cycle LOS Score / LOS					Α	1.02		Α	1.27		Α	1.17		Α

Table 134. Wacker Dr and JFK Rd Saturday 11-12PM HCS Existing Conditions

			9.		-	ersect		-		-	u. y					
General Inforn	nation										ion Inf		n	- i	4741	
Agency						In contract			-	ration,		1.000				
Analyst				-		2/20/2	024		-	а Тур	e	Other				
Jurisdiction				Time F		+			PHI			1.00		- +		7
Urban Street				Analys	is Year	2024			Ana	alysis	Period	1> 12	:00			
Intersection		11am-12pm Wacke	r/JFK	File Na	ame	Interse	ection (\	Vac	cer-JF	FK)-0	ptimizat	ion.xus			ጎ † ት	
Project Descrip	tion							_	_	_				n	4 1 4 4	Pr In
Demand Inforr	nation				EB			V	VB			NB			SB	
Approach Move				1	ΤŢ	T R	1	_	T	R	L	T	R	L	T	T R
Demand (v), v				389	16	71	12	-	4	14	116	536	5	13	498	35
Demana (v), v	OTIVIT			000	10		12	Ė			110				400	
Signal Informa	tion				Ţ		125	Т	. 5_		\top					
Cycle, s	57.4	Reference Phase	2		R	517		,≓	; E	1			Y	Ψ		- ♦
Offset, s	0	Reference Point	End	Green	0.3	3.9	14.0	_	1.7	6.0	0.0		1	2	3	Y
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		0.0	4.0	3.		3.0	0.0				⋰	→
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.	5	2.5	0.0		5	6	7	
Timer Results				EBI	-	EBT	WBI	L	WI		NBI	-	NBT	SBI	-	SBT
Assigned Phas	е			\vdash	\perp	4		_	8	_	5		2	1	\perp	6
Case Number						10.0		_	12	2.0	1.1		4.0	1.1		4.0
	ase Duration, s ange Period, (Y+R o), s				_	17.2		_	11	-	9.2		23.4	5.3	\perp	19.5
	ange Period, (Y+R c), s				_	5.5		_	5.		5.0		5.5	5.0	_	5.5
Max Allow Hea	ax Allow Headway (<i>MAH</i>), s				_	3.2		_	3.	_	3.1		3.1	3.1	_	3.1
Queue Clearan	ce Time	e (g ₅), s			_	10.9		_	2.	.5	4.7		8.8	2.1		5.7
Green Extension	n Time	(g e), S		\vdash	\perp	8.0		_	0.	$\overline{}$	0.1		1.0	0.0	_	0.5
Phase Call Pro	bability				_	1.00		_	1.0	_	0.84	_	1.00	0.06	_	1.00
Max Out Proba	bility					0.03		_	0.0	00	0.00		0.25	0.01		0.00
Movement Gro	oup Res	ults			EB			W	B			NB			SB	
Approach Move	_			L	T	R	L	Т	_	R	L	T	R	L	T	R
Assigned Move				7	4	14	3	8	_	18	5	2	12	1	6	16
Adjusted Flow I) veh/h		195	282		16	_	\neg	14	116	271	270	4	136	127
· .		ow Rate (s), veh/h/l	n	1767	1721		1788		1	1576	1767	1856	1849	1767	1856	160
Queue Service				5.7	8.9		0.5		-	0.5	2.7	6.8	6.8	0.1	3.4	3.7
Cycle Queue C				5.7	8.9		0.5		-	0.5	2.7	6.8	6.8	0.1	3.4	3.7
Green Ratio (g		(0-7/-		0.20	0.20		0.10		_	0.10	0.33	0.31	0.31	0.25	0.24	0.2
Capacity (c), v				360	351		187		_	165	453	578	577	271	452	391
Volume-to-Cap		itio (X)		0.540	0.802		0.084		\rightarrow	0.086	0.256	0.468	0.469	0.015	0.301	0.32
		t/In (95 th percentile	:)	99	156		8			7	43	117	114	2	61	56
	· //	eh/ln (95 th percenti	,	3.9	6.1		0.3			0.3	1.7	4.6	4.5	0.1	2.4	2.3
		RQ) (95 th percent		0.20	0.31		0.19			0.17	0.09	0.23	0.23	0.00	0.12	0.1
Uniform Delay		, , , ,		20.5	21.8		23.2		\rightarrow	23.2	13.9	15.9	15.9	16.4	17.7	17.
	cremental Delay (d 2), s/veh			0.5	1.7		0.1		-	0.1	0.1	0.2	0.2	0.0	0.1	0.2
	itial Queue Delay (d 2), s/veh			0.0	0.0		0.0		\rightarrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ontrol Delay (d), s/veh			20.9	23.4		23.3		\rightarrow	23.3	14.0	16.1	16.1	16.4	17.9	18.
Level of Service				С	С		С			С	В	В	В	В	В	В
Approach Delay				22.4		С	23.3		C		15.8		В	17.9		В
Intersection De	lay, s/ve	h / LOS				18	3.5							В		
Multimodal Re	sults				EB			W	В			NB			SB	
Pedestrian LOS	Score	/ LOS		2.28	3	В	2.29		В	3	1.90		В	2.10)	В
Bicycle LOS So	ore / LC)S		1.27	,	Α	0.51		Д	4	1.03	3	Α	1.20)	Α

HCS™ Streets Version 2024

Generated: 4/16/2024 7:09:56 PM

Table 135. Wacker Dr and JFK Rd Saturday 11-12PM HCS Existing Conditions Optimized

	HCS	Sigr	alize	d Inte	rsect	ion R	esu	lts Sun	nmary	,				
General Information								Intersec	tion Inf	ormatic	n		411	Ja I _u
Agency								Duration	, h	1.000			* * *	
Analyst			Analys	is Date	2/20/2	2024		Area Typ	e	Other		-5- ->		,
Jurisdiction			Time F	Period				PHF		1.00		*		-
Urban Street			Analys	is Year	2024			Analysis	Period	1> 12	:00	70		
Intersection 11	1am-12pm Wacke	r/JFK	File Na	ame	Inters	ection (V	Vack	er-JFK)_(overall_l	Delay_E	xistin		5 ተ ት	Г
Project Description												1	4144	14
Demand Information				EB			V	/B		NB			SB	
Approach Movement			L	Т	R	L	Т	T R	L	Т	R	L	Т	R
Demand (v), veh/h			389	16	71	12	4	4 14	116	536	4	13	498	355
Signal Information				T U.			Т		Т	7				
	Reference Phase	2	1	K	E.A.		Æ	Ξ			×	D		↔
	Reference Point	End		()	51		_		-		1	2	3	Y 4
	Simult. Gap E/W	On	Green		0.5	15.0	12		0.0	_				~
	Simult. Gap N/S	On	Yellow Red	1.5	3.5 1.5	1.5	3.		0.0) 5 24	6	7	~
. s. se iniege Tined o	ait. Gup 1470	311	1100	,		1.0	14.	2.0	10.0					
Timer Results			EBI		EBT	WBI	П	WBT	NBI	$\overline{}$	NBT	SBI		SBT
Assigned Phase					4			8	5		2	1		6
Case Number					10.0			12.0	2.0		4.0	2.0		4.0
Phase Duration, s					17.6			9.4	11.0) :	26.0	5.4		20.5
Change Period, (Y+R c),	3 / //				5.5			5.5	5.0		5.5	5.0		5.5
Max Allow Headway (MA	x Allow Headway (<i>MAH</i>), s				3.2			3.2	3.1		3.1	3.1		3.1
Queue Clearance Time (g ₅), S				11.1			2.5	5.7		8.5	2.1		5.7
Green Extension Time (g	7 e), S				1.0			0.1	0.2		1.5	0.0		1.5
Phase Call Probability					1.00			0.39	0.85	5	1.00	0.06		1.00
Max Out Probability					0.00			0.00	0.00)	0.00	0.00)	0.00
Movement Group Resul	ts			EB			WE	3		NB			SB	
Approach Movement			L	T	R	L	Т	R	L	Т	R	L	Т	R
Assigned Movement			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v),	veh/h		195	282		16	_	14	116	270	270	4	136	127
Adjusted Saturation Flow		ln .	1767	1721		1788		1576	1767	1856	1851	1767	1856	1606
Queue Service Time (g s			5.7	9.1		0.5	_	0.5	3.7	6.5	6.5	0.1	3.4	3.7
Cycle Queue Clearance T			5.7	9.1		0.5		0.5	3.7	6.5	6.5	0.1	3.4	3.7
Green Ratio (g/C)	(g 0), G		0.21	0.21		0.07		0.07	0.10	0.35	0.35	0.01	0.26	0.26
Capacity (c), veh/h			367	357		119		105	180	651	649	14	476	412
Volume-to-Capacity Ratio)(X)		0.530	0.788		0.132		0.135	0.643	0.415	0.416	0.293	0.286	0.308
Back of Queue (Q), ft/ln	· ,	')	100	158		9		8	69	110	107	3	62	56
Back of Queue (Q), 1811			3.9	6.2		0.4		0.3	2.7	4.3	4.3	0.1	2.4	2.3
Queue Storage Ratio (Ro			0.20	0.32		0.20		0.18	0.14	0.22	0.22	0.01	0.12	0.12
Uniform Delay (d 1), s/ve			20.7	22.0		25.7		25.7	25.3	14.4	14.4	28.9	17.5	17.6
			0.4	1.5		0.2		0.2	1.4	0.2	0.2	4.3	0.1	0.2
	remental Delay (d 2), s/veh			0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	tial Queue Delay (d 3), s/veh			23.5		25.9		25.9	26.7	14.6	14.6	33.2	17.6	17.7
Level of Service (LOS)				C		C		C	C	В	В	C	В	В
Approach Delay, s/veh / L	OS		C 22.5		С	25.9		C	16.7		В	17.9		В
Intersection Delay, s/veh						9.1			10.7			B		
	Itimodal Results						W	2		NB			CD	
Multimodal Results			_	EB		_	_		_	_		_	SB	
Multimodal Results Pedestrian LOS Score / L Bicycle LOS Score / LOS			2.29		B A	2.29 0.51	\Box	B A	1.90		B A	2.10		B A

Table 136. Wacker Dr and JFK Rd Saturday 11-12PM HCS 5-yr Projected Conditions Optimized

		HCS	Sigr	nalize	d Inte	rsect	ion R	esı	ılts Sı	ım	mary	,				
General Inforn	nation								_			ormatic		- i	411	ja lu
Agency						,			Durati	on,	h	1.000		-		
Analyst				Analys	is Date	2/20/2	2024		Area T	ype	9	Other		-ts		
Jurisdiction				Time F		_			PHF			1.00		± +		÷
Urban Street				Analys	is Year	2024			Analys	is F	eriod	1> 12	:00	7		
Intersection		11am-12pm Wacke	r/JFK	File N	ame	Inters	ection (\	Nacl	ker-JFK)	_O\	verall_[Delay_5	yr.xus		<u> ጎተት</u>	
Project Descrip	tion		_	_	_	_	_		_		_	_	_		4144	P M
Demand Infor	mation				EB			٧	VΒ			NB			SB	
Approach Move	ement			L	Т	R	L		TF	₹	L	Т	R	L	Т	R
Demand (v), v	/eh/h			409	1	75	13	\perp	4 1	5	122	563	4	14	523	373
Signal Informa	ation				T U.	T		Т				7				
Cycle, s	58.8	Reference Phase	2	1	E	F.A.		"E	3 2			\ \ \	_	1		↔
Offset, s	0	Reference Point	End		()	51		4	9	4	100		1	2	3	Y
Uncoordinated	Yes	Simult. Gap E/W	On	Green Yellow	-	0.6 3.5	15.0 4.0	_	2.1 4. .0 3.		0.0				7	→
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	1.5	1.5		.5 2.		0.0		5	6	7	
					_					Ų						
Timer Results				EBI	-	EBT	WBI	L	WBT	4	NBI	-	NBT	SBI	-	SBT
Assigned Phas	e					4		_	8	4	5		2	1	\rightarrow	6
Case Number					_	10.0			12.0	4	2.0		4.0	2.0	-	4.0
Phase Duration				_	\perp	17.6		_	9.6	4	11.1		26.1	5.5	-	20.5
	ange Period, (Y+R c), s x Allow Headway (MAH), s			_	-	5.5	_		5.5	4	5.0	_	5.5	5.0	_	5.5
				_	+	3.3			3.2	4	3.1	_	3.1	3.1	_	3.1
Queue Clearan		10 //		-	-	11.2	-		2.5	-	5.9 0.2	-	8.9	2.1	-	6.0
Green Extension		(g e), S		_	_	0.9	-	\dashv	0.1	-		_	1.6	0.0	_	1.6
Phase Call Pro Max Out Proba					-	0.00		\dashv	0.41	+	0.86	-	0.00	0.07	-	0.00
Wax Out Floba	Dility					0.00			0.00	ė	0.00		0.00	0.00		0.00
Movement Gro	oup Res	sults			EB			W	/B	1		NB			SB	
Approach Move	ement			L	T	R	L	╚	R	4	L	T	R	L	Т	R
Assigned Move	ement			7	4	14	3	8	18	4	5	2	12	1	6	16
Adjusted Flow	Rate (v), veh/h		205	281		17		15	-	122	284	283	4	144	133
		ow Rate (s), veh/h/l	n	1767	1712		1787		156	-	1767	1856	1851	1767	1856	1597
Queue Service		J ,.		6.1	9.2		0.5		0.5	-	3.9	6.9	6.9	0.1	3.7	4.0
		e Time (<i>g ₀</i>), s		6.1	9.2		0.5		0.5	-	3.9	6.9	6.9	0.1	3.7	4.0
Green Ratio (g				0.21	0.21		0.07		0.0	-	0.10	0.35	0.35	0.01	0.26	0.26
Capacity (c), v		-P- 737		366	354		125		110	-	183	649	647	15	473	407
Volume-to-Cap			`	0.559	0.792		0.134		0.13	ŏ	0.667	0.438	0.438	0.290	0.304	0.328
		t/In (95 th percentile		108	160		10		9	+	74	118	115	3	66	60
		eh/In (95 th percent RQ) (95 th percent	· ·	0.22	0.32		0.4		0.3	-	0.15	4.6 0.24	4.6 0.24	0.1	2.6 0.13	0.12
Uniform Delay				21.0	22.2		25.7		25.	-	25.5	14.7	14.7	29.1	17.7	17.9
	· /·			0.5	1.5		0.2		0.2	-	1.6	0.2	0.2	3.7	0.1	0.2
	cremental Delay (d 2), s/veh itial Queue Delay (d 3), s/veh			0.0	0.0		0.0		0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (21.5	23.7		25.9		25.	-	27.0	14.9	14.9	32.8	17.9	18.0
Level of Service				С	С		С		С	-	С	В	В	С	В	В
Approach Dela	y, s/veh	/LOS		22.8	3	С	25.9		С	Ī	17.0)	В	18.2	2	В
Intersection De	lay, s/ve	eh / LOS				19	9.3			J				В		
Multimodal Re	sults				EB			W	/B	7		NB			SB	
		/LOS		2.29		В	2.29	_	В	+	1.90	_	В	2.10		В
Pedesman i or	strian LOS Score / LOS					_		٠ ا				1	_			_

