BURGESS & NIPLE Memorandum

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To: Mr. Butch Kotcamp **Date:** September 3, 2012
From: Steve Thieken, PE, PTOE

Subject: Technical Memorandum

Addendum to *Traffic Study of Street Closures and Campus Expansion*

This technical memorandum serves as an addendum to the Burgess & Niple (B&N) report dated June 28, 2010 and entitled *Traffic Study of Street Closures and Campus Expansion*, which was completed for Shawnee State University (SSU) and developed per the instructions of the Portsmouth City Engineer at the time (Jeffery Peck, PE). The 2010 report was submitted to SSU and the City of Portsmouth (the City). SSU has requested from B&N additional analysis to address comments received from the City and other questions that have been raised since the completion of the study.

The request for additional analysis includes:

A. Verification of the traffic estimates in the 2010 study
B. Addressing 12 requests for additional information and/or questions related to the findings of the 2010 study.

The following sections address each of these requests. The narrative that follows is intended to be an executive summary level discussion of the issues and findings. Supporting technical data and analysis is included as appendices to the memorandum.

A. Verification of the Traffic Estimates in the 2010 Study

Because of the timing of the request for the 2010 traffic study (after spring classes had ended), the traffic volume counts used for the study were collected during SSU's summer session and were then adjusted to estimate volumes during the regular (non-summer) sessions. The methodology for that increase is documented in the 2010 report. As part of this addendum, traffic counts were performed in April of 2012 at the intersection of SSU's primary entrance from 3rd Street, and the intersection of Waller Street and 3rd Street. These counts are included in Appendix J in their raw form. A summary of the comparison of the counts is included in Appendix A.

The counts reveal that for most traffic movements the 2010 study overestimated the amount of university traffic that is generated during the regular sessions of SSU. This means that the actual traffic impacts of the closure of Third Street on Fourth Street should be less than predicted by the 2010 study.

B. Follow-up Questions from SSU and City

1. Please include in the traffic study the VRCFA pedestrian traffic at evening events when we do not have police directing traffic.

SSU staff has indicated that the primary issue is a concern for the safety of pedestrians crossing Third Street at Gay Street (those who have parked north of Third Street). The problem stems from both the relatively high speed of traffic approaching from the west and the fact that vehicles that appear to be turning left onto Gay Street will sometimes change lanes at the last minute and continue straight on Third Street. This situation causes confusion and a potentially unsafe condition for the pedestrian. The figure on the following page illustrates a potential solution to this problem.

The proposed solution includes reducing the eastbound approach to the intersection of Third Street and Gay Street to a single lane (shared through/left/right) to eliminate the last second lane changing behavior. The traffic operations (see 2010 study for traffic volumes) for this alternative configuration were analyzed using Highway Capacity Software analysis (see Appendix B), which indicates that traffic operations would continue to be excellent (with very little additional delay due to eliminating the eastbound lane).

The excess lane on the curved roadway that connects northbound Chillicothe Street to Third Street could be striped-out with paint or could be converted to on-street parking spaces. Either of these options for eliminating the second lane would also serve to reduce travel speeds on this connecting roadway. The option with on-street parking would likely result in a greater speed reduction than just striping-out the lane due to the more visually "constrained" travel corridor that would result (drivers will feel less comfortable driving at higher speeds).

In this proposed solution the single eastbound lane would line up with the through lane on Third Street and the yellow striping just east of the intersection would be removed. The on-street parking could be continued east of Gay Street to meet the existing on-street parking if desired.

Additional enhancements under this scenario are:

- Install warning signs (in advance of and at the crossing) for pedestrian crosswalk
- Provide pavement markings with greater visibility for the crosswalk
- Consider the use of rapid flashing beacons (see figure below) in conjunction with crosswalk signage
- Test street lighting to ensure appropriate intensity and coverage exist to adequately illuminate crosswalk

Example of Rapid Flashing Beacon on Crosswalk Sign

Potential VRCFA Solution

It should be noted that if Third Street is closed between Gay Street and Waller, these improvements are not necessary to improve the situation since the vehicular/pedestrian conflicts at this crosswalk would be eliminated.

2. How will university traffic, and possible increased traffic, affect Glover Street and 4th Streets?

To address this question, traffic counts were performed at the intersection of Glover and Fourth Streets in April 2012. Using the same methodology used for the 2010 study, anticipated traffic volumes at this location after the closure of Third Street between Gay Street and Waller Street were estimated. The study assumes that all traffic that currently uses Third Street will shift to Fourth Street. Traffic operational analyses were performed using the estimated post-Third Street closure volumes on Fourth Street.

The results of the analysis show that while traffic volumes on Fourth Street will obviously increase, the traffic operations at the intersection of Fourth Street and Glover Street are still expected to be excellent under the current intersection design, and no improvements to that intersection are required to ensure efficient vehicular access to and from Fourth Street.

See Appendix C for the traffic volume data and analysis.

3. What times of the day do we have heavier traffic?

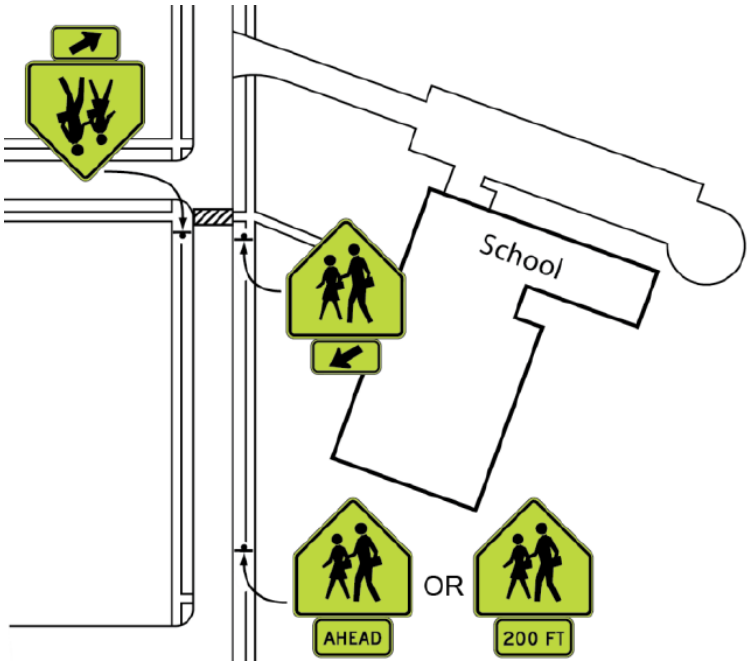
The heaviest hours of daily traffic were identified from traffic counts in the 2010 report as on weekdays from approximately 7:30-8:30 a.m. and 4:30-5:30 p.m., respectively. While the hourly volumes are highest during the hours indicated above, there are short peaks throughout the day corresponding with SSU class change times. See Appendix D for a graph of the daily pattern of traffic on Third Street.

4. How many elementary students walk south of Gallia Street towards University traffic (Union, Waller, and Glover Streets)?

The volume of pedestrians crossing and walking adjacent to Fourth Street at Union Street, Waller Street, and Glover Street was observed and collected in April of 2012 on a day when Portsmouth schools were in session (with pleasant weather). The pedestrian counts were taken specifically during school arrival and dismissal times (7:15 a.m. to 9:00 a.m. and 2:15 p.m. to 3:30 p.m., respectively). The diagrams in Appendix E illustrate these pedestrian volumes. The counts indicate that a relatively small number of students currently cross Fourth Street during in the morning and afternoon periods. The maximum number of crossings of Fourth Street at any one location during either the a.m. or the p.m. observation period was five students. While this is not a large number of crossing students, it should be noted that after the closure of Third Street there will be fewer natural gaps in traffic for students to cross Fourth Street at these locations due to the increase of traffic.

The traffic signal at Waller Street provides a preferred location for students to cross. We suggest that consideration be given to improving the traffic signal at this location to include pedestrian signal indications (walk/don't walk signals). We also suggest that consideration be given to improving the visibility of the crosswalks at Union Street and Glover Street. Improvements should include adding improved school crossing warning signage (florescent green); addition of advanced school crossing signage, and improve the pavement markings to better highlight the current crossing locations. All of these improvements should be completed in accordance with the Ohio Manual of Uniform Traffic Control Devices (see example below).

Recommended School Crossing Treatments
Source: 2012 Ohio Manual of Uniform Traffic Control Devices, Figure 7B-4



Additionally, intersection lighting should be evaluated for proper illumination to ensure that the crosswalks are clearly visible in dark and/or foggy conditions.

While not required, the integration of rapid flashing beacons into the school crossing sign (see question #1), could be considered as an additional measure to highlight the school crossing. These rapid flashing beacons would provide additional warning to approaching drivers of the pedestrian in the cross walk, particularly on dark and/or foggy mornings. The flashing lights for this type of treatment are activated when pedestrians push a button before crossing the street.

5. **From our conversation today – and prior conversations that we have had – you expressed concern over the volume of traffic entering and exiting the Social Security Administration Office (SSAO) on 4th Street, whether the entrance/exit is adequate to safely accommodate this traffic, and what impact that potential increased traffic on 4th Street may have on your clients' ability to enter and exit your facility safely. You are particularly concerned about the one-way alley located on the east side of your building that exits on to 4th Street – and the fact that many visitors mistake this alley as an entrance to your agency, thereby entering against traffic.**

   You would be interested in data regarding:
   - **the volume of traffic that enters and exits your facility**
   - **the volume of traffic on 4th Street**
   - **the traffic flow on the one-way alley beside your facility**
   - **the impact that increased traffic on 4th Street would have on your business**
   - **the impact that "backed-up" traffic waiting to enter Gay Street from 4th Street would have on your entrance**

To address this question, traffic counts were performed at the entrance to the SSAO from Fourth Street and the one-way alley beside the SSAO, in April 2012. These volumes are illustrated in the diagrams in Appendix F. Using the same methodology used for the 2010 study, anticipated traffic volumes at this location after the closure of Third Street between Gay Street and Waller Street were estimated. The study assumes that all traffic currently using Third Street will shift to Fourth Street. Traffic operational analyses were performed using the estimated post-Third Street closure volumes on Fourth Street.

A fairly small number of vehicles enter and exit the SSAO parking lot even during the peak periods. Overall, entering and exiting the site should not be a problem after the conversion. However, there is one situation that is not ideal. The 2010 study recommended that a traffic signal be installed at the Fourth Street and Gay Street intersection as part of the closure of Third Street. Under the signalized condition, during a.m. and p.m. peak periods of traffic, the backup of westbound traffic on Fourth Street at Gay Street is anticipated to occasionally extend past the driveway to the parking lot for the SSAO, which is located only approximately 80 feet from the intersection. The analysis from the 2010 study (see page 9 of the 2010 study) estimated that the queue of westbound waiting vehicles could reach up to 6 cars or more at times (equating to approximately 150 feet of backup), which would block the driveway.