HCS™ Streets Version 2024

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Table 137. Wacker Dr and JFK Rd Saturday 11-12PM HCS 10-yr Projected Conditions Optimized

	HCS	Sigr	nalize	d Inte	rsect	ion R	esu	its Sun	nmary					
Conoral Information								Interne	tion Inf	a vma a ti s			الطلطالة	E U
General Information	I							Intersec		_			414	
Agency					To to o to			Duration		1.000		-		
Analyst				is Date	2/20/2	2024		Area Typ	oe	Other				
Jurisdiction			Time F		-			PHF		1.00		*		*
Urban Street				is Year	+			Analysis		1> 12		7		
Intersection	11am-12pm Wacke	r/JFK	File Na	ame	Inters	ection (V	Nack	er-JFK)_(Overall_	Delay_1	10yr.xus		ጎተት	
Project Description		_	_	_	_	_			_	_	_		4144	P IT
Demand Information				EB			V	VB		NB			SB	
Approach Movement			L	T	T R	1		T R	1	T	R	1	T	T R
Demand (v), veh/h			430	18	78	13	-	4 16	128	592	4	14	550	39
Demand (v), ven/ii			430	10	70	10		4 10	120	332	4	14	330	33
Signal Information				Ţ	\top		Τ.	. 2	\top					
Cycle, s 57.2	Reference Phase	2		7	l sti		₽Ę				7	P		4
Offset, s 0	Reference Point	End	Green	0.4	0.1	15.0	1	2.8 2.5	0.0		1	2	3	
Uncoordinated Yes	Simult. Gap E/W	On	Yellow		3.5	4.0	3.	-	0.0				7	→
Force Mode Fixed	Simult. Gap N/S	On	Red	1.5	1.5	1.5	2.	-	0.0		5	6	7	
Timer Results			EBI	-	EBT	WBI	L	WBT	NBI	_	NBT	SBI	_	SBT
Assigned Phase					4			8	5		2	1		6
Case Number					10.0			12.0	2.0		4.0	2.0		4.0
Phase Duration, s				- -	18.3			8.0	10.5	5	25.7	5.4		20.5
Change Period, (Y+R	ange Period, (Y+R c), s				5.5		\neg	5.5	5.0		5.5	5.0		5.5
Max Allow Headway (x Allow Headway (<i>MAH</i>), s				3.2		\neg	3.3	3.1		3.1	3.1	\neg	3.1
Queue Clearance Time	eue Clearance Time ($g \circ$), s				11.8			2.6	6.0		9.1	2.1		6.3
Green Extension Time	(ge), S			\neg	0.9		\neg	0.0	0.2		1.7	0.0	\neg	1.7
Phase Call Probability					1.00		\dashv	0.41	0.87	7	1.00	0.07	7	1.00
Max Out Probability					0.04		\neg	0.00	0.00	,	0.00	0.00		0.00
Movement Group Res	sults			EB		Ь.	W	_		NB			SB	
Approach Movement			L	T	R	L		R	L	T	R	L	T	R
Assigned Movement			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h		215	311		17		16	128	298	298	5	160	14
Adjusted Saturation Flo	ow Rate (s), veh/h/l	n	1767	1717		1787		1541	1767	1856	1851	1767	1856	159
Queue Service Time (6.2	9.8		0.5		0.6	4.0	7.1	7.1	0.1	4.0	4.3
Cycle Queue Clearanc	e Time (g o), s		6.2	9.8		0.5		0.6	4.0	7.1	7.1	0.1	4.0	4.3
Green Ratio (g/C)			0.22	0.22		0.04		0.04	0.10	0.35	0.35	0.01	0.26	0.2
Capacity (c), veh/h			395	384		77		67	171	653	652	11	485	41
Volume-to-Capacity Ra	atio (X)		0.544	0.810		0.220		0.240	0.750	0.457	0.457	0.414	0.329	0.35
Back of Queue (Q), f)	107	170		10		9	77	120	116	4	71	64
Back of Queue (Q), v		,	4.2	6.6		0.4		0.4	3.0	4.7	4.7	0.2	2.8	2.6
Queue Storage Ratio (0.21	0.34		0.22		0.21	0.15	0.24	0.24	0.01	0.14	0.1
Uniform Delay (d 1), s		-,	19.7	21.1		26.5		26.5	25.2	14.3	14.3	28.4	17.1	17.
Incremental Delay (d 7), s			0.4	1.6		0.5		0.7	2.5	0.2	0.2	8.4	0.1	0.2
Initial Queue Delay (d			0.0	0.0		0.0		0.0	0.0	0.2	0.2	0.0	0.0	0.0
Control Delay (d), s/v			20.1	22.7		27.0		27.2	27.8	14.5	14.5	36.8	17.2	17.
Level of Service (LOS)			C	C C		C C		C	C C	B B	B	D D	B	17.
			21.7		С	27.1			16.9		В	17.6		B
Approach Delay, s/veh Intersection Delay, s/ve			21.7			3.8		C	16.5			B 17.6	,	0
microection Delay, S/V	JII / LOG				10	J. U								
				EB			W	В		NB			SB	
Multimodal Results														$\overline{}$
Multimodal Results Pedestrian LOS Score	/ LOS		2.29)	В	2.29)	В	1.90)	В	2.10)	В

Table 138. Wacker Dr and JFK Rd Saturday 11-12PM HCS 20-yr Projected Conditions Optimized

	HCS S	Sign	alize	d Inte	ersect	ion R	esu	lts Sun	nmary	,				
General Information								Intersec	tion Inf	ormatic	n	2	411	Ja II.
Agency								Duration	, h	1.000			4+%	
Analyst			Analys	sis Date	2/20/2	2024		Area Typ	e	Other		±.		
Jurisdiction			Time F	Period				PHF		1.00		*		÷
Urban Street			Analys	sis Yea	r 2024			Analysis	Period	1> 12	:00	70		
Intersection	11am-12pm Wacker/J	FK	File Na	ame	Inters	ection (\	Nack	er-JFK) C	verall	Delay 2	0yr.xus		5.1%	
Project Description						,						- 1	4144	14
Demand Information				EB			10	/B	1	NB			SB	
		\rightarrow	L	T	T R		_	r R	L	T	T D		T T	Т
Approach Movement		-	_	-	+	-	-		+-	_	R	+-	-	R
Demand (v), veh/h			475	20	87	15		5 18	142	654	5	16	608	433
Signal Information				ΤŢ			Т	<u>S</u>	Т	ш				
Cycle, s 58.4	Reference Phase	2		E	54		ãЫ	7			-	V		-4
Offset, s 0	Reference Point E	End		1	51						1	2	3	Y
Uncoordinated Yes		On	Green Yellow		0.0	4.0	3.	3.0 3.0	0.0				7	\rightarrow
Force Mode Fixed	-	On	Red	1.5	0.0	1.5	2.		0.0		5 -1	6	7	•
Timer Results			EBI	-	EBT	WBI	L	WBT	NBI	L	NBT	SBI	-	SBT
Assigned Phase					4			8	5		2	1		6
Case Number					10.0			12.0	1.1		4.0	1.1		4.0
Phase Duration, s		\neg		$\neg \vdash$	19.8		\neg	8.3	9.8		24.9	5.4	\neg	20.5
Change Period, (Y+R	c), S	\neg			5.5		\neg	5.5	5.0		5.5	5.0		5.5
Max Allow Headway (x Allow Headway (MAH), s			\neg	3.2		\neg	3.3	3.1	\neg	3.1	3.1	\neg	3.1
	eue Clearance Time ($g \circ$), s				13.1			2.7	5.3		10.5	2.1		6.7
	eue Clearance Time ($g \circ$), s een Extension Time ($g \circ$), s			\neg	1.1		\neg	0.1	0.0		1.8	0.0	\neg	1.9
Phase Call Probability	,,				1.00		\neg	0.46	0.90		1.00	0.08	3	1.00
Max Out Probability		\neg			0.00		\exists	0.00	1.00		0.00	0.00		0.00
		-												
Approach Movement	suits	-	L	EB T	l R	L	W	R	L	NB T	R	L	SB T	R
Approach Movement		-		4		_	_		_	_		$\overline{}$	<u> </u>	-
Assigned Movement	h //h	-	7	<u> </u>	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v	**	_	238	345	-	20		18	142	330	329	5	168	153
Adjusted Saturation Flo		-	1767	1716	-	1788		1526	1767	1856	1850	1767	1856	1587
Queue Service Time (_	6.9	11.1		0.6		0.7	3.3	8.5	8.5	0.1	4.3	4.7
Cycle Queue Clearanc	e nine (ge), s		6.9	11.1		0.6		0.7	3.3	8.5	8.5	0.1	4.3	4.7
Green Ratio (g/C)		_	0.24	0.24		0.05		0.05	0.36	0.33	0.33	0.26	0.26	0.26
Capacity (c), veh/h	-4:- / 3/3	_	434	422		86		73	454	616	615	252	476	407
Volume-to-Capacity Ra		_	0.547	0.817		0.232		0.245	0.313	0.535	0.535	0.020	0.352	0.37
Back of Queue (Q), f			118	190		12		11	52	146	142	2	77	70
	eh/ln (95 th percentile)	\rightarrow	4.6	7.4		0.5		0.4	2.0	5.7	5.7	0.1	3.0	2.8
	RQ) (95 th percentile)	0.24	0.38		0.27		0.24	0.10	0.29	0.29	0.00	0.15	0.14
Uniform Delay (d 1), s		_	19.2	20.8		26.8		26.8	13.3	15.9	15.9	16.3	17.8	17.9
Incremental Delay (d a	,-		0.4	1.5		0.5		0.6	0.1	0.3	0.3	0.0	0.2	0.2
Initial Queue Delay (d	з), s/veh		0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/v	eh		19.6	22.4		27.3		27.5	13.4	16.2	16.2	16.3	18.0	18.1
Level of Service (LOS)			В	С		С		С	В	В	В	В	В	В
Approach Delay, s/veh	/LOS		21.3	3	С	27.4		С	15.7	7	В	18.0)	В
Intersection Delay, s/ve	eh / LOS				18	3.2						В		
							14.			NID			65	
		-	0.00	EB	D	0.00	WI		1.00	NB	<u> </u>	0.40	SB	В
Multimodal Results	estrian LOS Score / LOS													
			2.29	-	B A	2.29 0.52	\rightarrow	B A	1.90	-	B A	1.36	-	A