Given the small number of vehicles that enter and exit the SSAO during the a.m. and p.m. peak times to/from Fourth Street, it is not anticipated that this situation will cause a significant traffic problem. However, the following options could be implemented to mitigate the situation:

- Move the current driveway location to a minimum of 150’ from the Gay Street intersection
- Reverse the one-way directionality of the alley
- Make the alley two-way (the adequacy of the width should be explored for this option)

See Appendix F for the traffic volume data and analysis.

6. The issue of needed improvements on Fourth Street and Gallia Street if Third Street was closed, including the turning radius of the streets turning right on to Fourth Street.

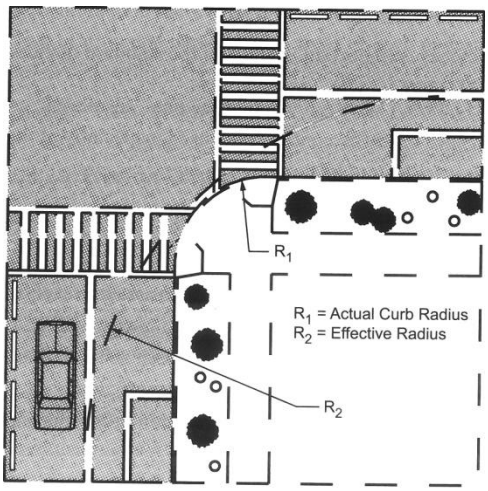
The 2010 study concluded that current Third Street traffic would move to the closest alternative route (Fourth Street) and would have no reason to move to Gallia Street, so this discussion is limited to impacts on Fourth Street.

The traffic counts performed revealed that the there is a very small number of trucks that currently use Third Street. Therefore the turning radii were evaluated considering that there is a need to handle only an occasional large truck (18-wheel semi-trailer), and that the majority of the trucks that will use Fourth Street will be smaller (UPS, Fed-Ex, other delivery type) trucks. The review focused on the only two right turn movements that are anticipated to experience a significant increase in right turning traffic after the conversion: 1) northbound right turn from Gay Street to Fourth Street, and 2) southbound right turn from Offner Street to Fourth Street.

Using templates that simulate the movements of a turning truck (see Appendix G), our analysis verified that it is possible for larger trucks to make these right turn movements, just as they would at most downtown intersections (by utilizing the adjacent lane to make their turn). Given the very small number of larger trucks that will use this route, this is appropriate design for large trucks at these intersections.

Our review also confirmed that smaller delivery trucks would be able to make these turns without encroaching into the adjacent lane. Given the generous width of the existing streets (travel lane plus parking lane) the “effective

turning radius" is much larger than the curb radius. The effective turning radius is the true turning radius for cars and trucks as can be seen below:



While not necessarily required, if desired, as much as physically feasible, the radius of the curb on these two corners could be increased to facilitate swifter movement of trucks. However, it should also be noted that the speed of all vehicles making the turn will increase and the distance of the crossing for pedestrians will also increase, which could have an adverse impact on pedestrian crossing safety. Therefore the maximum radius recommended is 15 feet.

7. The impact on the need for expanded signalization on Fourth Street and possibly Gallia Street.

The 2010 study explored the need for signalization on Fourth Street. Only the addition of a signal at the intersection of Fourth Street and Gay Street was recommended. The conclusion from the previous study was that the traffic would not shift to Gallia Street since there is adequate traffic capacity on Fourth Street to handle the diverted traffic from Third Street. There would be no reason for traffic to move to Gallia Street.

8. As an alternative to closing Third Street, examine the impact of making Third Street one-way to the west and Fourth Street one-way to the east.

Making Third Street and Fourth Street one-way would likely increase traffic speeds on both of these streets unless they were completely redesigned to be much narrower with traffic calming treatments. This suggested alternative would not address the needs of SSU to minimize pedestrian and vehicular conflicts in the Third Street corridor and therefore is not considered a viable option.

9. The impact of the closure of traffic on Third Street on the traffic on Gallia Street and Fourth Street.

This was precisely the scope of the 2010 study that was prepared for SSU and submitted to the City. The potential impacts to Fourth Street were clearly identified and the study concluded that there would be no impacts to Gallia Street.

10. Impact on the schools, Social Security office and Bureau of Workers Compensation Office (BWCO), if Third Street is closed.

Since no traffic is anticipated to shift to Gallia Street, there is no anticipated impact on the schools with respect to access to and from Gallia Street. The operations of the intersection of Fourth Street and Glover Street (which provides access to the elementary school from Fourth Street) was evaluated as part of question number two above (no operational problems were found). Student crossings on Fourth Street were addressed as part of question number four above. Impacts to the SSAO were addressed in question number five above.

To address potential impacts to the BWCO, traffic counts were performed at its entrance to Fourth Street, in April 2012. These volumes are illustrated in the diagrams in Appendix H. Using the same methodology used for the 2010 study, anticipated traffic volumes at this location after the closure of Third Street between Gay Street and Waller Street were estimated. The study assumes that all traffic that currently uses Third Street will shift to Fourth Street. Traffic operational analyses were performed using the estimated post-Third Street closure volumes on Fourth Street.

The counts indicate that only a very small number of vehicles enter and exit the BWCO parking lot even during the peak periods. Even though the volume of traffic passing the driveway to the BWCO will be greater after the conversion, the analysis showed that entering and exiting the BWCO site will not be a problem after the conversion.

11. The cost of improvements to Fourth Street and Gallia Streets---sidewalk repair, curbs, burying utilities underground, signalization and crosswalks.

Based on the anticipated impacts due to the additional traffic on Fourth Street after the closure of Third Street, as were identified in the 2010 study, and this memorandum, the following potential improvements (with preliminary estimated costs) were identified:

Recommended

- Install traffic signal at Fourth Street and Gay Street - The estimated cost assumes that the signal poles, controller, heads, etc. can be relocated from the existing entrance to SSU from Third Street ($50,000).
- Place pavement markings through the Waller Street and Fourth Street intersection (north-south) to help guide traffic through the “offset” intersection ($1,000).
- Move the existing Fourth Street driveway for the Social Security Administration Office from its current location to at least 150 feet east of the westbound stop line at Gay Street ($6,000).
- Upgrade traffic signal at Waller Street to include pedestrian signal heads and vehicular detection and an upgraded controller to improve pedestrian friendliness and to improve traffic operations ($90,000).
- Improve the visibility of the existing school crossings across Fourth Street at Union Street and Glover Street through improved signing, pavement markings, and lighting ($50,000).

Optional

- Increase the corner radius for right turns for northbound right turns from Gay Street onto Fourth Street, and southbound right turns from Offner Street to Fourth Street. To maintain pedestrian crossing safety, limit the increase in the corner radius to 15 feet ($30,000).
- If Third Street is not closed between Gay Street and Waller Street as proposed, then implement the lane reduction concept and crosswalk improvements at the VRCFA on the roadway that connects northbound Chillicothe Street to Third Street ($20,000).

Details of the above cost estimates are included in Appendix I.

The cost for sidewalk repair, curbs, and burying utilities along 4th Street, beyond what would be included for the above items, has not been included herein because the need for those items would not be caused by the closing of Third Street.

12. The impact of excessive speed on the traffic on Third Street from those coming across the bridge over the Ohio River.

The current design of the roadway that connects northbound traffic from Chillicothe Street to eastbound Third Street encourages vehicles to accelerate as they approach the campus are of SSU. Obviously the most effective option to eliminate the problem of high-speed traffic would be to close Third Street as has been proposed. However, if the closure is not completed in a timely manner, there are other potential options to slow traffic that could be explored.

One alternative option would be to implement the lane reduction on the connecting roadway as described in question number one in this memorandum. Another option would be to be to remove or close the connecting roadway and require that traffic using Third Street continue north and turn right onto Third Street directly from Chillicothe Street at the existing intersection.

Appendix A

Volume Comparison of 2010 Estimates

To 2012 Counts

COMPARISON OF 2010 ESTIMATES TO 2012 COUNTS OF FULL-SESSION TRAFFIC VOLUMES

	AM Peak Hour			PM Peak Hour		
	2012 Count with SSU in Session	2010 Study Estimate	Difference	2012 Count with SSU in Session	2010 Study Estimate	Difference
SSU Entrance @ 3rd Street						
Westbound Thru	263	256	-7	126	132	6
Westbound Left	47	30	-17	8	18	10
Eastbound Thru	219	286	67	215	189	-26
Eastbound Right	13	57	44	64	195	131
Northbound Left	92	84	-8	6	33	27
Northbound Right	9	12	3	2	12	10
Intersection Total	643	725	82	421	579	158
Waller @ 3rd Street						
Westbound Left	32	15	-17	57	105	48
Westbound Thru	166	172	6	111	113	2
Westbound Right	11	7	-4	14	13	-1
Eastbound Left	50	38	-12	71	53	-18
Eastbound Thru	225	212	-13	118	133	15
Eastbound Right	25	42	17	12	21	9
Northbound Left	29	78	49	6	6	0
Northbound Thru	69	120	51	14	8	-6
Northbound Right	26	40	14	3	3	0
Southbound Left	14	9	-5	6	3	-3
Southbound Thru	51	57	6	62	144	82
Southbound Right	40	40	0	28	30	2
Intersection Total	738	830	92	502	632	130

Legend:

2010 Study Under-estimated Traffic Volumes

2010 Study Under-estimated Traffic Volumes

Appendix B

HCS Analysis for Question #1

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*SLT*
Agency/Co.	
Date Performed	*8/29/2012*
Analysis Time Period	*PM peak hour*

Site Information

Intersection	*3rd and Gay Street*
Jurisdiction	
Analysis Year	*After Conversion*

Project Description *Addendum to 2010 Traffic Study for Closure of 3rd Street*

East/West Street: *Third Street* | North/South Street: *Gay Street*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*232*	*260*	*3*	*3*	*307*	*50*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*257*	*288*	*3*	*3*	*341*	*55*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*1*
Configuration	*LTR*			*LT*		*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*6*	*4*	*8*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*6*	*4*	*8*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LT*		*LTR*				
v (veh/h)	*257*	*3*		*18*				
C (m) (veh/h)	*1174*	*1282*		*236*				
v/c	*0.22*	*0.00*		*0.08*				
95% queue length	*0.83*	*0.01*		*0.25*				
Control Delay (s/veh)	*8.9*	*7.8*		*21.5*				
LOS	*A*	*A*		*C*				
Approach Delay (s/veh)	--	--	*21.5*					
Approach LOS	--	--	*C*					

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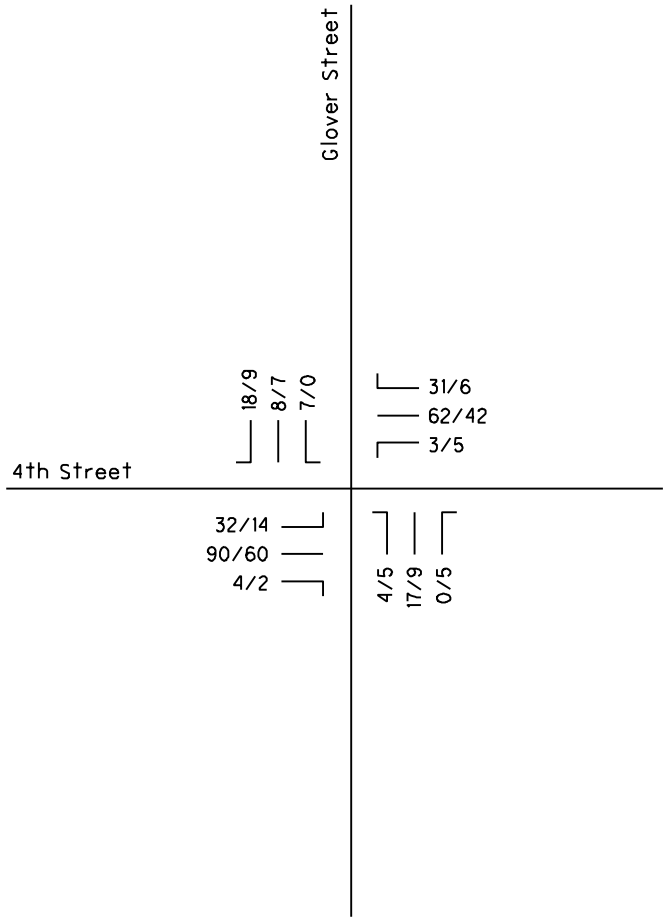
Appendix C

4th Street at Glover Street

Volume and Synchro Data

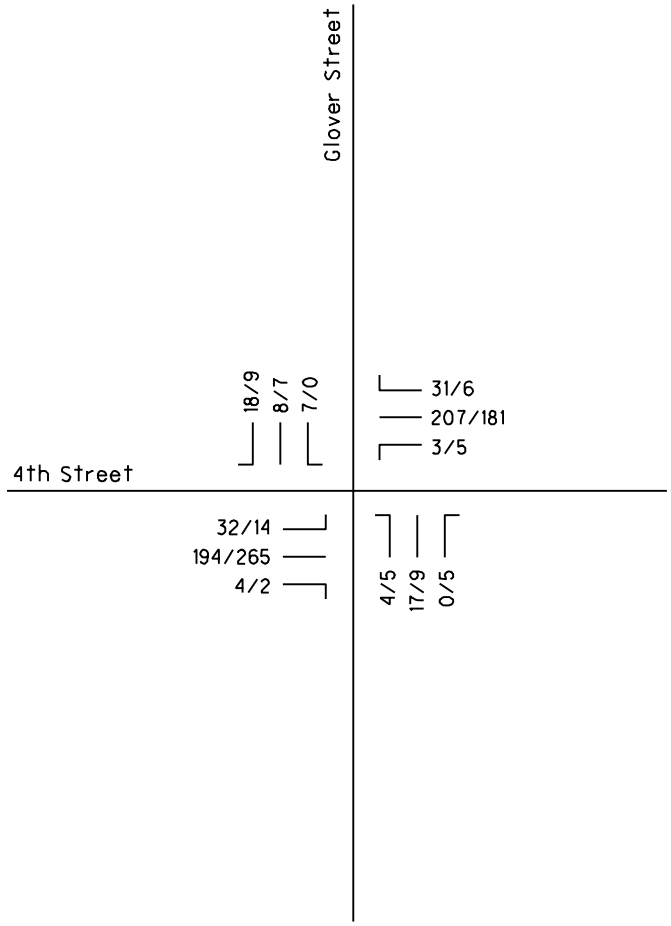
(for Question #2)



NOT TO SCALE

SHAWNEE STATE UNIVERSITY
AM/PM
APRIL 2012

BURGESS & NIPLE



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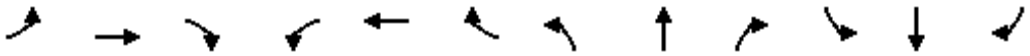
SHAWNEE STATE UNIVERSITY
ESTIMATED VOLUMES AFTER 3RD ST. CLOSURE
AM/PM APRIL 2012

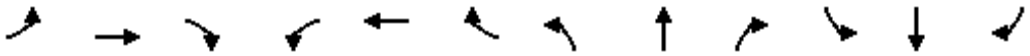
BURGESS & NIPLE



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	32	194	4	3	207	31	4	17	0	7	8	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	211	4	3	225	34	4	18	0	8	9	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		697			359							
pX, platoon unblocked												
vC, conflicting volume	259			215			555	548	213	540	533	242
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	259			215			555	548	213	540	533	242
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			99	96	100	98	98	98
cM capacity (veh/h)	1306			1355			416	431	827	428	440	797

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	250	262	23	36
Volume Left	35	3	4	8
Volume Right	4	34	0	20
cSH	1306	1355	428	578
Volume to Capacity	0.03	0.00	0.05	0.06
Queue Length 95th (ft)	2	0	4	5
Control Delay (s)	1.3	0.1	13.9	11.6
Lane LOS	A	A	B	B
Approach Delay (s)	1.3	0.1	13.9	11.6
Approach LOS			B	B

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	14	265	2	5	181	6	5	9	5	0	7	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	288	2	5	197	7	5	10	5	0	8	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		767			289							
pX, platoon unblocked												
vC, conflicting volume	203			290			544	534	289	541	532	200
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	203			290			544	534	289	541	532	200
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	98	99	100	98	99
cM capacity (veh/h)	1368			1272			434	445	750	436	447	841

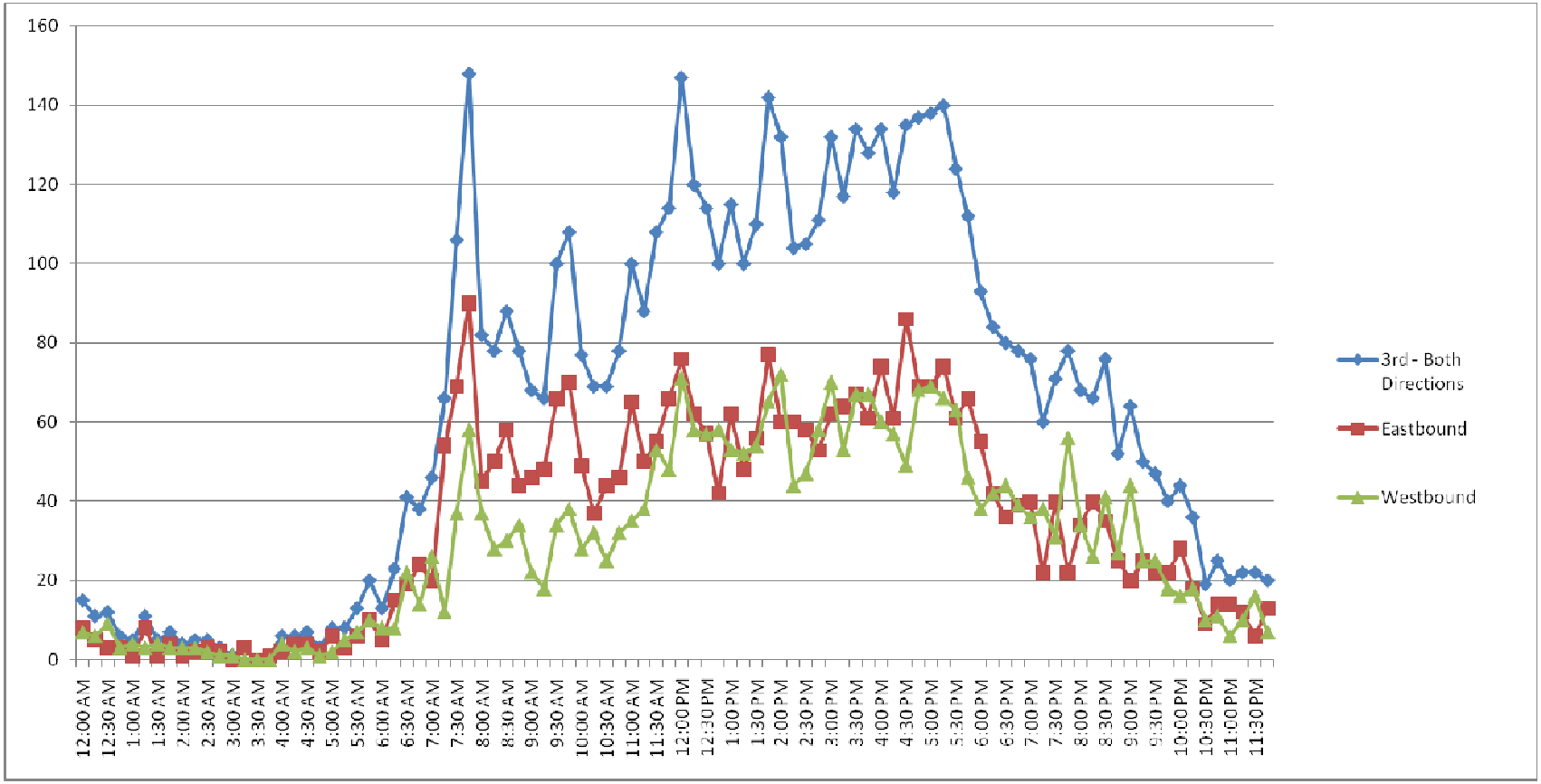
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	305	209	21	17
Volume Left	15	5	5	0
Volume Right	2	7	5	10
cSH	1368	1272	495	607
Volume to Capacity	0.01	0.00	0.04	0.03
Queue Length 95th (ft)	1	0	3	2
Control Delay (s)	0.5	0.2	12.6	11.1
Lane LOS	A	A	B	B
Approach Delay (s)	0.5	0.2	12.6	11.1
Approach LOS			B	B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix D

2010 Count Graph

(for Question #3)