Table 139. Wacker Dr and JFK Rd Saturday 4-5PM HCS Existing Conditions

		1100	Sigr	Iuiizc	u iiitt	13000	IOII IX	CSui	to C un	iiiiai y					
General Inform	ation							ı	Intersec	tion Inf	ormatic	'n		4741	ياط
Agency	iauon								Duration		1.000			417	
Analyst				Analys	is Date	2/20/2	024		Area Typ	,	Other		4		
Jurisdiction				Time F		212012	024		PHF		1.00		→ ->		٠
Urban Street					sis Year	2024			Analysis	Deriod	1> 12	.00	- 3		•
Intersection		4-5pm Wacker/JFK				_	oction (Macke					- 5		_
Project Descrip	tion	4-Spill Wacker/SFK		File Na	airie	linterse	ction (v	vacke	er-JFK)-C	pumza	IOH.XUS			11 P	P 1"
r roject Descrip	uon														
Demand Inforr	nation				EB		\Box	W	В	\top	NB			SB	
Approach Move	ement			L	Т	R	L	T	R	L	Т	R	L	Т	R
Demand (v), v	eh/h			329	26	57	10	9	12	104	364	5	20	332	237
Signal Informa					7		125	12	\succeq		Ιl		-4-		_
Cycle, s	55.6	Reference Phase	2		5	517	" I S≨∩	r Ri	2			1	Y	3	❤
Offset, s	0	Reference Point	End	Green	1.1	1.1	14.3	10.	4 2.3	0.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	-	3.5	4.0	3.0		0.0		\ 4	<u> </u>	∠	Z
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	1.5	1.5	2.5	2.5	0.0		5	6	7	
Times Deculée				EBI		CDT	WD		WDT	ND		NDT	CDI		CDT
Timer Results	0			EBI	-	EBT 4	WB	L	WBT	NBI 5	-	NBT 2	SBI 1	-	SBT 6
Assigned Phase	e			-		_		+	8	_		_	_	_	
Case Number				_	_	10.0		+	10.0	1.1	+	4.0	1.1	_	4.0
Phase Duration	· · · · · · · · · · · · · · · · · · ·			_	_	15.9		-	7.8	12.2	\rightarrow	25.9	6.1	$\overline{}$	19.8
	ange Period, (Y+R ₅), s ax Allow Headway (MAH) s			-	-	5.5		+	5.5	5.0	-	5.5	5.0	_	5.5
	ax Allow Headway (<i>MAH</i>), s leue Clearance Time (<i>g</i> s), s			\vdash	_	3.2		+	3.2	3.1	_	3.1	3.1	-	3.1
				_	-	9.6		+	2.7	7.1	-	12.6	2.4	-	8.4
Green Extensio		(g e), S		_	_	0.8		+	0.0	0.3	-	1.9	0.0	-	1.8
Phase Call Pro				—	_	1.00		+	0.38	0.98	-	1.00	0.22	_	1.00
Max Out Proba	Dility				-	0.00		-	0.00	0.00		0.32	0.00	_	0.02
Movement Gro	up Res	ults			EB			WB			NB			SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Assigned Move	ment			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow F	Rate (v), veh/h		165	248		10	21		240	428	426	16	238	214
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1767	1728		1810	1682	2	1767	1856	1847	1767	1856	1602
Queue Service	Time (g s), S		4.6	7.6		0.3	0.7		5.1	10.6	10.6	0.4	6.1	6.4
Cycle Queue C	learanc	e Time (<i>g</i> _c), s		4.6	7.6		0.3	0.7		5.1	10.6	10.6	0.4	6.1	6.4
Green Ratio (g	/C)			0.19	0.19		0.04	0.04		0.42	0.37	0.37	0.28	0.26	0.26
Capacity (c), v	/eh/h			330	323		75	69		489	679	676	253	475	410
Volume-to-Cap	acity Ra	itio (X)		0.498	0.767		0.134	0.30	3	0.491	0.629	0.629	0.063	0.501	0.52
Back of Queue	(Q), fl	t/In (95 th percentile)	81	132		6	12		75	150	146	6	107	94
Back of Queue	(Q), ve	eh/In (95 th percenti	le)	3.2	5.1		0.2	0.5		2.9	5.9	5.8	0.2	4.2	3.8
		RQ) (95 th percent		0.16	0.26		0.00	0.27		0.15	0.30	0.30	0.01	0.00	0.00
Uniform Delay ((d 1), S	/veh		20.3	21.5		25.7	25.9		11.6	14.5	14.5	15.1	17.7	17.8
Incremental De	cremental Delay (d 2), s/veh			0.4	1.5		0.3	0.9		0.1	0.6	0.6	0.0	0.2	0.3
Initial Queue De	elay (d	з), s/veh		0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/ve	eh		20.7	23.0		26.0	26.8		11.8	15.1	15.1	15.2	17.9	18.
Level of Service	e (LOS)			С	С		С	С		В	В	В	В	В	В
Approach Delay	y, s/veh	/LOS		22.1	1	С	26.6	6	С	14.4	l	В	17.9)	В
Intersection De	lay, s/ve	eh / LOS				17	.0						В		
					EB										
	ultimodal Results							MAID			NB			0.0	
			Itimodal Results destrian LOS Score / LOS					WB	В	1.89		В	_	SB	В

HCS™ Streets Version 2024

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Table 140. Wacker Dr and JFK Rd Saturday 4-5PM HCS Existing Conditions Optimized

		HC:	o oigr	nalize	u inte	rsect	ION K	esu	15 5	um	шагу					
General Inform	ation								Inter	coct	ion Infe	ormatic	n.	l k	I de Jude 1	p U
	auon								Durat			1.000			417	
Agency				l Amelia	ia Data	Toyonyo	004									
Analyst				-	is Date	2/20/2	024	_	Area	тур	e	Other				. 4
Jurisdiction				Time F					PHF			1.00		*		۰
Urban Street				_	is Year	+					Period	1> 12		5		<u>_</u>
Intersection		4-5pm Wacker/JFK		File Na	ame	Interse	ection (\	Wacke	er-JFK	()_0	verall_[Delay_E	Existin		<u> ጎተት</u>	
Project Descript	tion									_					1147	P.C
Demand Inforn	nation				EB			W	В			NB			SB	
Approach Move	ment			L	Т	□ R	1	T	- T	R		Т	R	1	Т	T R
Demand (v), v				329	26	57	10	9	\rightarrow	12	104	364	-	20	332	23
Signal Informa					6		2	La	\equiv			Į		4.		
Cycle, s	62.3	Reference Phase	2		5	Sti	7 1	rR	E				1	2	3	↔
Offset, s	0	Reference Point	End	Green	1.7	3.6	15.0	11	.3 4	1.2	0.0					<u></u>
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	-	3.5	4.0	3.0	-	3.0	0.0		\ 4	_	⋰	7
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	1.5	1.5	2.5	5 2	2.5	0.0		5	6	7	
Timer Results				EBI		EBT	WB		WBT		NBI		NBT	SBI		SBT
Assigned Phase	2			EBI	-	4	VVB	_	8		5		2	1	-	6
Case Number						10.0		_	10.0		2.0		4.0	2.0		4.0
Phase Duration	•			_	-	16.8	_	\rightarrow	9.7	_	15.3		29.1	6.7	-	20.5
	,	-) c		_	\rightarrow	5.5	_	\rightarrow	5.5	-	5.0	\rightarrow	5.5	5.0	-	5.5
	ange Period, (Y+R c), s x Allow Headway (MAH), s				_	3.2	_	\rightarrow	3.2	-	3.1	_	3.1	3.1	_	3.1
	IX Allow Headway (MAH), s						_	\rightarrow		-					\rightarrow	
	eue Clearance Time ($g \circ$), s een Extension Time ($g \circ$), s				-	10.5 0.7	-	\rightarrow	0.0	-	10.2 0.2		13.4 2.6	2.5 0.0	_	9.3
Phase Call Prot		(g e), s		_	$\overline{}$	1.00	_	-	0.42		0.98		1.00	0.0	-	1.00
Max Out Probat				_	-	0.00	_	\rightarrow	0.42	_	0.30	-	0.12	0.00	-	0.00
Wax Out Flobal	Jility					0.00			0.00		0.22		0.12	0.00		0.00
Movement Gro	up Res	ults			EB			WE	3			NB			SB	
Approach Move	ment			L	Т	R	L	T	F	₹	L	Т	R	L	Т	R
Assigned Move	ment			7	4	14	3	8	1	8	5	2	12	1	6	16
Adjusted Flow F	Rate (v), veh/h		165	248		10	21			241	843	0	16	238	214
Adjusted Satura	tion Flo	ow Rate (s), veh/h/l	n	1767	1728		1810	168	2		1767	1856	0	1767	1856	160
Queue Service	Time (g s), S		5.2	8.5		0.3	0.7			8.2	11.4	0.0	0.5	7.0	7.3
Cycle Queue Cl	earanc	e Time (<i>g</i> ₀), s		5.2	8.5		0.3	0.7			8.2	11.4	0.0	0.5	7.0	7.3
Green Ratio (g.	/C)			0.18	0.18		0.07	0.07	7		0.17	0.38		0.03	0.24	0.2
Capacity (c), v	eh/h			321	314		122	113			294	1408		48	446	385
Volume-to-Capa	acity Ra	atio (X)		0.512	0.788		0.082	0.18	6		0.818	0.599	0.000	0.329	0.533	0.55
Back of Queue	(Q), f	t/In (95 th percentile	:)	94	154		6	13			132	161	0	11	128	113
Back of Queue	(Q), ve	eh/ln (95 th percenti	ile)	3.7	6.0		0.2	0.5			5.2	6.3	0.0	0.4	5.0	4.5
Queue Storage	Ratio (RQ) (95 th percent	tile)	0.19	0.31		0.00	0.29	9		0.27	0.32	0.00	0.02	0.00	0.0
Uniform Delay (d 1), s	/veh		23.1	24.4		27.3	27.5	5		25.1	15.6		29.8	20.7	20.
				0.5	1.7		0.1	0.3	\rightarrow		2.1	0.2	0.0	1.1	0.3	0.3
	cremental Delay (d 2), s/veh tial Queue Delay (d 3), s/veh			0.0	0.0		0.0	0.0	$\overline{}$		0.0	0.0	0.0	0.0	0.0	0.0
	ontrol Delay (d), s/veh				26.1		27.4	27.8	\rightarrow		27.2	15.7		30.9	20.9	21.
	vel of Service (LOS)			23.5 C	С		С	С			С	В		С	С	С
Approach Delay				25.1		С	27.7		C		18.3		В	21.4		С
Intersection Del).6				10.0			C		
Multimodal Re					EB			WE				NB			SB	
Dedectrian LOS	Score	/ LOS		2.29	-	В	2.30	\rightarrow	В		1.90	-	В	1.91	-	В
T Cucsinan LOS	estrian LOS Score / LOS cle LOS Score / LOS					Α	0.54		Α			, I	Α	0.97		Α

Table 141. Wacker Dr and JFK Rd Saturday 4-5PM HCS 5-yr Projected Conditions Optimized

			nalize							,					
General Information								Inters	ection	nform	atio	n	l J	4744	Ja lu
Agency								Durati		_	000			417	
Analyst			Analys	is Date	2/20/2	0024		Area 7	,	-	her				
Jurisdiction			Time F		ZIZOIZ	.024		PHF	ypc	1.0			→		*
Urban Street			-	is Year	2024				sis Perio	-	12:	.00	-{		
Intersection	4-5pm Wacker/JFK		File Na		-	ection (Mack			_					_
Project Description	4-5pm wacker/JFK		FIIE IN	airie	linterse	ection (vvack	EI-JFK	_Overa	II_Dela	y_5	yı.xus	- 4	4144	r r
rojest Bessiiption															
Demand Information				EB			W	В		1	ΝB			SB	
Approach Movement			L	Т	R	L	1		₹	_	Т	R	L	Т	R
Demand (v), veh/h			346	27	60	11	9) 1	3 1	09 3	83	1	21	350	25
Signal Information						I II	7	2			Ŧ				
Cycle, s 63.6	Reference Phase	2		2			_ 🖃	Ħ			ļ	_	t		Z
Offset, s 0	Reference Point	End		1	117							1	2	3	Z
Uncoordinated Yes	Simult. Gap E/W	On	Green		4.0	15.0	11	-		.0	ĸ			_	4
Force Mode Fixed	· · · · · ·	On	Yellow Red	1.5	3.5 1.5	1.5	3.0	-	-	.0	1) [²	_	- / ,	~
orce would Fixed	Simult. Gap N/S	Oll	Reu	1.0	1.0	1.0	Z.:	, ,2	J IU	.v			6		
Timer Results			EBI		EBT	WB	L	WBT	I	IBL		NBT	SBI		SBT
Assigned Phase					4			8		5		2	1		6
Case Number					10.0		\neg	10.0		2.0		4.0	2.0		4.0
Phase Duration, s					17.4		\neg	9.9	1	5.8	2	29.5	6.8		20.5
Change Period, (Y+R	c), S				5.5		\neg	5.5		5.0		5.5	5.0		5.5
	x Allow Headway (<i>MAH</i>), s				3.2		\neg	3.2		3.1		3.1	3.1	\neg	3.1
	eue Clearance Time ($g \circ$), s				11.2		\rightarrow	2.8	_	0.7		14.3	2.6	$\overline{}$	10.0
Green Extension Time	,,,				0.7		\rightarrow	0.0	_).2		2.7	0.0	_	2.8
Phase Call Probability	(3).				1.00		\rightarrow	0.44	0	.99		1.00	0.25	5	1.00
Max Out Probability					0.03		\rightarrow	0.00	0	34		0.00	0.00		0.00
Movement Group Re	sults			EB		_	WE	_	4	N	_			SB	
Approach Movement			느	T	R	L	T	R			\rightarrow	R	L	T	R
Assigned Movement			7	4	14	3	8	18	_	2	\rightarrow	12	1	6	16
Adjusted Flow Rate (v	/), veh/h		173	260		11	22		24	9 43	8	438	17	251	22
Adjusted Saturation Fl	ow Rate (s), veh/h/l	n	1767	1725		1810	166	7	176	7 18	56	1854	1767	1856	158
Queue Service Time (• ,-		5.6	9.2		0.4	0.8	\rightarrow	8.7	\rightarrow	\rightarrow	12.3	0.6	7.6	8.
Cycle Queue Clearand	ce Time ($g \circ$), s		5.6	9.2		0.4	0.8	\rightarrow	8.7	_	_	12.3	0.6	7.6	8.
Green Ratio (g/C)			0.19	0.19		0.07	0.07	\rightarrow	0.1	\rightarrow	\rightarrow	0.38	0.03	0.24	0.2
Capacity (c), veh/h			330	322		126	116	\rightarrow	30	_	\rightarrow	701	50	437	37
Volume-to-Capacity Ra			0.524	0.806		0.087	0.18	9	0.82	\rightarrow	25	0.625	0.333	0.576	0.5
Back of Queue (Q), 1	ft/In (95 th percentile)	102	167		7	14		15	_	_	180	12	140	12
Back of Queue (Q), v	eh/In (95 th percent	ile)	4.0	6.5		0.3	0.6		6.0	7.	2	7.2	0.4	5.4	4.
Queue Storage Ratio ((RQ) (95 th percent	tile)	0.20	0.33		0.00	0.31	1	0.3	1 0.3	37	0.37	0.02	0.00	0.0
Uniform Delay (d 1), s			23.4	24.8		27.8	28.0	\rightarrow	25.	\rightarrow	\rightarrow	16.2	30.4	21.6	21
Incremental Delay (d :	2), s/veh		0.5	1.9		0.1	0.3		4.0	0.	2	0.2	1.0	0.3	0.
Initial Queue Delay (d	tial Queue Delay (d 3), s/veh			0.0		0.0	0.0		0.0	0.	0	0.0	0.0	0.0	0.
Control Delay (d), s/v	ontrol Delay (d), s/veh			26.7		27.9	28.2	2	29.	5 16	.4	16.4	31.4	21.9	22
Level of Service (LOS)	7			С		С	С		С	E		В	С	С	С
Approach Delay, s/veh	I/LOS		25.5	5	С	28.1	1	С	1	9.3		В	22.3	3	С
Intersection Delay, s/ve	eh / LOS				21	1.4							С		
Multimodal Results	/1.00		0.00	EB		0.00	WE		-	N n	В		4.0	SB	
Pedestrian LOS Score	LUS		2.29	<u>' </u>	В	2.30)	В	1	.90		В	1.91		В