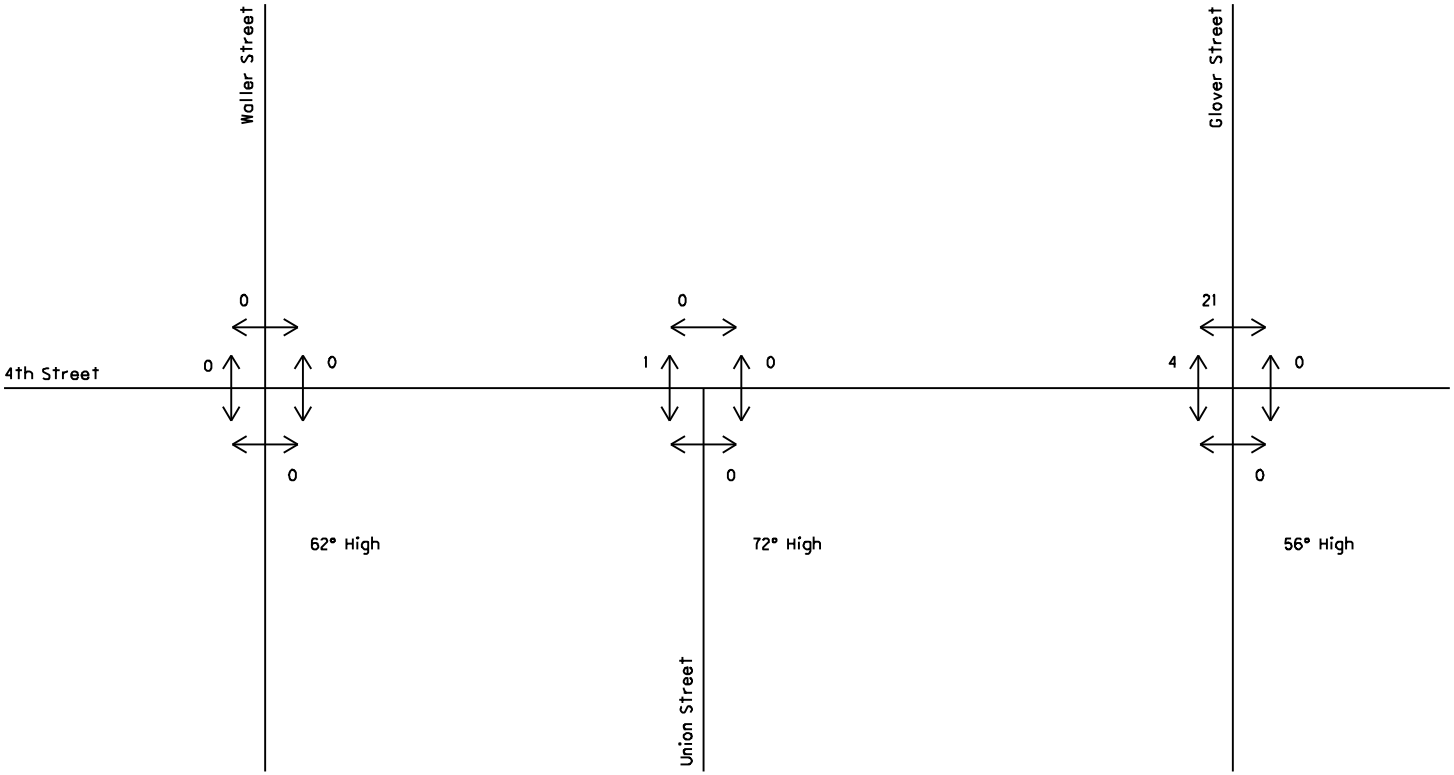

160
140
120
100
80
60
40
20
0
12:00 AM
12:30 AM
1:00 AM
1:30 AM
2:00 AM
2:30 AM
3:00 AM
3:30 AM
4:00 AM
4:30 AM
5:00 AM
5:30 AM
6:00 AM
6:30 AM
7:00 AM
7:30 AM
8:00 AM
8:30 AM
9:00 AM
9:30 AM
10:00 AM
10:30 AM
11:00 AM
11:30 AM
12:00 PM
12:30 PM
1:00 PM
1:30 PM
2:00 PM
2:30 PM
3:00 PM
3:30 PM
4:00 PM
4:30 PM
5:00 PM
5:30 PM
6:00 PM
6:30 PM
7:00 PM
7:30 PM
8:00 PM
8:30 PM
9:00 PM
9:30 PM
10:00 PM
10:30 PM
11:00 PM
11:30 PM
3rd - Both Directions
Eastbound
Westbound

Appendix E

Pedestrian Volumes

Along 4th Street

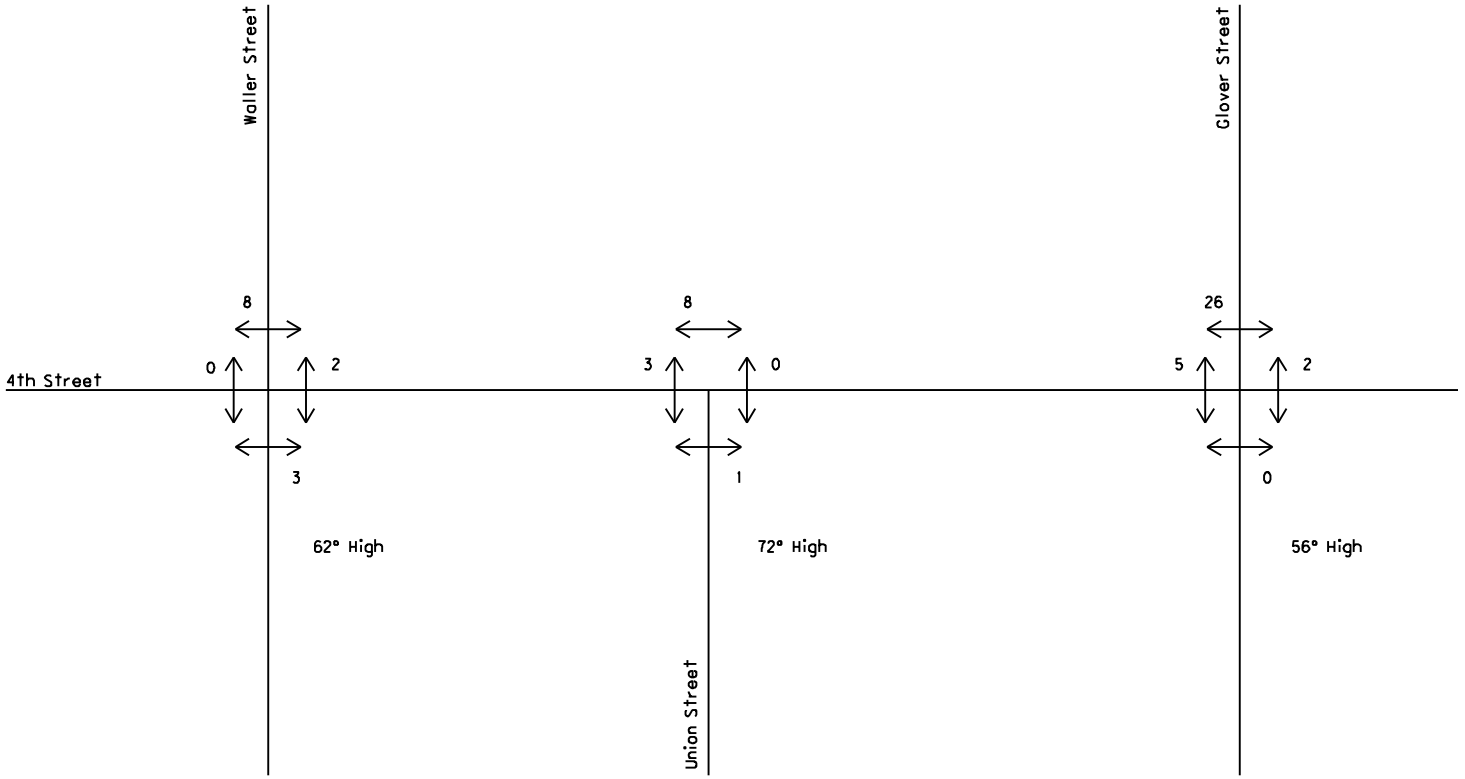
(for Question #4)



NOT TO SCALE

SHAWNEE STATE UNIVERSITY
PEDESTRIAN COUNTS
AM PEAK : 7:15 - 9:00AM
APRIL 2012

BURGESS & NIPLE



NOT TO SCALE

SHAWNEE STATE UNIVERSITY
PEDESTRIAN COUNTS
PM PEAK : 2:15 - 3:30PM
APRIL 2012

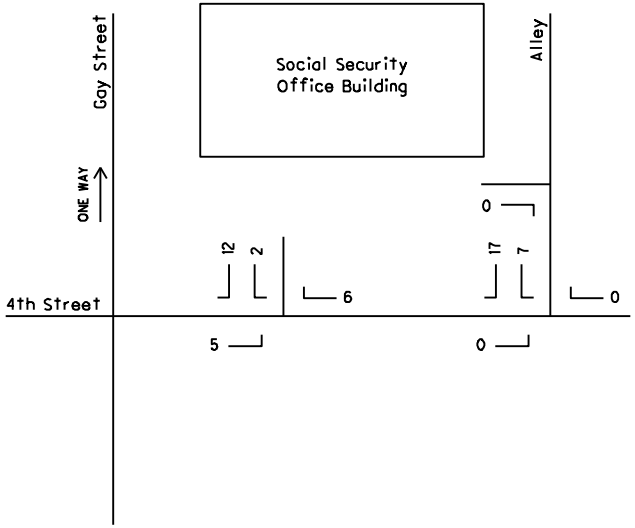
BURGESS & NIPLE

Appendix F

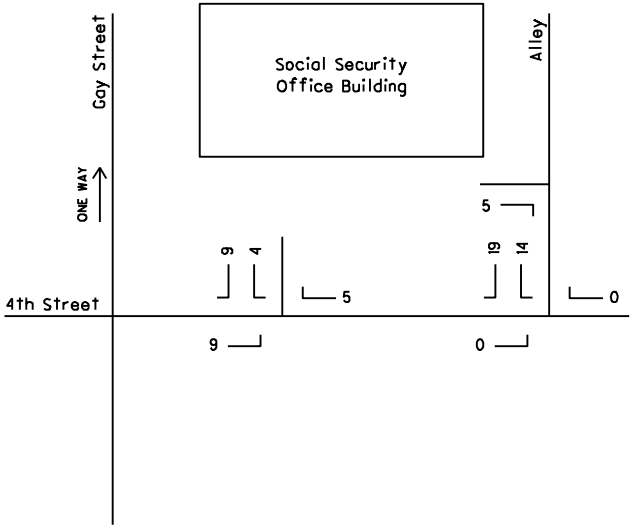
Social Security Administration Office

Count and Synchro Data

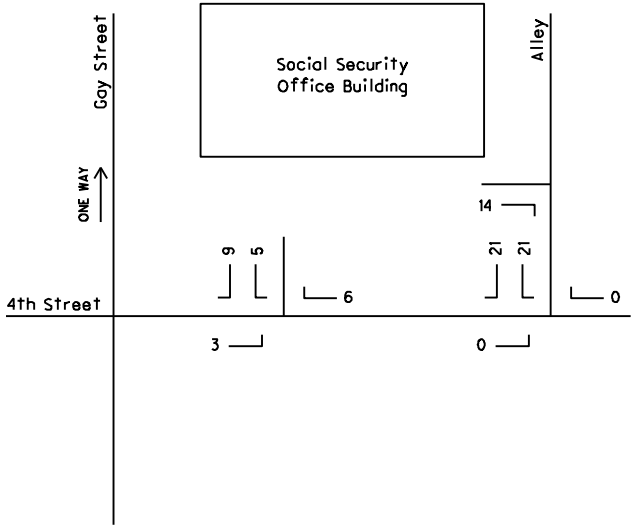
(for Question #5)



AM PEAK : 9:00 - 10:00AM



MIDDAY PEAK : 11:45AM - 12:45PM

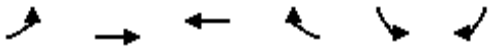


PM PEAK : 2:45 - 3:45PM

NOT TO SCALE

SHAWNEE STATE UNIVERSITY
APRIL 2012

BURGESS & NIPLE



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	428	307	6	2	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	465	334	7	2	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	340				813	337
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	340				813	337
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	98
cM capacity (veh/h)	1219				346	705