Table 142. Wacker Dr and JFK Rd Saturday 4-5PM HCS 10-yr Projected Conditions Optimized

	-	1100	, Oigi	Iulizo	u iiite	13000	ion ix	CSui	ts Sun	illilai y					-
General Inform	ation								Intersec	tion Inf	ormatic	on.	l J	14741	ja lu
Agency									Duration		1.000			411	
Analyst				Δnalvs	is Date	2/20/2	024	\rightarrow	Area Typ		Other				
Jurisdiction				Time F		212012	.024		PHF		1.00				4
Urban Street				_	is Year	2024		-	Analysis	Deriod	1> 12	-00			•
		4 Epm Wasker/ IEI/		-		+	action (Mooko							_
Intersection Project Descript	tion	4-5pm Wacker/JFK		File Na	ame	Interse	ection (wacke	er-JFK)_(overali_	Delay_	ioyi.xus		117	P (*
r roject bescript	lion														
Demand Inforn	nation				EB			W	В		NB			SB	
Approach Move	ment			L	Т	R	L	T	R	L	T	R	L	T	R
Demand (v), v	eh/h			363	29	63	11	10	13	115	402	9	22	368	26
Cianal Informa	tion					_	1 11:	7	r		-				
Cycle, s	56.6	Reference Phase	2	1	5			_ 🔄	Ħ		Į	_	址		Z
Offset, s	0	Reference Point	End		1	STI?						1	2	3	Z
Uncoordinated	Yes	Simult. Gap E/W	On	Green		4.7	15.1	11.		0.0					4
Force Mode		· ·		Yellow	-	0.0	4.0	3.0		0.0		\		-	~
roice Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.5	2.5	10.0		3	6	- /	
Timer Results				EBI		EBT	WB	L	WBT	NBI		NBT	SBI		SBT
Assigned Phase	9					4			8	5		2	1		6
Case Number					-	10.0		\neg	10.0	1.1		4.0	1.1		4.0
Phase Duration	. s					17.0		\neg	8.0	11.0		25.2	6.3		20.6
Change Period.	ange Period, (Y+R o), s					5.5			5.5	5.0		5.5	5.0		5.5
	x Allow Headway (<i>MAH</i>), s				$\overline{}$	3.2	-	\neg	3.2	3.1	_	3.1	3.1	_	3.1
	x Allow Headway (<i>MAH</i>), s eue Clearance Time (<i>g</i> _s), s				\rightarrow	10.5		\rightarrow	2.8	7.9	\rightarrow	14.5	2.4	$\overline{}$	10.1
Green Extensio					-	0.9		\neg	0.1	0.0	-	3.1	0.0	_	3.1
Phase Call Prot		(3-71-			-	1.00		\rightarrow	0.42	0.98	3	1.00	0.26	3	1.00
Max Out Probat	bility					0.00		\neg	0.00	1.00		0.00	0.00		0.00
Movement Gro		sults			EB			WB	_		NB			SB	
Approach Move				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Move				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow F				182	274		11	23		261	468	464	19	294	25
-		ow Rate (s), veh/h/l	n	1767	1724		1810	1664	1	1767	1856	1840	1767	1856	158
Queue Service		3 7.		5.2	8.5		0.3	0.8	+	5.9	12.5	12.5	0.4	7.9	8.1
Cycle Queue Cl		e Time (gε), s		5.2	8.5		0.3	0.8	+	5.9	12.5	12.5	0.4	7.9	8.1
Green Ratio (g				0.20	0.20		0.04	0.04		0.40	0.35	0.35	0.29	0.27	0.2
Capacity (c), v		4:- / 3/		362	353		81	75		421	646	641	222	494	42
Volume-to-Capa				0.502	0.775		0.136	0.308	5	0.619	0.724	0.724	0.087	0.596	0.6
		t/In (95 th percentile	,	90	148		6	14		94	181	175	7	136	119
		eh/ln (95 th percenti		3.5	5.8		0.2	0.5	-	3.7	7.1	7.0	0.3	5.3	4.8
		RQ) (95 th percent	iie)	0.18	0.30		0.00	0.30	_	0.19	0.36	0.36	0.01	0.00	0.0
Uniform Delay (20.0	21.3		26.1	26.3	-	13.1	16.1	16.1	15.4	18.2	18.
Incremental Del				0.4	1.4		0.3	0.9	_	1.1	0.3	0.3	0.0	0.3	0.4
	tial Queue Delay (d 3), s/veh			0.0	0.0		0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (20.4 C	22.7		26.3	27.1		14.2	16.4	16.4	15.4	18.5	18.
	vel of Service (LOS)				C		С	C		В	В	_ B	В	В	_ B
Approach Delay				21.8	3	С	26.9	9	С	15.9)	В	18.4	1	В
Intersection Del	ay, s/ve	eh / LOS				17	7.9						В		
Multimodal Re	sults				EB			WB			NB			SB	
	Itimodal Results) [В	2.29	_	В	1.90		В	1.91	_	В
Pedestrian LOS	lestrian LOS Score / LOS														

Table 143. Wacker Dr and JFK Rd Saturday 4-5PM HCS 20-yr Projected Conditions Optimized

		HCS	Sigr	ialize	u inte	rsect	ion R	esul	ts Sun	ımary						
General Inform	ation								Intersec	tion Inf	o rmontic			I ad Juliada II	la L	
-	iation							\rightarrow			1.000		411			
Agency				l Amelia	in Data	Ιοιοοιο	004	\rightarrow	· ·							
Analyst				Analysis Date 2/20/2024 Time Period					Area Typ	e	Other				4	
Jurisdiction				_				\rightarrow	PHF		1.00		- 1 +		۴	
Urban Street					sis Year	_		_	Analysis		1> 12		_ 5			
Intersection		4-5pm Wacker/JFK		File Na	ame	Interse	ection (\	Wacke	r-JFK)_(overall_l	Delay_2	20yr.xus		ጎተት		
Project Descrip	tion													14147	P.M.	
Demand Inform	nation				EB			W	3	1	NB		1	SB		
Approach Move				L	T	R	L	T	_	L	T	R	1	Тт	R	
Demand (v), v				401	32	70	12	11	_	127	444	-	24	406	29	
Demand (V), V	CII/II			401	32	10	12		10	121	444	, J	24	400	23	
Signal Informa	tion				ΙŢ	T	IJ.	\top	<u></u>		\neg					
Cycle, s	59.7	Reference Phase	2	1	12	E45	Z 543	₂ ≤	\equiv			×	Φ		4	
Offset, s	0	Reference Point	End	1		<u> </u>	- :1	3				1	2	3	Y	
Uncoordinated	Yes	Simult. Gap E/W	On	Green Yellow		0.0	4.0	13. 3.0		0.0				7	→	
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	0.0	1.5	2.5	-	0.0		5	6	7		
Timer Results				EBI	_	EBT	WB	L	WBT	NBI		NBT	SBI	L	SBT	
Assigned Phase	е					4			8	5		2	1		6	
Case Number						10.0			10.0	1.1		4.0	1.1		4.0	
Phase Duration, s						18.7			8.4	11.0		26.2 6.4		4 21.		
Change Period,	(Y+R	c), S				5.5			5.5	5.0		5.5	5.0		5.5	
Max Allow Head		•			\neg	3.2	-	\neg	3.2	3.1		3.1	3.1	\neg	3.1	
Queue Clearan					$\overline{}$	12.0			2.9	8.0		17.0	2.5	-	10.6	
Green Extensio					\neg	1.0		\neg	0.0	0.0	_	3.4	0.0		3.4	
Phase Call Prof		(3-71-			-	1.00		\rightarrow	0.47	0.99	$\overline{}$	1.00	0.27	$\overline{}$	1.00	
Max Out Probal					-	0.00		\rightarrow	0.01	1.00	-	0.00	0.00	-	0.00	
													9.0			
Movement Gro	up Res	ults			EB			WB			NB			SB		
Approach Move	ment			L	Т	R	L	Т	R	L	Т	R	L	T	R	
Assigned Move	ment			7	4	14	3	8	18	5	2	12	1	6	16	
Adjusted Flow F	Rate (v), veh/h		201	303		12	26		290	514	512	19	295	25	
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n	1767	1723		1810	1649		1767	1856	1847	1767	1856	157	
Queue Service	Time (g s), S		6.0	10.0		0.4	0.9		6.0	15.0	15.0	0.5	8.3	8.6	
Cycle Queue C		-		6.0	10.0		0.4	0.9		6.0	15.0	15.0	0.5	8.3	8.6	
Green Ratio (g.	/C)			0.22	0.22		0.05	0.05		0.40	0.35	0.35	0.30	0.27	0.2	
Capacity (c), v	eh/h			392	382		87	79		415	649	646	198	508	43	
Volume-to-Capa		ntio (X)		0.512	0.792		0.138	0.328	3	0.700	0.792	0.792	0.096	0.581	0.59	
		t/In (95 th percentile	:)	105	175		7	16		107	203	197	8	142	12	
		eh/ln (95 th percenti		4.1	6.8		0.3	0.6		4.2	7.9	7.9	0.3	5.6	5.0	
		RQ) (95 th percent		0.21	0.35		0.00	0.37	_	0.21	0.41	0.40	0.02	0.00	0.0	
Uniform Delay (20.6	22.1		27.5	27.7	-	15.6	17.6	17.6	16.4	18.9	19.	
Incremental De				0.4	1.4		0.3	0.9	_	1.6	0.3	0.3	0.1	0.3	0.3	
Initial Queue De		*		0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (**		21.0	23.6		27.7	28.6		17.2	17.9	17.9	16.4	19.1	19.	
Level of Service				С	C		С	C		В	В	В	В	В	В	
Approach Delay				22.5		С	28.3		c	17.8		В	19.1		В	
Intersection Del							0.2			17.0			B			
	, 5, 5, 70															
	sults				EB			WB			NB			SB		
Multimodal Results										4.00	_	В			В	
Multimodal Re Pedestrian LOS	Score	/LOS		2.29)	В	2.29	9	В	1.90)	В	1.9	1	В	