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	471	340	15
Volume Left	5	0	2
Volume Right	0	7	13
cSH	1219	1700	614
Volume to Capacity	0.00	0.20	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.1	0.0	11.0
Lane LOS	A		B
Approach Delay (s)	0.1	0.0	11.0
Approach LOS			B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	36.5%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix G

Truck Turning Movements

Onto 4th Street

(for Question #6)

4th Street
Gay Street


4th Street
Offner Street

4th Street
Gay Street

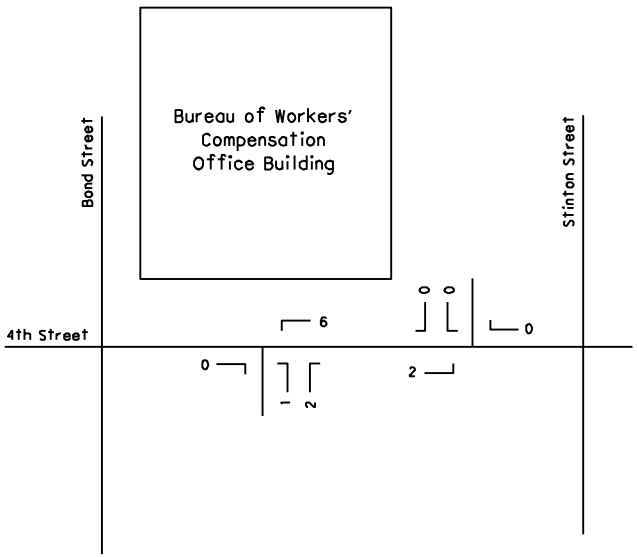

4th Street
Offner Street

Appendix H

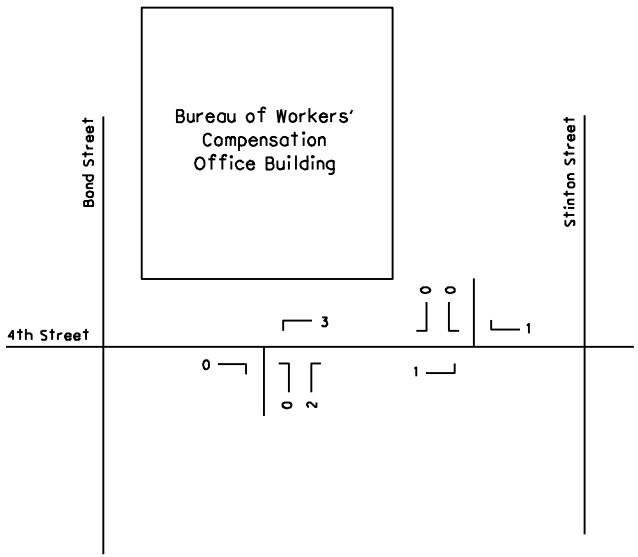
Bureau of Workers' Compensation Office

Count and Synchro Data

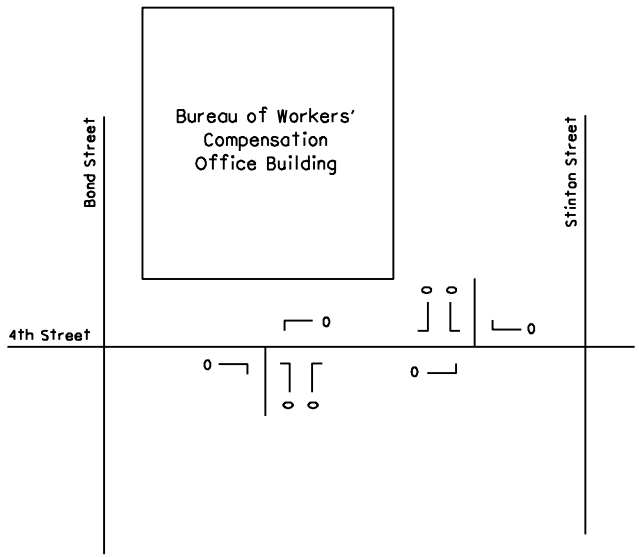
(for Question #10)



AM PEAK : 9:00 - 10:00AM



MIDDAY PEAK : 11:45AM - 12:45PM



PM PEAK : 2:45 - 3:45PM

NOT TO SCALE

SHAWNEE STATE UNIVERSITY
APRIL 2012

BURGESS & NIPLE

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	473	0	6	284	1	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	514	0	7	309	1	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			514		836	514
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			514		836	514
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1051		335	560

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	514	315	3
Volume Left	0	7	1
Volume Right	0	0	2
cSH	1700	1051	458
Volume to Capacity	0.30	0.01	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.2	12.9
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	12.9
Approach LOS			B

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		34.9%	ICU Level of Service A
Analysis Period (min)		15	

Appendix I

Cost Estimates for Improvements

(for Question #11)

Cost Estimates for 4th Street Recommended Improvement Options

Improvement	Associated Items of Work	Quantity	Unit	Unit Cost	Total Cost	
1 Install Signal at 4th and Gay						
	Reuse of Mast Arms	2	EACH	$3,000.00	$6,000	
	Mast Arm Foundation	2	EACH	$2,550.00	$5,100	
	Reuse of Vehicular Signal Heads	6	EACH	$200.00	$1,200	
	Reuse of Controller	1	EACH	$3,750.00	$3,750	
	Cabinet Foundation	1	EACH	$1,300.00	$1,300	
	Controller Work Pad	1	EACH	$250.00	$250	
	5/C Cable	930	FEET	$1.65	$1,535	
	Ground Rod	3	EACH	$150.00	$450	
	Pedestal, 11'	2	EACH	$480.00	$960	
	Pedestal Foundation	2	EACH	$680.00	$1,360	
	Power Service	1	EACH	$2,050.00	$2,050	
	Power Cable	100	FEET	$3.00	$300	
	Pedestrian Pushbuttons	8	EACH	$180.00	$1,440	
	Pedestrian Signal Heads (LED)	8	EACH	$450.00	$3,600	
	Detector Loops	4	EACH	$950.00	$3,800	
	Loop Detector Lead-In Cable	500	FEET	$1.50	$750	
	Pull Box	4	EACH	$600.00	$2,400	
	2" Conduit	80	FEET	$2.90	$232	
	Trench	80	FEET	$5.20	$416	
	Loop Detector Unit	2	EACH	$200.00	$400	
	Removal of Traffic Signal Installation	1	EACH	$2,000.00	$2,000	
	Stop Sign	1	EACH	$208.20	$208	
	Removal of Stop Signs	2	EACH	$24.50	$49	
	Subtotal				$39,550	
	Contingency			25%	$9,887	
			Total Cost for this Improvement =		**$49,437**	**say $50,000**
2 PMs for Waller Offset						
	Dotted Line, 4"	126	FEET	$2.00	$252	
	Subtotal				$252	
	Contingency			25%	$63	
			Total Cost for this Improvement =		**$315**	**say $1,000**
3 Move SSAO Driveway						
	Walk Removed	600	SQ FT	$1.46	$876	
	4" Concrete Walk	300	SQ FT	$3.76	$1,128	
	Curb Type 6	50	FEET	$13.14	$657	
	Curb Removed	25	FEET	$3.71	$93	
	8' Non-Reinforced Concrete Pavement	33.33	SQ YD	$43.15	$1,438	
	Parking Lot Stall Marking	100	FEET	$0.67	$67	
	Concrete Parking Block	5	EACH	$108.75	$544	
	Subtotal				$4,803	
	Contingency			25%	$1,201	
			Total Cost for this Improvement =		**$6,003**	**say $6,000**

Improvement	Associated Items of Work	Quantity	Unit	Unit Cost	Total Cost	
4 4th at Waller Signal Upgrades						
	12" LED Signal Heads w/ Backplates	8	EACH	$790.00	$6,320	
	New Span Mounted Signs	16	SQ FT	$12.40	$198	
	Pedestrian Pushbuttons	8	EACH	$180.00	$1,440	
	Pedestrian Signal Heads (LED)	8	EACH	$450.00	$3,600	
	Detector Loops	4	EACH	$950.00	$3,800	
	Loop Detector Lead-In Cable	500	FEET	$1.50	$750	
	Pull Box	5	EACH	$600.00	$3,000	
	2" Conduit	100	FEET	$2.90	$290	
	Trench	100	FEET	$5.20	$520	
	Conduit Riser	4	EACH	$320.00	$1,280	
	5/C Cable	930	FEET	$1.65	$1,535	
	Strain Pole	4	EACH	$5,000.00	$20,000	
	Strain Pole Foundation	4	EACH	$2,600.00	$10,400	
	Messenger Wire	200	FEET	$7.00	$1,400	
	Loop Detector Unit	2	EACH	$200.00	$400	
	Controller Removed	1	EACH	$2,000.00	$2,000	
	Ground Mount Controller	1	EACH	$12,000.00	$12,000	
	Cabinet Foundation	1	EACH	$1,300.00	$1,300	
	Controller Work Pad	1	EACH	$250.00	$250	
	Subtotal				$70,483	
	Contingency			25%	$17,621	
			Total Cost for this Improvement =		**$88,104**	**say $90,000**
5 Improve School Crossings (Union and Glover with 4th)						
	Crosswalk Lines with Piano Keys	828	FEET	$3.00	$2,484	
	Sign, Flat Sheet	132	SQ. FT.	$12.30	$1,624	
	Sign Post, No. 2	162	FEET	$7.50	$1,215	
	Street Lighting Estimate (ODOT)	800	FEET	$40.00	$32,000	
	Subtotal				$37,323	
	Contingency			25%	$9,331	
			Total Cost for this Improvement =		**$46,653**	**say $50,000**
6 Increase Corner Raduis						
	Walk Removed	810	SQ FT	$1.46	$1,182.60	
	Curb Removed	90	FEET	$3.71	$333.45	
	4" Asphalt Conc. Base	5.54	CU YD	$117.91	$653.22	
	6" aggregate Base	8.30	CU YD	$37.47	$311.00	
	1.25" Asphalt Conc. Surf. Course	1.72	CU YD	$129.48	$222.71	
	1.75" Asphalt Conc. Int. Course	2.42	CU YD	$107.96	$261.26	
	4" Concrete walk	810	SQ FT	$3.76	$3,045.60	
	Curb Ramp	4	EACH	$437.50	$1,750.00	
	Curb Type 6	90	FEET	$13.14	$1,182.60	
	Catch Basin Reconstructed to grade	1	EACH	$785.67	$785.67	
	Fire Hydrant, Relocated	1	EACH	$1,468.75	$1,468.75	
	Street Lighting Relocation	232	FEET	$40.00	$9,280.00	
	Subtotal				$20,477	
	Contingency			25%	$5,119	
			Total Cost for this Improvement =		**$25,596**	**say $30,000**