Table 144. Wacker Dr and JFK Rd Saturday 5-6PM HCS Existing Conditions

			- 13					Jour	ts Sun	u. y					
General Inforn	nation								Intersec	tion Inf	on	Į.	4741	ЬL	
Agency								\rightarrow	Duration		···		411		
Analyst				Analys	sis Date	2/20/2	024	$\overline{}$	Area Type						
Jurisdiction				Time F		272072	-	\rightarrow	PHF		Other		→ +		<u></u>
Urban Street				_	is Year	2024	2024			Period	1> 12	-00	- ×		
Intersection		5-6pm Wacker/JFK		File Na		-	ection (\	_	r-JFK)-O						_
Project Descrip	tion	o-opin wackenorik		T IIC 14	anic	Interse	oction (1	rvaciic	1-01 10)-0	pumza	ion.xu3		-	4144	\$* [*]
r roject Besch	tion														
Demand Infor	mation				EB		Т	WE	3		NB		\top	SB	
Approach Move	ement			L	Т	R	L	Т	R	L	Т	R	L	Т	R
Demand (v), v	/eh/h			319	23	65	5	5	6	110	354	5	8	397	280
Signal Informa	ation				7				2		l				
Cycle, s	56.7	Reference Phase	2		7	150	7 SA	zŔ.	2			, ×	Ψ		- ⇔
Offset, s	0	Reference Point	End	Green	0.6	2.7	15.0	10.	6 1.3	0.0		1		3	Y K
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		3.5	4.0	3.0	3.0	0.0			<u> </u>	⋰	→
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.5	1.5	1.5	2.5	2.5	0.0		5	6	7	
Timer Results				EBI	-	EBT	WB	L	WBT	NBI	-	NBT	SBI	L	SBT
Assigned Phase						4			8	5		2	1		6
Case Number						10.0			10.0	1.1		4.0	1.1		4.0
Phase Duration	1, S					16.1			6.8	13.3	3	28.2	5.6		20.5
Change Period	, (Y+R	c), S				5.5			5.5	5.0		5.5	5.0		5.5
Max Allow Hea	dway (I	<i>МАН</i>), s				3.2			3.2	3.1	3.1		3.1		3.1
Queue Clearan	ce Time	(gs), S				9.8			2.4	7.9		13.0	2.2		12.3
Green Extension	n Time	(ge), S				8.0			0.0	0.5		3.1	0.0		2.5
Phase Call Pro	bability					1.00			0.22	0.99		1.00	0.12	2	1.00
Max Out Proba	bility					0.00			0.00	0.00		0.07	0.00)	0.39
Movement Gro	un Pas	ulte			EB			WB			NB			SB	
		buits		L	T	R	L	T	T R	L	T	R	L	T	R
Approach Move Assigned Move				7	4	14	3	8	18	5	2	12	1	6	16
		\ voh/h		160	248	14	5	11	10	277	454	451	8	361	316
Adjusted Flow			n	1767	1721		1810	1690		1767	1856	1846	1767	1856	1600
Queue Service		ow Rate (s), veh/h/l		4.6	7.8		0.2	0.4	-	5.9	11.0	11.0	0.2	10.1	10.3
		g s), s e Time (g ₀), s		4.6	7.8		0.2	0.4	+	5.9	11.0	11.0	0.2	10.1	10.3
Green Ratio (g		c mile (ge), s		0.19	0.19		0.02	0.4		0.45	0.40	0.40	0.28	0.26	0.26
Capacity (c), v				330	322		43	40	+	448	743	739	250	491	423
		atio (Y)		0.483	0.769		0.116	0.274		0.619	0.611	0.611	0.032	0.737	0.74
Volume-to-Cap			١	80	135		3	7	+	86	163	159	3	187	163
		t/In (95 th percentile		_					1		_		_	_	-
		eh/ln (95 th percent		3.1	5.3		0.1	0.3	+	3.4	6.4	6.4	0.1	7.3	6.5
		RQ) (95 th percent	iie)	0.16	0.27		0.00	0.15	-	0.17	0.33	0.33	0.01	0.37	0.33
Uniform Delay				0.4	21.9		27.1	27.2	+	12.4	13.5	13.5	15.3	19.1	19.1
Incremental Delay (d 2), s/veh					1.5		0.4	1.4	1	0.3	0.2	0.2	0.0	1.8	2.4
Initial Queue Delay (d 3), s/veh				0.0	0.0		0.0	0.0	+	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (21.0	23.4		27.6	28.6	+	12.7	13.7	13.7	15.3	20.9	21.
Level of Service				C	C	<u></u>	C	C		B	В	В	В	C	C
Approach Dela				22.5		C 17	28.3	5	С	13.5		В	21.1		С
Intersection De	iay, s/ve	en / LOS				17	.5						В		
Multimodal Pa	sulte				EB			WB			NB			SB	
Multimodal Results						В	2.29	_	В	1.89		В	1.91		В
Pedestrian LOS	Score			2.29											

HCS™ Streets Version 2024

Generated: 4/16/2024 7:09:56 PM

Table 145. Wacker Dr and JFK Rd Saturday 5-6PM HCS Existing Conditions Optimized

			· · · ·						ts Sun						
General Inform	ation								Intersec	tion Inf	ormatic	n n	T is	4244	p U
Agency	iauon								Duration		1.000			417	
Analyst				Analysis Date 2/20/2024					Area Ty	-	-				
Jurisdiction				Time Period					PHF	,,,	Other 1.00				4
Urban Street						2024		-		Dorind	1> 12	-00	- 10 mg		
Intersection		5 Com Wacker/ IEV		File Na	sis Year	+	action (Macke	Analysis						
Project Descrip	tion	5-6pm Wacker/JFK		Tile ive	anne	Interse	ection (vvacke	r-JFK)_(overall_	Delay_t	XISUII	-	4144	11
. 10,000 2 0000.15															
Demand Inform	nation				EB			W	3		NB			SB	
Approach Move	ment			L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), v	eh/h			319	23	65	5	5	6	110	354	0	8	397	28
Signal Informa	tion				ΙΙ	T		_	8		_				
Cycle, s	67.1	Reference Phase	2		7		- P	_ 🛂	闰			, l	12		
Offset, s	0	Reference Point	End		1	STI						1	2	3	Z
Uncoordinated	Yes	Simult. Gap E/W	On	Green		6.6	18.3	12.	-	0.0				,	A
Force Mode	Fixed	Simult. Gap L/W	On	Yellow Red	1.5	3.5 1.5	1.5	3.0 2.5		0.0) 5	6		~
, order widde	, IACU	Cantale Out 1470	Oil	IXCU	1.0	1.0	1.0	2.0	12.0	0.0					
Timer Results				EBI	-	EBT	WB	L	WBT	NB	L	NBT	SBI	_	SBT
Assigned Phase	е					4			8	5		2	1		6
Case Number						10.0			10.0	2.0		4.0	2.0		4.0
Phase Duration, s						17.7			8.1	17.6	5	35.3	6.0		23.8
Change Period,	(Y+R	c), S				5.5			5.5	5.0		5.5	5.0		5.5
Max Allow Head	dway (/	MAH), s			\neg	3.2		\neg	3.2	3.1		3.1	3.1	\neg	3.1
Queue Clearan	ce Time	e (gs), s				11.3			2.4	12.3	3	14.0	2.3		14.1
Green Extensio	n Time	(ge), S			\neg	0.7		\neg	0.0	0.2		4.0	0.0		4.0
Phase Call Prol	bability				-	1.00			0.26	0.99		1.00	0.14	1	1.00
Max Out Proba	bility					0.00			0.00	1.00		0.00	0.00		0.00
Manager Con					ED.			WD			ND			0.0	
Movement Gro	-	suits		L	EB T	R	L	WB T	T R	L	NB T	R	L	SB T	R
Approach Move				7	4	14	3	8	18	5	2	12	1	6	16
Assigned Move) voh/h			248	14	5	11	10	279	898	0	8	361	-
Adjusted Flow F			_	160			_	1690		_		0		_	310
-		ow Rate (s), veh/h/l	11	1767	1721		1810		<u>' </u>	1767	1856	_	1767	1856	160
Queue Service		S ,.		5.5	9.3		0.2	0.4	+	10.3	12.0	0.0	0.3	11.9	12.
Cycle Queue C		e τime (gε), s		5.5	9.3		0.2	0.4	+	10.3	12.0	0.0	0.3	11.9	12.
Green Ratio (g				0.18	0.18		0.04	0.04		0.19	0.44		0.01	0.27	0.2
Capacity (c), v		41- (34)		321	312		71	67	-	333	1656	0.000	26	506	43
Volume-to-Capa			`	0.497	0.792		0.070	0.16)	0.838	0.542	0.000	0.304	0.714	0.72
		t/In (95 th percentile	,	101	170		4	8	+	195	180	0	6	216	19
		eh/ln (95 th percenti		3.9	6.7		0.1	0.3		7.6	7.0	0.0	0.3	8.4	7.6
		RQ) (95 th percent	iie)	0.20	0.34		0.00	0.18		0.39	0.36	0.00	0.01	0.43	0.3
Uniform Delay (24.9	26.5		31.3	31.4	_	26.5	13.7	0.0	33.0	22.2	22.
Incremental De				0.4	1.8		0.2	0.4	-	8.1	0.1	0.0	2.4	0.7	0.9
Initial Queue De				0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (25.3	28.2		31.4	31.8		34.6	13.7		35.4	22.9	23.
Level of Service				C 07.4	С	<u> </u>	C	C		C	B		D	C	
Approach Delay				27.1		C 21	31.7		С	18.7		В	23.2	4	С
Intersection De	iay, S/Ve	en / LOS				21	1.6						С		
Multimodal Re	sults				EB			WB			NB			SB	
		/LOS		2.29	_	В	2.30	_	В	1.89		В	1.91	_	В
Pedestrian LOS					- 1										

Table 146. Wacker Dr and JFK Rd Saturday 5-6PM HCS 5-yr Projected Conditions Optimized

		1100	- Oigi	nalize				Jour			····ai y					
General Inform	nation								Inter	sect	ion Info	ormatic	n	l J	بإطهارات	ja lu
Agency									Duration, h 1.000						417	
Analyst				Analysis Date 2/20/2024					Area Type			Other				
Jurisdiction				Time Period					PHF			1.00		1 →		- 2
Urban Street				Analysis Year 2024						/sis	Period	1> 12	.00			
Intersection		5-6pm Wacker/JFK		File Na		-	ection (\	Nacke								_
Project Descrip	tion	5-opin wackersi k		I lic ive	anic	Interse	ction (vacke	21-01 F	()_0	vcraii_t	Delay_c	yı.xus	- 1	네 1 박무	P P
,																
Demand Inforr	nation				EB			W	В			NB			SB	
Approach Move	ement			L	Т	R	L	T		R	L	T	R	L	T	F
Demand (v), v	eh/h			338	24	68	5	5		6	116	373	1	8	418	29
Signal Informa	tion						1 11	7	Б			-				
Cycle, s	69.8	Reference Phase	2		2	D.A.	14.	. L3	爿				<u>,</u>	t		~
Offset, s	0	Reference Point	End		1	ST			\perp		4		1	2	3	Z
Uncoordinated	Yes	Simult. Gap E/W	On	Green		7.3	19.1	3.0	_	2.7	0.0				7	4
Force Mode	Fixed	Simult. Gap N/S	On	Yellow Red	1.5	3.5 1.5	1.5	2.5	-	3.0 2.5	0.0		5	6	-	~
. STOC MICUC	, ixed	C.mar. Oup 1470	011	1100			,	12.0			10.0					
Timer Results				EBI	-	EBT	WB	L	WB	Т	NBL	-	NBT	SBI		SBT
Assigned Phase	е					4			8		5		2	1		6
Case Number					1	10.0			10.0		2.0		4.0	2.0		4.0
Phase Duration, s					<u> </u>	18.6		\neg	8.2	\neg	18.3		36.9	6.0		24.6
Change Period	, (Y+R	c), S				5.5		\neg	5.5		5.0		5.5			5.5
Max Allow Head	dway (I	MAH), s				3.2			3.2	\neg	3.1		3.1	3.1		3.1
Queue Clearan	ce Time	e (gs), S			-	12.2			2.4		13.1		14.9	2.3		15.4
Green Extensio						0.8			0.0		0.1		3.6	0.0		3.6
Phase Call Pro	bability					1.00		İ	0.27	,	1.00		1.00	0.14	1	1.00
Max Out Proba	bility					0.00			0.00		1.00		0.00	0.00)	0.00
Mayamant Car	un De	ulte			EB			WE				NB			SB	
Movement Gro Approach Move	•	suits		L	T	R	L	T	_	7	L	T	R	L	T SB	F
Assigned Move				7	4	14	3	8	-	8	5	2	12	1	6	1
Adjusted Flow F) voh/h		169	261	14	5	11	+-'	-	288	465	465	8	382	33
		,	n	1767	1718		1810	1679	+	-	1767	1856	1854	1767	1856	15
		ow Rate (s), veh/h/l		_	10.2		0.2	0.4	-		_	12.9	12.9	0.3	13.2	13
Queue Service				6.0	10.2		0.2	0.4	\rightarrow		11.1	12.9	12.9	0.3	13.2	13
Cycle Queue C		e mile (ge), s		0.19	0.19		0.2	0.04	_		0.19	0.45	0.45	0.01	0.27	0.3
Green Ratio (g Capacity (c), v				333	323		71	66	+		339	839	838	26	510	43
		atio (X)		0.508	0.807		0.071	0.16	7		0.849	0.555	0.555	0.304	0.749	0.7
Volume-to-Cap			١	112	188		4	8	<u> </u>		210	192	187	7	237	20
		t/In (95 th percentile		4.4	7.4		0.1	0.3	+		8.2	7.5	7.5	0.3	9.3	8.
		eh/In (95 th percent		0.22	0.38		0.00	0.19	\rightarrow		0.42	0.38	0.38	0.3	0.47	0.4
Uniform Delay (RQ) (95 th percent	iie)	25.6	27.3		32.5	32.7	-		27.4	14.1	14.1	34.3	23.3	23
Incremental De				0.4	1.9		0.2	0.4	\rightarrow		9.7	0.1	0.1	2.4	0.8	1.
Initial Queue De				0.4	0.0		0.2	0.4	-		0.0	0.0	0.0	0.0	0.0	0.
Control Delay (26.1	29.2		32.7	33.1	\rightarrow		37.2	14.2	14.2	36.7	24.1	24
Level of Service				C C	29.2 C		32.1	33.	+		D D	14.2 B	14.2 B	36.7 D	C C	24
				28.0		С	33.0		C		19.7		B	24.4		
Approach Delay Intersection De				20.0		22		,	C	-	19.7			C 24.4	•	C
cracction De	.ay, arve	200														
Multimodal Re	sults				EB			WE	1		NB				SB	
Pedestrian LOS	Score	/LOS		2.30		В	2.30		В		1.89		В	1.91	1	В
	_	os		1.20		Α	0.51		Α		0.89		Α	1.08		Α