Improvement	Associated Items of Work		Quantity	Unit	Unit Cost	Total Cost	
7 VRCFA Improvements							
	Edge Line		834	FEET	$0.43	$355	
	Transverse Lines		112	FEET	$4.82	$540	
	Crosswalk Lines with Piano Keys		187	FEET	$3.00	$561	
	Pavement Markings Removed		255	FEET	$3.50	$893	
	Sign, Flat Sheet		46.5	SQ. FT.	$12.30	$572	
	Sign Post, No. 2		146	FEET	$7.50	$1,095	
	Rapid Flashing Beacons Assembly		2	EACH	$6,000.00	$12,000	
		Subtotal				$16,016	
	Contingency				25%	$4,004	
				Total Cost for this Improvement =		**$20,020**	**say $20,000**

Appendix J

Traffic and Pedestrian Counts

Raw Data

(1)

Manual Intersection Counts

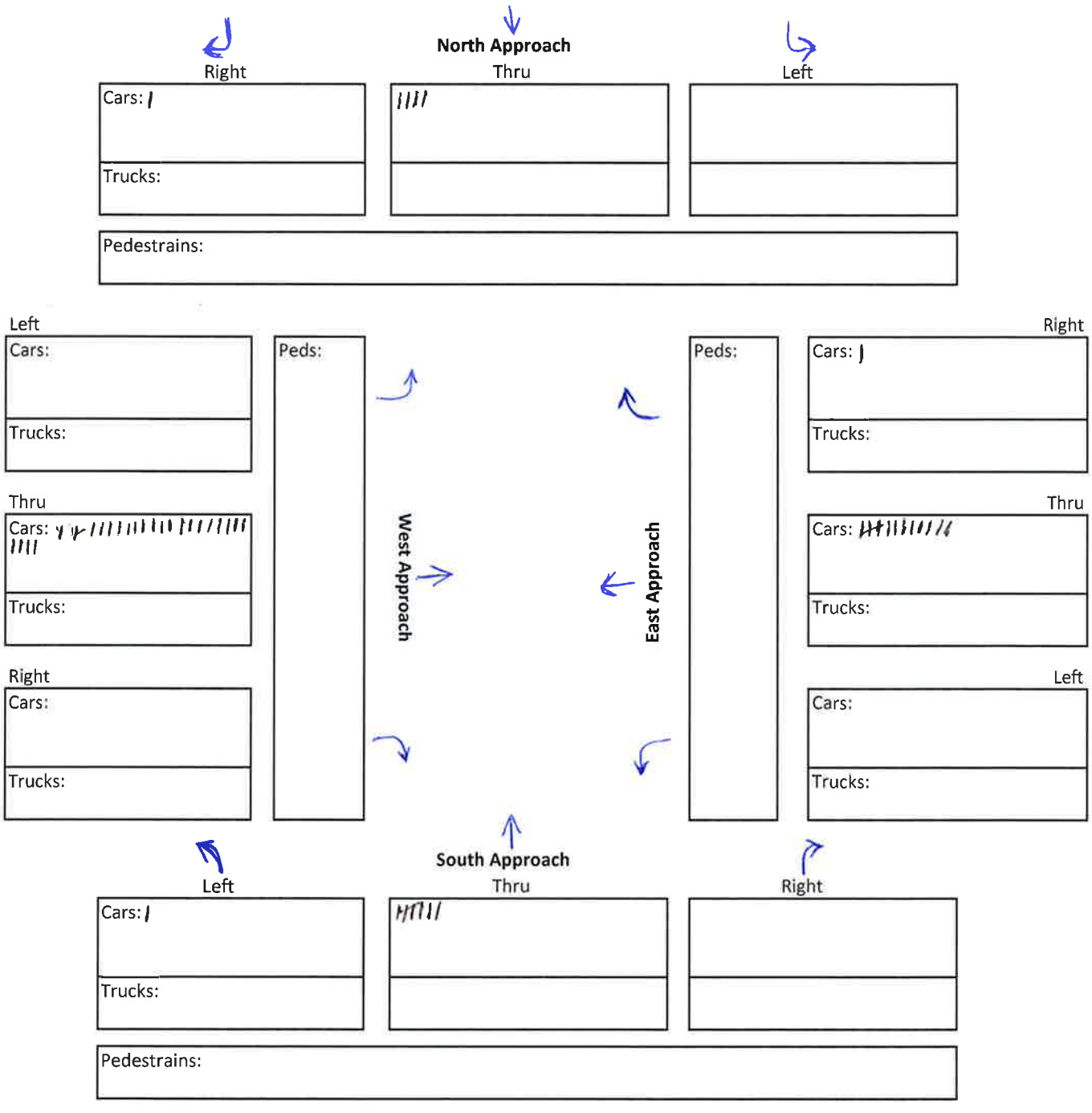
Intersection: 4th and Glover

Date: 4-18-12

Name: Brian Yerardi

Begin Time: 7:30 AM End Time: 7:45 AM

***Start a new sheet every 15 minutes.



(2)

Manual Intersection Counts

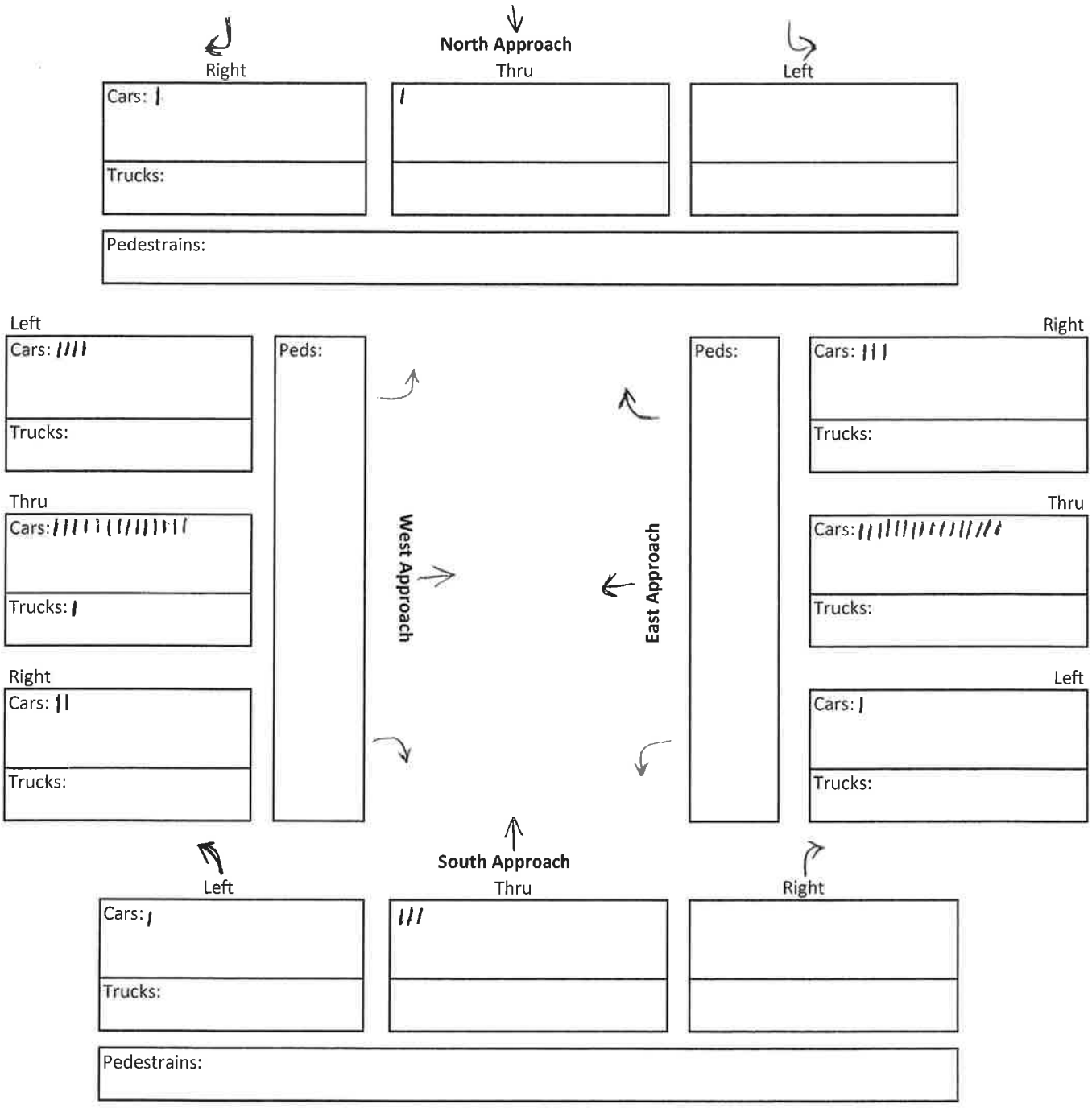
Intersection: 4th and Glover

Date: 4-18-12

Name: Brian Yerardi

Begin Time: 7:45 AM End Time: 8:00 AM

***Start a new sheet every 15 minutes.



(3)