Table 147. Wacker Dr and JFK Rd Saturday 5-6PM HCS 10-yr Projected Conditions Optimized

			5.							nmary						
General Informat	tion								Intersec	tion Infe	ormatic	n n	1 2	4744	la lu	
Agency	LIOII								Duration			417				
Analyst				Analysis Date 2/20/2024					Area Typ	,	1.000 Other		- 2			
Jurisdiction				Time F		2/20/2	024		PHF	,e	1.00				د	
	-					2024	0004			Dorind	11111	-00			•	
Urban Street		Co 10/2 - 10-2/ IEI/			is Year	2024 Intersection (Wacke			Analysis		1> 12		- B			
Intersection	_	6pm Wacker/JFK		File Na	ime	Interse	ection (v	wacke	er-JFK)_C	overali_l	Delay_1	ioyr.xus	- 4	<u> ጎተታ</u>	14.5	
Project Descriptio	on			_			_	_	_	_		_		N I AF 1	M)III	
Demand Informa	ation				EB	_		W	R		NB			SB	_	
Approach Movem				L	T	T R	1	T		1	T	T R	1	ΤŢ	T	
Demand (v), veh				393	28	79	6	6		134	433	9	10	486	34	
Demand (v), ven	1/11			333	20	13	-		-	154	400	9	10	400	34	
Signal Information	on				T.	Т		т	F	$\overline{}$	П					
		eference Phase	2	1	S	F.A.		ıK.	Ħ		•	_	₩			
Offset, s		teference Point	End		()	517			0 1.5	100		1	2	3	7	
_		imult. Gap E/W	On	Green Yellow		1.2 3.5	20.4 4.0	3.0		0.0				7	Ð	
	-	imult. Gap N/S	On	Red	1.5	1.5	1.5	2.5		0.0		5	6	7		
									,	, , , ,						
Timer Results				EBL		EBT	WB	L	WBT	NBI		NBT	SBI		SBT	
Assigned Phase						4			8	5		2	1		6	
Case Number						10.0		\rightarrow	10.0	1.1		4.0	1.1	\rightarrow	4.0	
Phase Duration, s					$\overline{}$	19.5		\neg	7.3	12.0	,	32.1	5.8	-	25.9	
Change Period, (S			\rightarrow	5.5		\rightarrow	5.5	5.5 5.0		5.5	5.0		5.5	
Max Allow Headw					-	3.2	_	\rightarrow	3.2	3.1		3.1	3.1		3.1	
Queue Clearance					-	12.9		\rightarrow	2.5	9.0		15.9	2.2		16.1	
Green Extension		J ,.			_	1.0		_	0.0	0.0	_	4.1	0.0	_	4.1	
Phase Call Proba		e), 3		_	$\overline{}$	1.00	_	\rightarrow	0.29	1.00		1.00	0.17	-	1.00	
Max Out Probabili					\rightarrow	0.00		\rightarrow	0.00	1.00	_	0.00	1.00	-	0.00	
max out i robubil	ii.y					3.00			0.00	1.00		0.00	1.00		0.00	
Movement Group	p Result	ts			EB			WE	3		NB			SB		
Approach Movem	nent			L	Т	R	L	Т	R	L	Т	R	L	Т	R	
Assigned Moveme	ent			7	4	14	3	8	18	5	2	12	1	6	16	
Adjusted Flow Ra		veh/h		197	304		6	13		299	496	492	10	446	38	
Adjusted Saturation			n	1767	1717		1810	1669	9	1767	1856	1841	1767	1856	158	
Queue Service Tir		V 1		6.4	10.9		0.2	0.5		7.0	13.9	13.9	0.2	14.1	14	
Cycle Queue Clea		,-		6.4	10.9		0.2	0.5		7.0	13.9	13.9	0.2	14.1	14	
Green Ratio (g/C				0.22	0.22		0.03	0.03	_	0.46	0.41	0.41	0.33	0.32	0.3	
Capacity (c), veh				385	374		49	46		368	762	757	226	586	50	
		(X)		0.511	0.812		0.121	0.28	5	0.814	0.650	0.650	0.044	0.761	0.7	
Volume-to-Capacity Ratio (X))	114	195		4	10	1	132	198	192	4	241	20	
	Back of Queue (Q), ft/ln (95 th percentile)			4.4	7.6		0.2	0.4		5.2	7.7	7.7	0.2	9.4	8.	
Back of Queue (0	Q), veh/	Back of Queue (Q), veh/ln (95 th percentile) Queue Storage Ratio (RQ) (95 th percentile)					_	0.21		0.27	0.40	0.39	0.01	0.48	0.4	
Back of Queue (C Back of Queue (C		<u> </u>		0.23	0.39		0.00			_				20.0	20	
Back of Queue (0 Back of Queue (0 Queue Storage R	atio (R	Q) (95 th percent		-			_	31 ()	15.2	15.4	15.4	15.5			
Back of Queue (0 Back of Queue (0 Queue Storage R Uniform Delay (<i>d</i>	atio (R0	Q) (95 th percent th		22.4	24.1		30.8	31.0		15.2 7.0	15.4 0.2	15.4 0.2	15.5 0.0		0	
Back of Queue (0 Back of Queue (0 Queue Storage R Uniform Delay (<i>d</i> Incremental Delay	Ratio(R0 11), s/ve y(d2),	Q)(95 th percent th s/veh		22.4 0.4	24.1 1.7		30.8 0.4	1.3		7.0	0.2	0.2	0.0	0.8	-	
Back of Queue ((Back of Queue ((Queue Storage R Uniform Delay (<i>d</i> Incremental Delay Initial Queue Dela	Ratio (RO 11), s/ve y (d2), ay (d3),	Q)(95 th percent th s/veh		22.4 0.4 0.0	24.1 1.7 0.0		30.8 0.4 0.0	1.3 0.0		7.0 0.0	0.2	0.2	0.0	0.8	0.	
Back of Queue (() Back of Queue (() Queue Storage R Uniform Delay (d Incremental Delay Initial Queue Dela Control Delay (d)	Ratio (RO d 1), s/ve y (d 2), ay (d 3),), s/veh	Q)(95 th percent th s/veh		22.4 0.4 0.0 22.8	24.1 1.7 0.0 25.8		30.8 0.4 0.0 31.2	1.3 0.0 32.2		7.0 0.0 22.1	0.2 0.0 15.5	0.2 0.0 15.6	0.0 0.0 15.5	0.8 0.0 20.8	0. 20	
Back of Queue ((Back of Queue ((Queue Storage R Uniform Delay (d Incremental Delay Initial Queue Dela Control Delay (d Level of Service (l	Ratio (RC d 1), s/ve y (d 2), ay (d 3),), s/veh (LOS)	Q)(95 th percent th s/veh , s/veh		22.4 0.4 0.0 22.8 C	24.1 1.7 0.0 25.8 C		30.8 0.4 0.0 31.2 C	1.3 0.0 32.2 C	2	7.0 0.0 22.1 C	0.2 0.0 15.5 B	0.2 0.0 15.6 B	0.0 0.0 15.5 B	0.8 0.0 20.8 C	0. 20	
Back of Queue ((Back of Queue ((Queue Storage R Uniform Delay (d Incremental Delay Initial Queue Dela Control Delay (d Level of Service (I Approach Delay, s	Ratio (RC I 1), s/ve y (d 2), ay (d 3),), s/veh (LOS) s/veh / L	Q) (95 th percent ch s/veh , s/veh		22.4 0.4 0.0 22.8	24.1 1.7 0.0 25.8 C	C	30.8 0.4 0.0 31.2 C	1.3 0.0 32.2 C		7.0 0.0 22.1	0.2 0.0 15.5 B	0.2 0.0 15.6 B	0.0 0.0 15.5 B	0.8 0.0 20.8 C	0. 20	
Back of Queue ((Back of Queue ((Queue Storage R Uniform Delay (d Incremental Delay Initial Queue Dela Control Delay (d Level of Service (I Approach Delay, s	Ratio (RC I 1), s/ve y (d 2), ay (d 3),), s/veh (LOS) s/veh / L	Q) (95 th percent ch s/veh , s/veh		22.4 0.4 0.0 22.8 C	24.1 1.7 0.0 25.8 C		30.8 0.4 0.0 31.2 C	1.3 0.0 32.2 C	2	7.0 0.0 22.1 C	0.2 0.0 15.5 B	0.2 0.0 15.6 B	0.0 0.0 15.5 B	0.8 0.0 20.8 C	0. 0. 20 C	
Back of Queue ((Back of Queue ((Queue Storage R Uniform Delay (d Incremental Delay Initial Queue Dela Control Delay (d Level of Service (I Approach Delay, s Intersection Delay	Ratio (RC d 1), s/ve y (d 2), ay (d 3),), s/veh (LOS) s/veh / L y, s/veh	Q) (95 th percent ch s/veh , s/veh		22.4 0.4 0.0 22.8 C	24.1 1.7 0.0 25.8 C		30.8 0.4 0.0 31.2 C	1.3 0.0 32.2 C	C	7.0 0.0 22.1 C	0.2 0.0 15.5 B	0.2 0.0 15.6 B	0.0 0.0 15.5 B	0.8 0.0 20.8 C	0. 20	
Back of Queue ((Back of Queue ((Queue Storage R Uniform Delay (d Incremental Delay Initial Queue Dela Control Delay (d Level of Service (I Approach Delay, s	atio (RC f 1), s/ve y (d 2), ay (d 3),), s/veh (LOS) s/veh / L y, s/veh /	Q) (95 th percent th s/veh , s/veh		22.4 0.4 0.0 22.8 C	24.1 1.7 0.0 25.8 C		30.8 0.4 0.0 31.2 C	1.3 0.0 32.2 C	C	7.0 0.0 22.1 C	0.2 0.0 15.5 B	0.2 0.0 15.6 B	0.0 0.0 15.5 B	0.8 0.0 20.8 C	0. 20	

Table 148. Wacker Dr and JFK Rd Saturday 5-6PM HCS 20-yr Projected Conditions Optimized

	псэ	Sigi	ialize	u IIILE	15661	IUII K	csu	ts Sur	ııııaı y		_	_			
•										4.				WHI	
General Information							_	Intersed				- É	410	\$0 II.	
Agency			Analysis Data lamaines					Duration	<u> </u>	1.000					
Analyst			Analysis Date 2/20/2024					Area Ty	oe	Other		_ ÷,			
Jurisdiction			Time F	Period				PHF		1.00		± +		· ·	
Urban Street			Analys	is Year	2024			Analysis	Period	1> 12	:00	70			
Intersection	5-6pm Wacker/JFK		File Na	ame	Inters	ection (\	Nack	er-JFK)_	Overall_	Delay_2	0yr.xus		ጎተት		
Project Description												1	4144	Þſſ	
Demand Information				EB			W	B		NB			SB		
Approach Movement				T	T R	1	T 7	_	1	T	R		Τ	R	
Demand (v), veh/h			393	28	79	6	1		134	433	5	10	486	342	
Belliana (V), Velim			030	20	13			01	104	400		10	400	042	
Signal Information				Ţ			Τ.,	2	\Box						
Cycle, s 80.1	Reference Phase	2	1	7	543	Z 5:11	z⊭	2			∠	Ψ	-	-	
Offset, s 0	Reference Point	End	Green	10	6.4	24.5	16	.7 5.0	0.0		1	2	3	<u> </u>	
Uncoordinated Yes	Simult. Gap E/W	On	Yellow		3.5	4.0	3.0		0.0	-			7	→	
Force Mode Fixed	Simult. Gap N/S	On	Red	1.5	1.5	1.5	2.5	-	0.0		5	6	7		
Timer Results			EBL	-	EBT	WB	L	WBT	NB	_	NBT	SBI	-	SBT	
Assigned Phase					4			8	5		2	1		6	
Case Number					10.0			10.0	1.1	4.0		1.1		4.0	
Phase Duration, s					22.2			10.5	17.4	41.3		6.0		30.0	
Change Period, (Y+R	c), S				5.5			5.5	5.0		5.5			5.5	
Max Allow Headway (MAH), s				3.2				3.1	3.1		3.1		3.1	
Queue Clearance Time	e (g s), S				15.7				11.6	5 20.5		2.3		19.8	
Green Extension Time	(ge), S			\neg	0.9		\neg	0.0	0.6		4.5			4.5	
Phase Call Probability					1.00		\neg	0.83	1.00		1.00	0.20		1.00	
Max Out Probability					0.00			1.00	0.00	_	0.00			0.01	
Movement Group Res	sults			EB			WE	_		NB			SB		
Approach Movement			L	T	R	L	T	R	L	T	R	L	T	R	
Assigned Movement			7	4	14	3	8	18	5	2	12	1	6	16	
Adjusted Flow Rate (v	,-		197	304		6	73		333	546	544	10	447	381	
Adjusted Saturation Flo	ow Rate (s), veh/h/ln		1767	1715		1810	153	_	1767	1856	1847	1767	1856	1573	
Queue Service Time (8.0	13.7		0.3	3.8	\rightarrow	9.6	18.5	18.5	0.3	17.7	17.8	
Cycle Queue Clearanc	e Time (<i>g</i> _c), s		8.0	13.7		0.3	3.8	_	9.6	18.5	18.5	0.3	17.7	17.8	
Green Ratio (g/C)			0.21	0.21		0.06	0.06	5	0.49	0.45	0.45	0.32	0.31	0.31	
Capacity (c), veh/h			370	359		113	95		420	833	829	211	568	482	
Volume-to-Capacity Ra	itio (X)		0.532	0.846		0.053	0.76	5	0.794	0.656	0.656	0.047	0.788	0.790	
Back of Queue (Q), f	t/In (95 th percentile)		150	242		5	69		139	255	248	6	306	263	
Back of Queue (Q), v	eh/ln (95 th percentile	2)	5.9	9.5		0.2	2.7		5.4	10.0	9.9	0.2	11.9	10.5	
Queue Storage Ratio (RQ) (95 th percentile	e)	0.30	0.48		0.00	1.53	3	0.28	0.51	0.51	0.01	0.61	0.54	
Uniform Delay (d 1), s	/veh		28.3	30.6		35.5	37.2	2	16.9	17.3	17.3	19.3	25.5	25.6	
Incremental Delay (d a			0.4	2.2		0.1	4.9		0.5	0.1	0.1	0.0	0.9	1.1	
Initial Queue Delay (d			0.0	0.0		0.0	0.0	_	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/v			28.8	32.8		35.6	42.0	-	17.5	17.5	17.5	19.3	26.5	26.7	
Level of Service (LOS)			С	С		D	D		В	В	В	В	С	С	
Approach Delay, s/veh			31.2		С	41.5	_	D	17.5		В	26.5		С	
Intersection Delay, s/ven			72			3.2						C			
Intersection Delay, Sive															
microccion Delay, 3/VC				EB			WE	3		NB			SB		
Multimodal Results									_						
	/LOS		2.30		В	2.31	_	В	1.90		В	1.92	_	В	

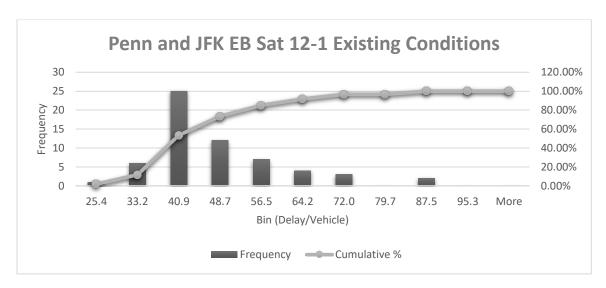
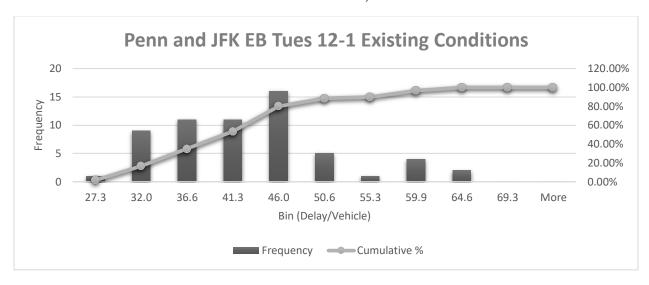


Figure 6. The total delay/vehicle the Penn and JFK intersection going eastbound experienced during the 60 simulation runs from 12-1 on a Saturday.



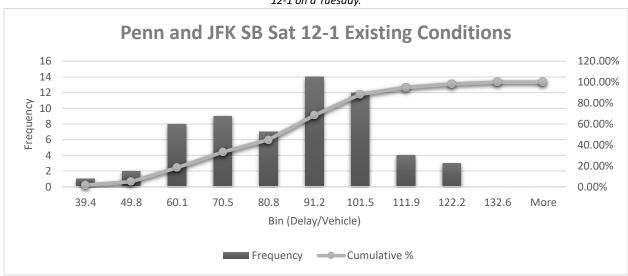


Figure 7. The total delay/vehicle the Penn and JFK intersection going eastbound experienced during the 60 simulation runs from 12-1 on a Tuesday.

Figure 8. The total delay/vehicle the Penn and JFK intersection going southbound experienced during the 60 simulation runs from 12-1 on a Saturday.

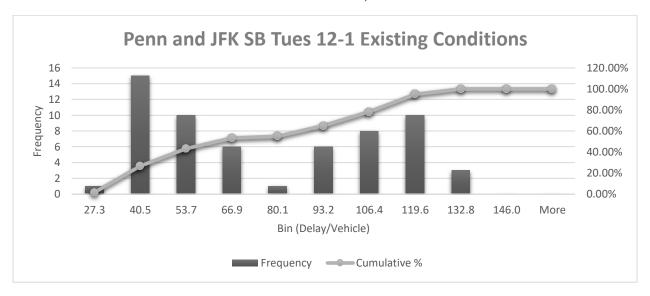


Figure 11. The total delay/vehicle the Penn and JFK intersection going southbound experienced during the 60 simulation runs from 12-1 on a Saturday.

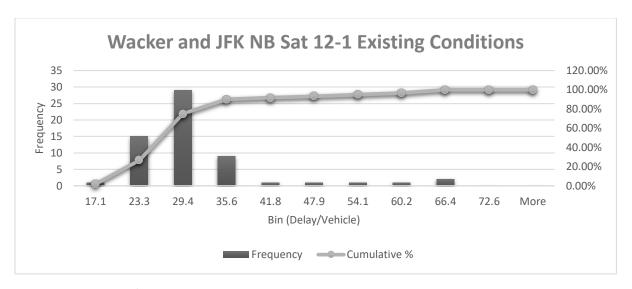


Figure 10. The total delay/vehicle the Wacker and JFK intersection going northbound experienced during the 60 simulation runs from 12-1 on a Saturday.

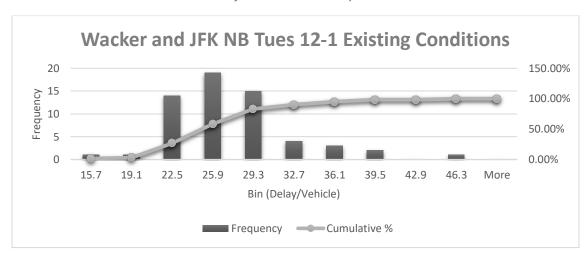


Figure 11. The total delay/vehicle the Wacker and JFK intersection going northbound experienced during the 60 simulation runs from 12-1 on a Tuesday.

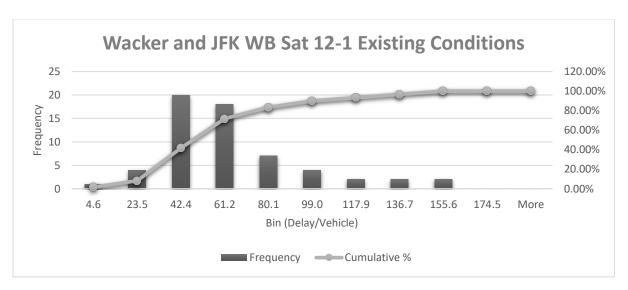


Figure 12. The total delay/vehicle the Wacker and JFK intersection going westbound experienced during the 60 simulation runs from 12-1 on a Saturday.

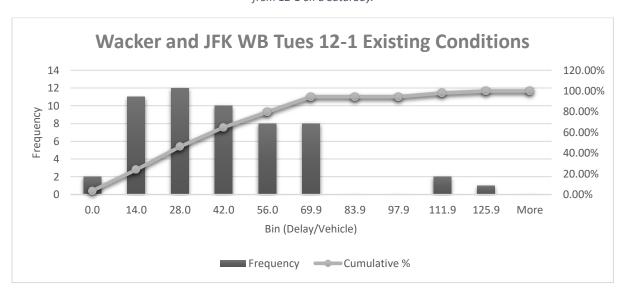


Figure 13. The total delay/vehicle the Wacker and JFK intersection going westbound experienced during the 60 simulation runs from 12-1 on a Tuesday.

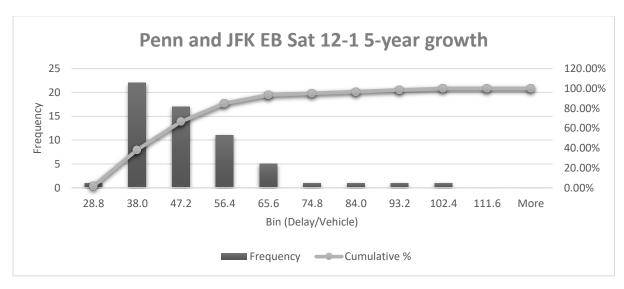


Figure 16. The total delay/vehicle the Penn and JFK intersection going eastbound experienced during the 60 simulation runs from 12-1 on a Saturday with a 5-year population growth.

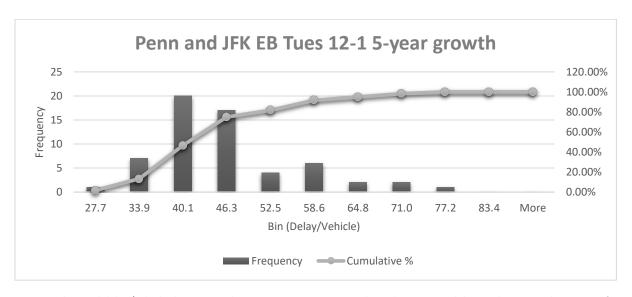


Figure 17. The total delay/vehicle the Penn and JFK intersection going eastbound experienced during the 60 simulation runs from 12-1 on a Tuesday with a 5-year population growth.

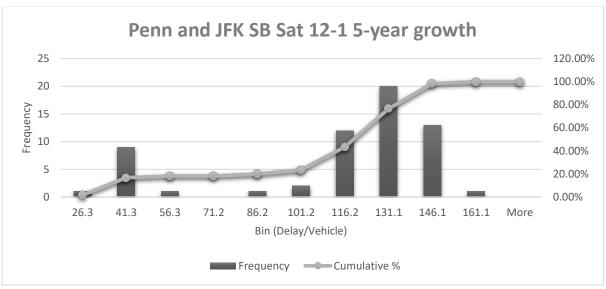


Figure 18. The total delay/vehicle the Penn and JFK intersection going southbound experienced during the 60 simulation runs from 12-1 on a Saturday with a 5-year population growth.

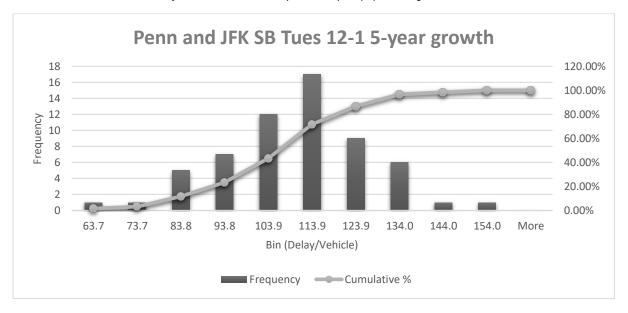


Figure 19. The total delay/vehicle the Penn and JFK intersection going southbound experienced during the 60 simulation runs from 12-1 on a Tuesday with a 5-year population growth.

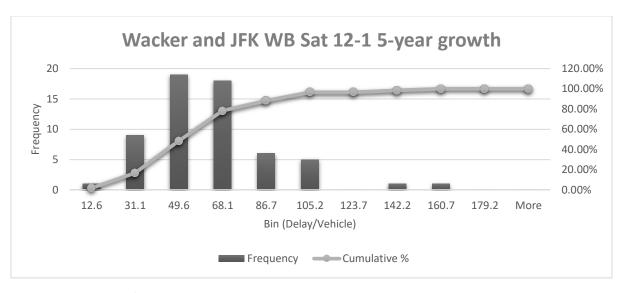


Figure 20. The total delay/vehicle the Wacker and JFK intersection going westbound experienced during the 60 simulation runs from 12-1 on a Saturday with a 5-year population growth.

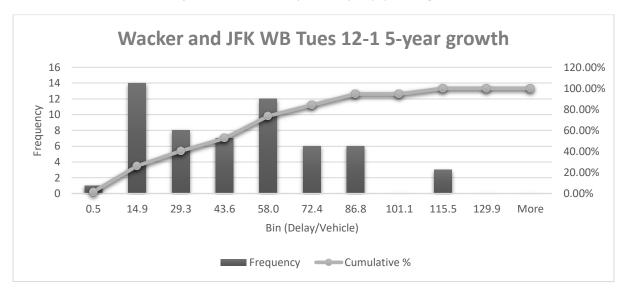


Figure 21. The total delay/vehicle the Wacker and JFK intersection going westbound experienced during the 60 simulation runs from 12-1 on a Tuesday with a 5-year population growth.

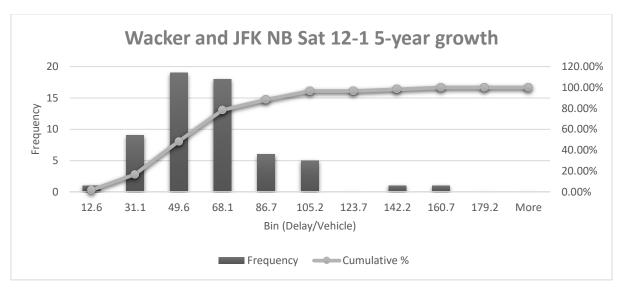


Figure 22. The total delay/vehicle the Wacker and JFK intersection going northbound experienced during the 60 simulation runs from 12-1 on a Saturday with a 5-year population growth.