Manual Intersection Counts

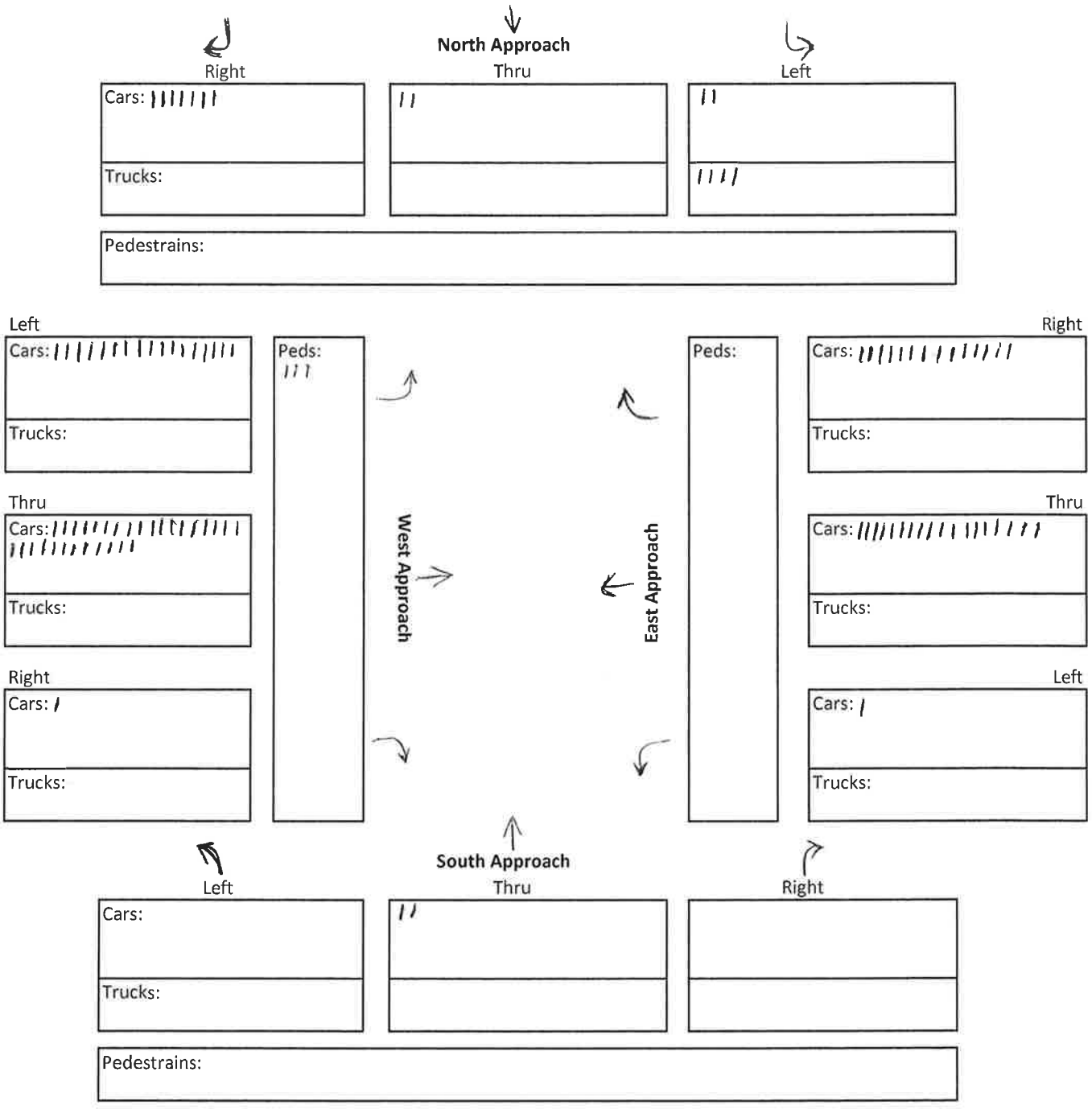
Intersection: 4th and Glover

Date: 4-18-12

Name: Brian Yerardi

Begin Time: 8:00 Am End Time: 8:15 Am

***Start a new sheet every 15 minutes.



(4)