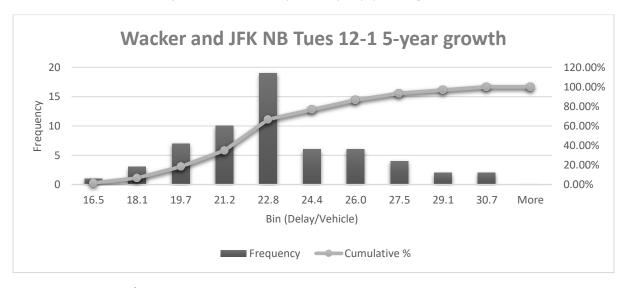


Figure 23. The total delay/vehicle the Wacker and JFK intersection going northbound experienced during the 60 simulation runs from 12-1 on a Tuesday with a 5-year population growth.

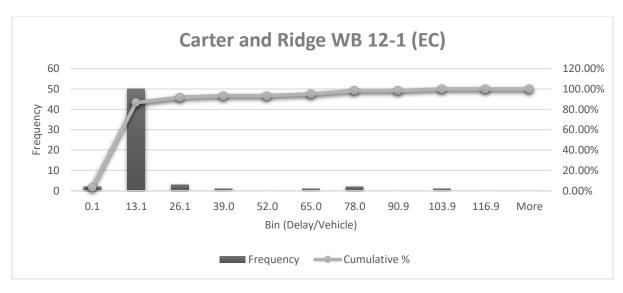


Figure 25. The total delay/vehicle the Carter and Ridge intersection going westbound experienced during the 60 simulation runs from 12-1 on a Saturday.

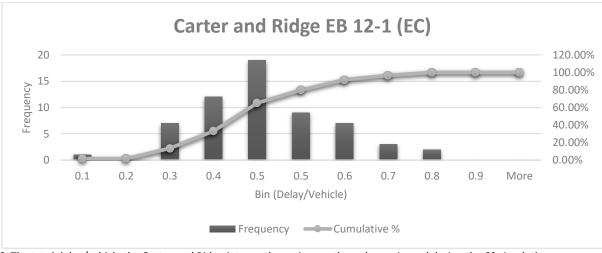


Figure 26. The total delay/vehicle the Carter and Ridge intersection going eastbound experienced during the 60 simulation runs from 12-1 on a Saturday.

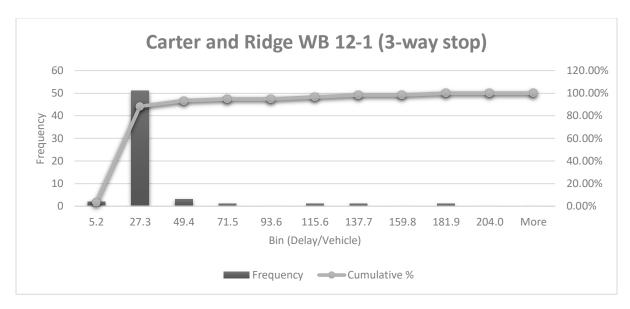


Figure 27. The total delay/vehicle the Carter and Ridge intersection with a 3-way stop going westbound experienced during the 60 simulation runs from 12-1 on a Saturday.

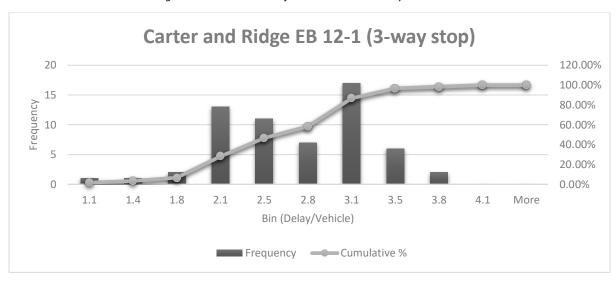


Figure 28. The total delay/vehicle the Carter and Ridge intersection with a 3-way stop going eastbound experienced during the 60 simulation runs from 12-1 on a Saturday.

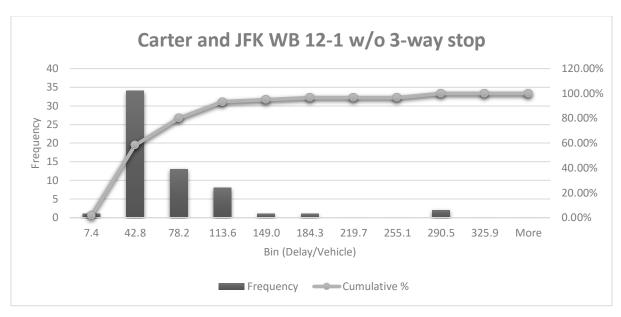


Figure 29. The total delay/vehicle the Carter and JFK intersection without a 3-way stop going westbound experienced during the 60 simulation runs from 12-1 on a Saturday.

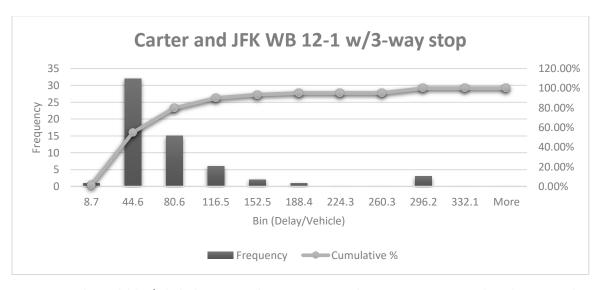


Figure 30. The total delay/vehicle the Carter and JFK intersection with a 3-way stop going westbound experienced during the 60 simulation runs from 12-1 on a Saturday.

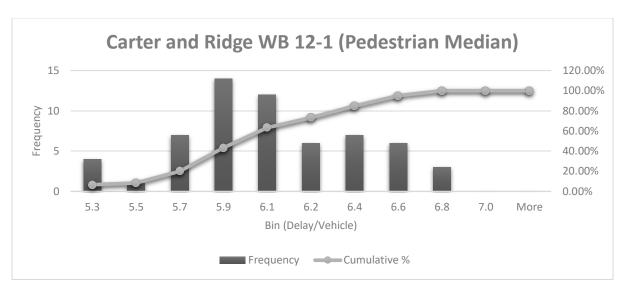


Figure 31. The total delay/vehicle the Carter and Ridge intersection with a pedestrian median going westbound experienced during the 60 simulation runs from 12-1 on a Saturday.

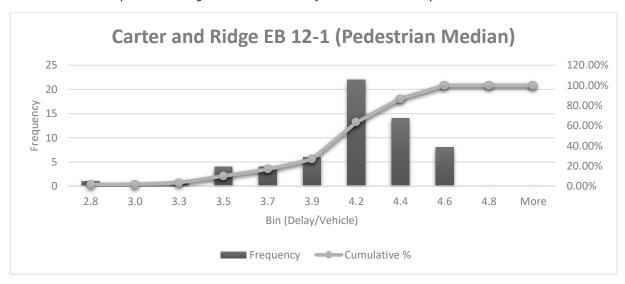


Figure 32. The total delay/vehicle the Carter and Ridge intersection with a pedestrian median going eastbound experienced during the 60 simulation runs from 12-1 on a Saturday.

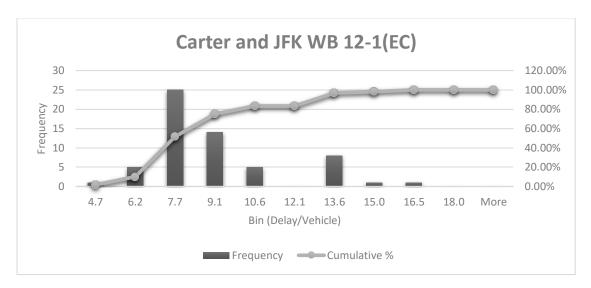


Figure 33. The total delay/vehicle the Carter and JFK intersection with a pedestrian median going westbound experienced during the 60 simulation runs from 12-1 on a Saturday.

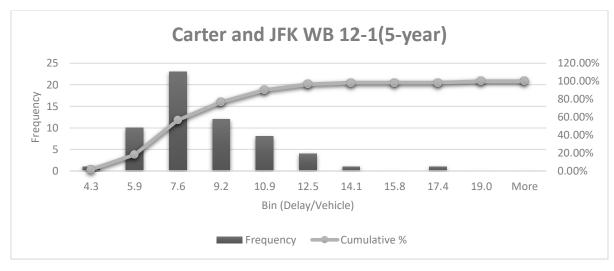


Figure 34. The total delay/vehicle the Carter and JFK intersection with a pedestrian median going westbound experiences 5 years from now during the 60 simulation runs from 12-1 on a Saturday.

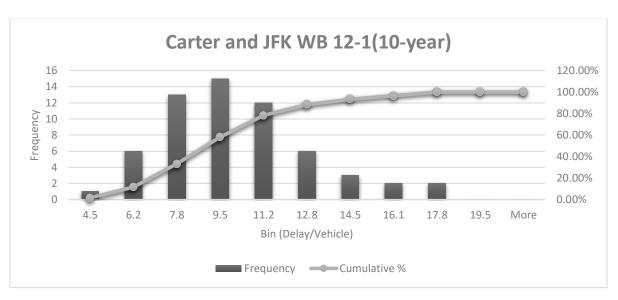


Figure 35. The total delay/vehicle the Carter and JFK intersection with a pedestrian median going westbound experiences 10 years from now during the 60 simulation runs from 12-1 on a Saturday.

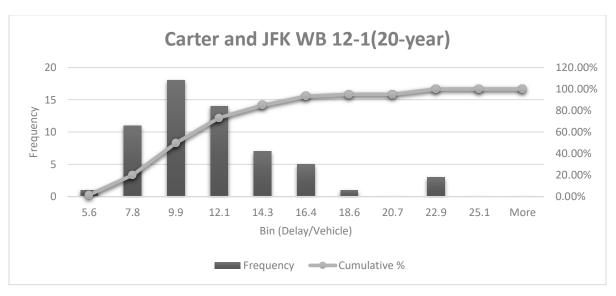


Figure 36. The total delay/vehicle the Carter and JFK intersection with a pedestrian median going westbound experiences 20 years from now during the 60 simulation runs from 12-1 on a Saturday.

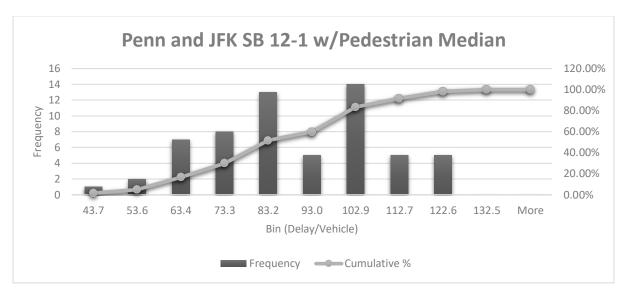


Figure 37. The total delay/vehicle the Pennsylvania and JFK intersection with a pedestrian median going southbound experienced during the 60 simulation runs from 12-1 on a Saturday.

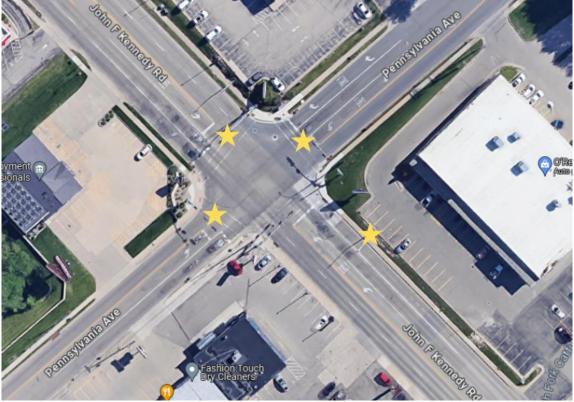


Figure 4. Aerial view displaying the location of cameras used to analyze the JFK Rd. and Pennsylvania Ave. intersection.

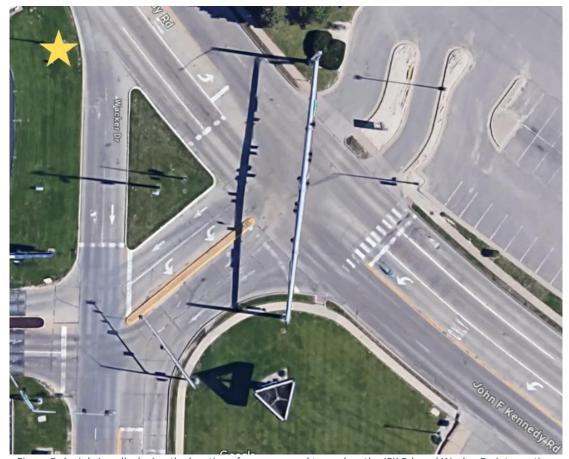


Figure 5. Aerial view displaying the location of cameras used to analyze the JFK Rd. and Wacker Dr. intersection.



Figure 24. Aerial view of the routes likely to be taken by parents dropping children off at school if the pedestrian median at Carter Rd. and JFK Rd is constructed.

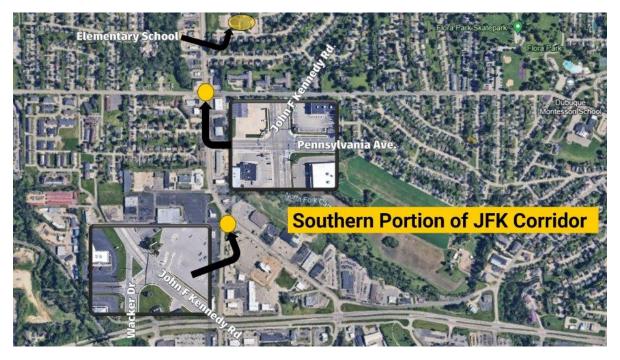


Figure 44. Key points of concern along the John F Kennedy Rd Corridor.