Manual Intersection Counts

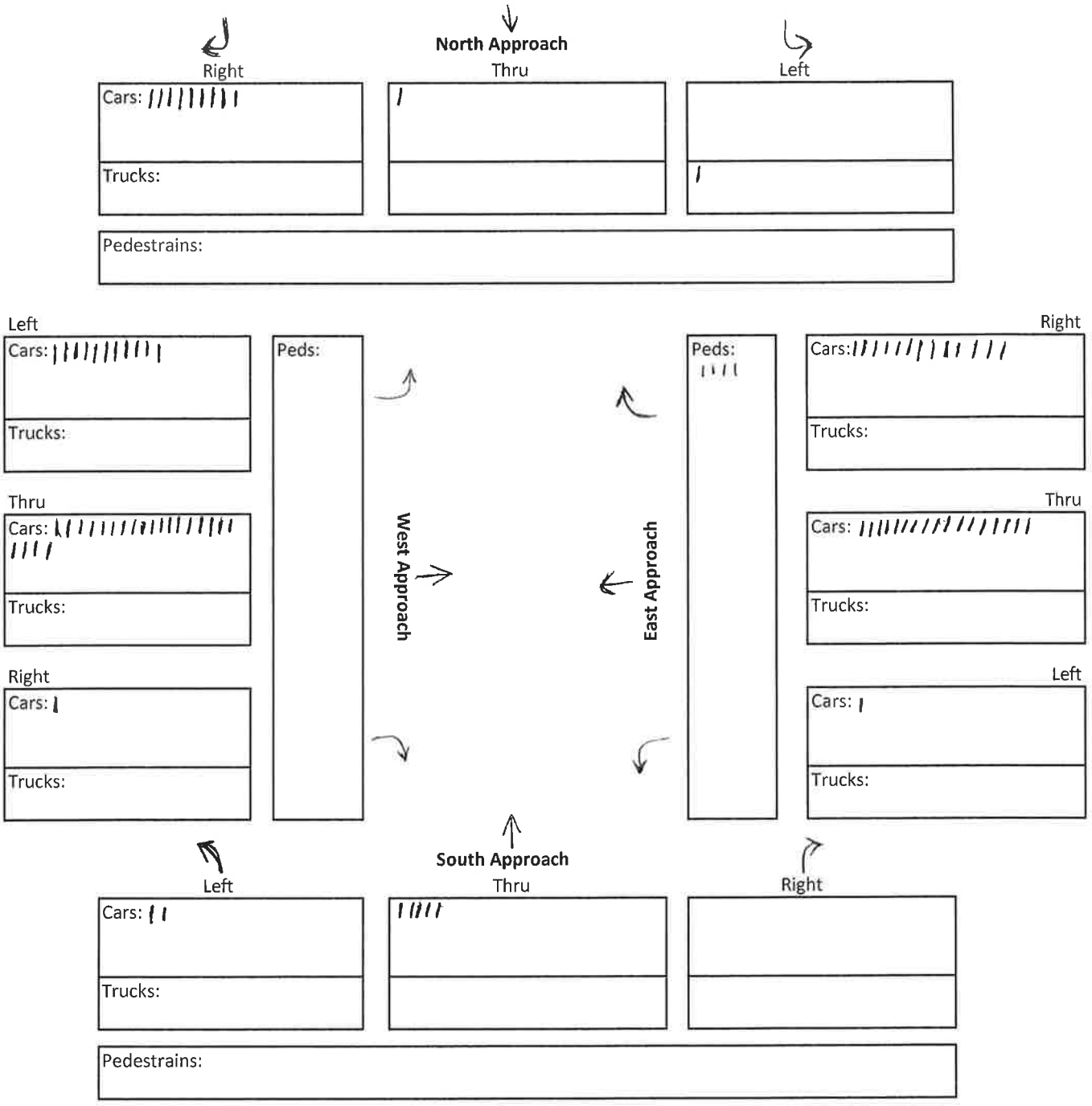
Intersection: 4th and Glover

Date: 4-18-12

Name: Brian Yerardi

Begin Time: 8:15 Am End Time: 8:30

***Start a new sheet every 15 minutes.



Manual Intersection Counts

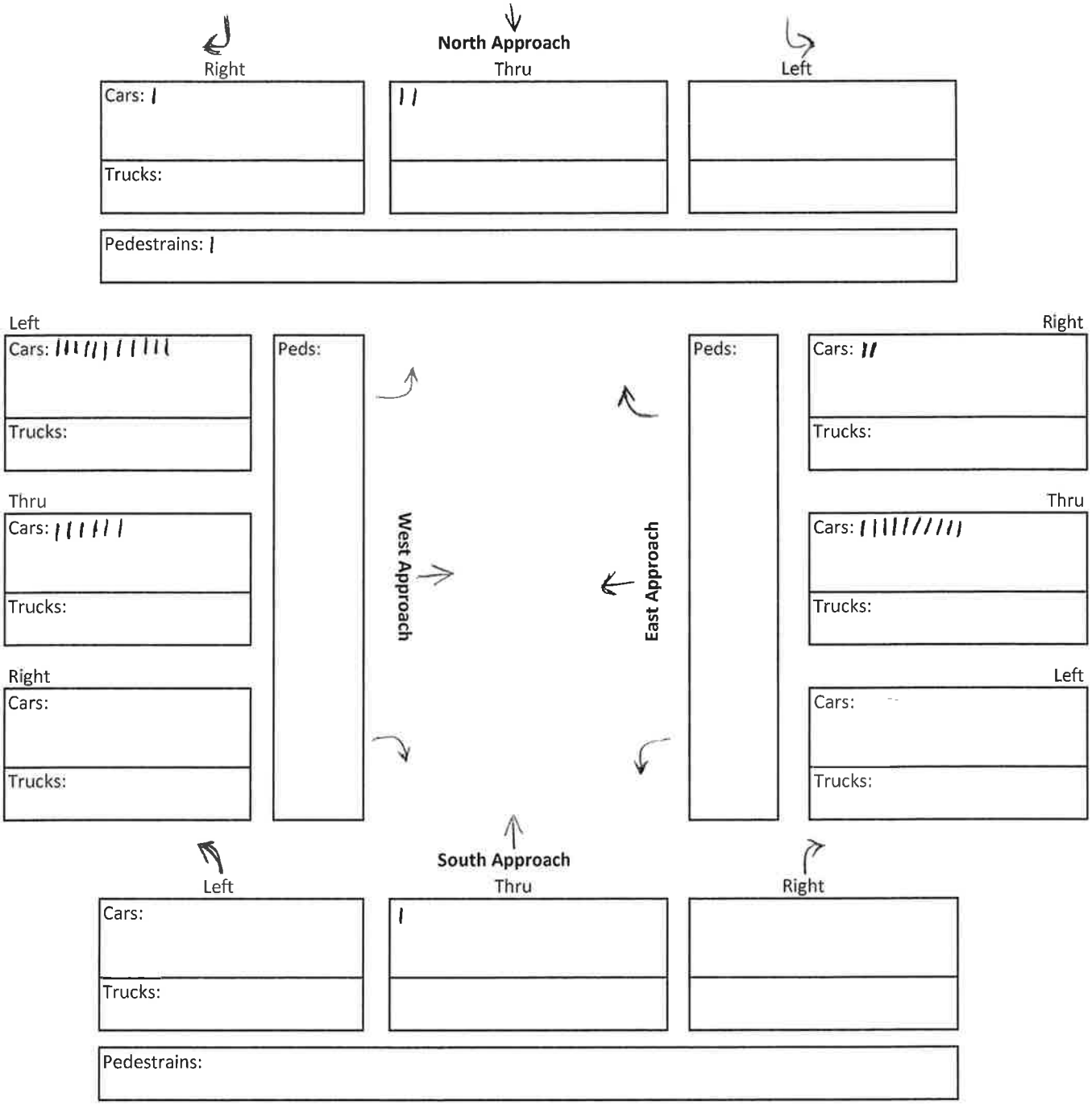
Intersection: 4th and Glover

Date: 4-18-12

Name: Brian Yecardi

Begin Time: 4:30 pm End Time: 4:45 pm

***Start a new sheet every 15 minutes.



Manual Intersection Counts

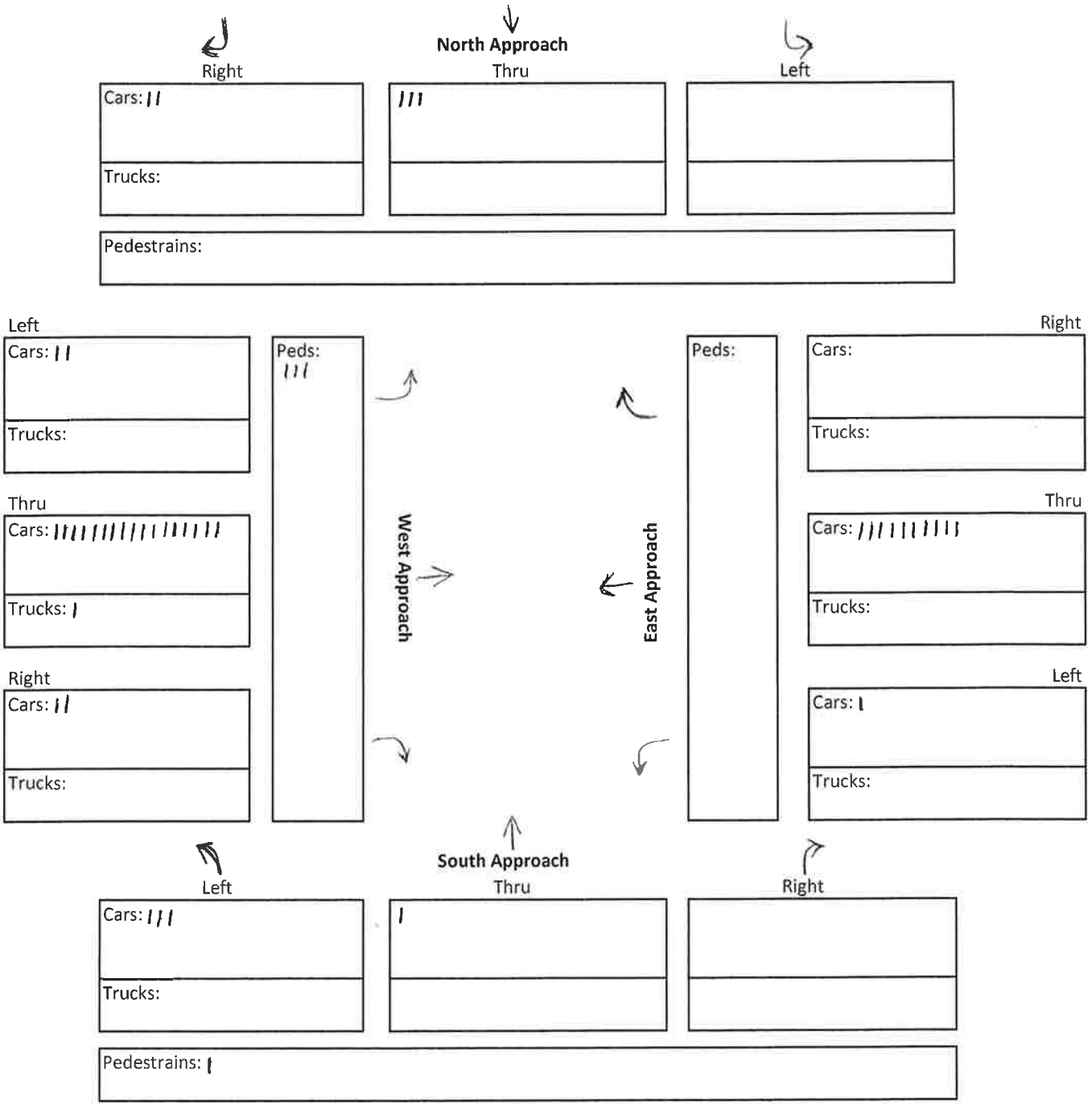
Intersection: 4th and Glover

Date: 4-18-12

Name: Brian Yerardi

Begin Time: 4:45 Pm End Time: 5:00 Pm

***Start a new sheet every 15 minutes.



Manual Intersection Counts

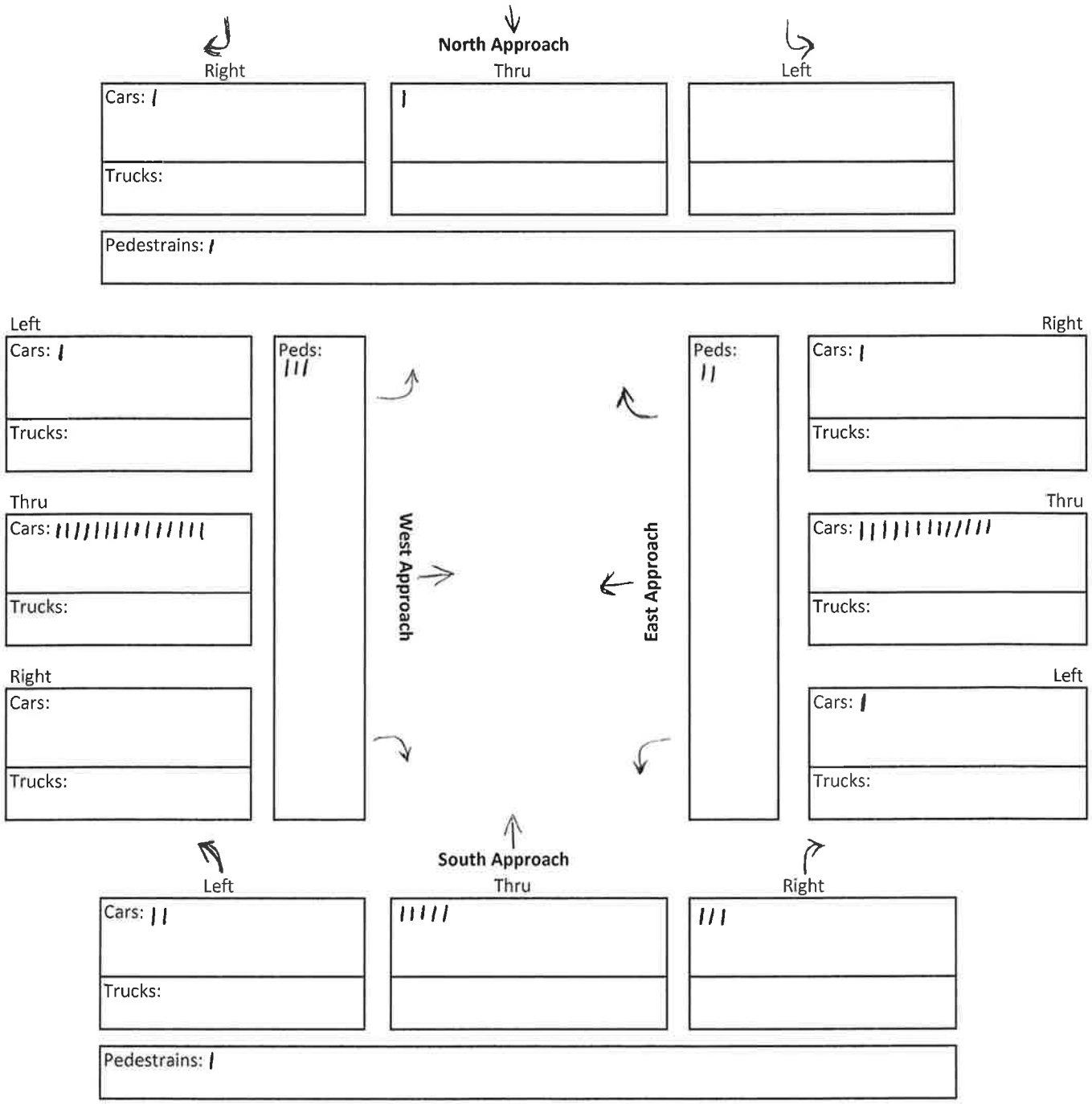
Intersection: 4th and Glover

Date: 4.18.12

Name: Brian Yerardi

Begin Time: 5:00 pm End Time: 5:15 pm

***Start a new sheet every 15 minutes.



(8)

Manual Intersection Counts

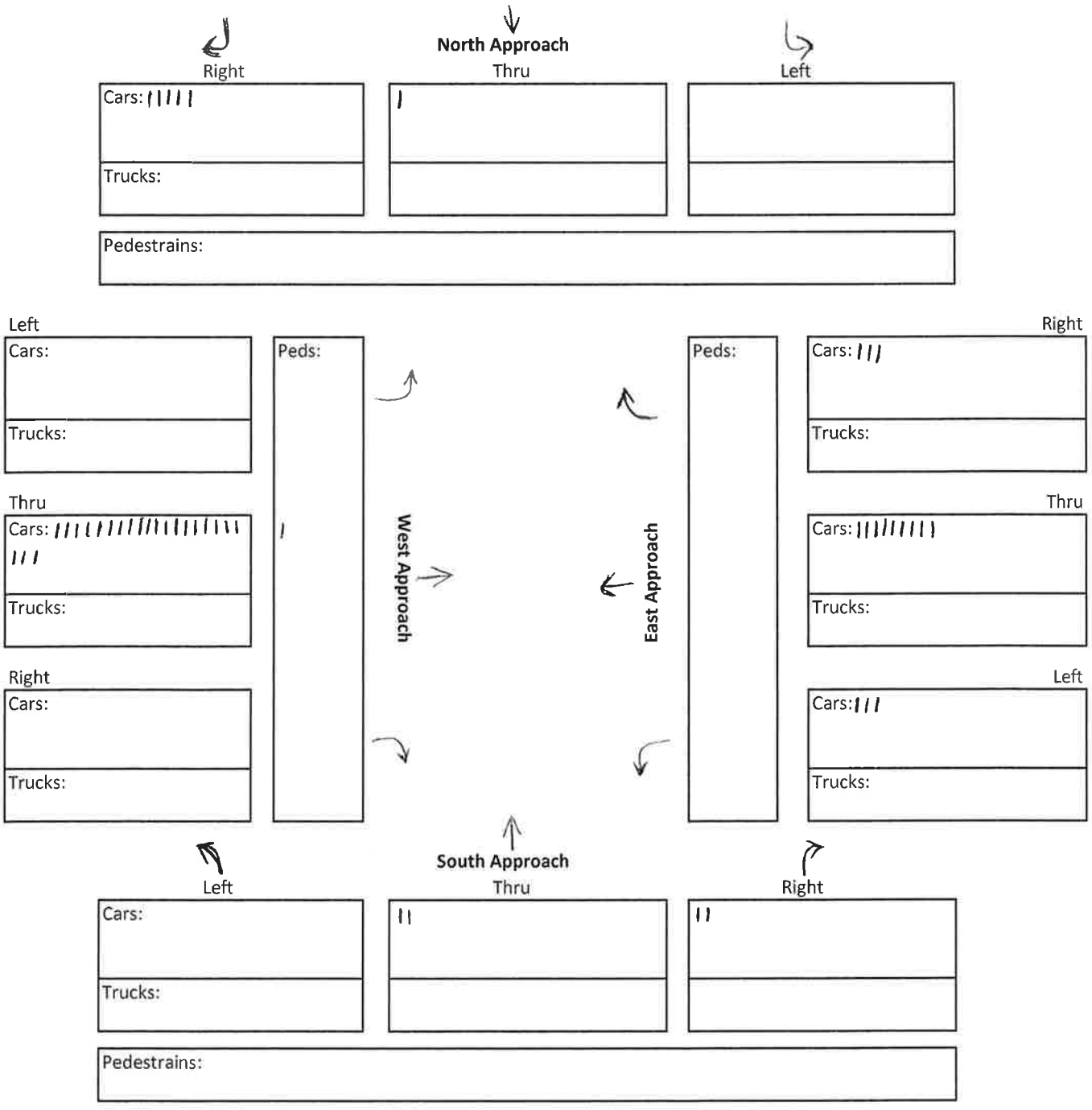
Intersection: 4th and Glover

Date: 4-18-12

Name: Brian Yeracdi

Begin Time: 5:15 pm End Time: 5:30 pm

***Start a new sheet every 15 minutes.



(1)

Manual Intersection Counts

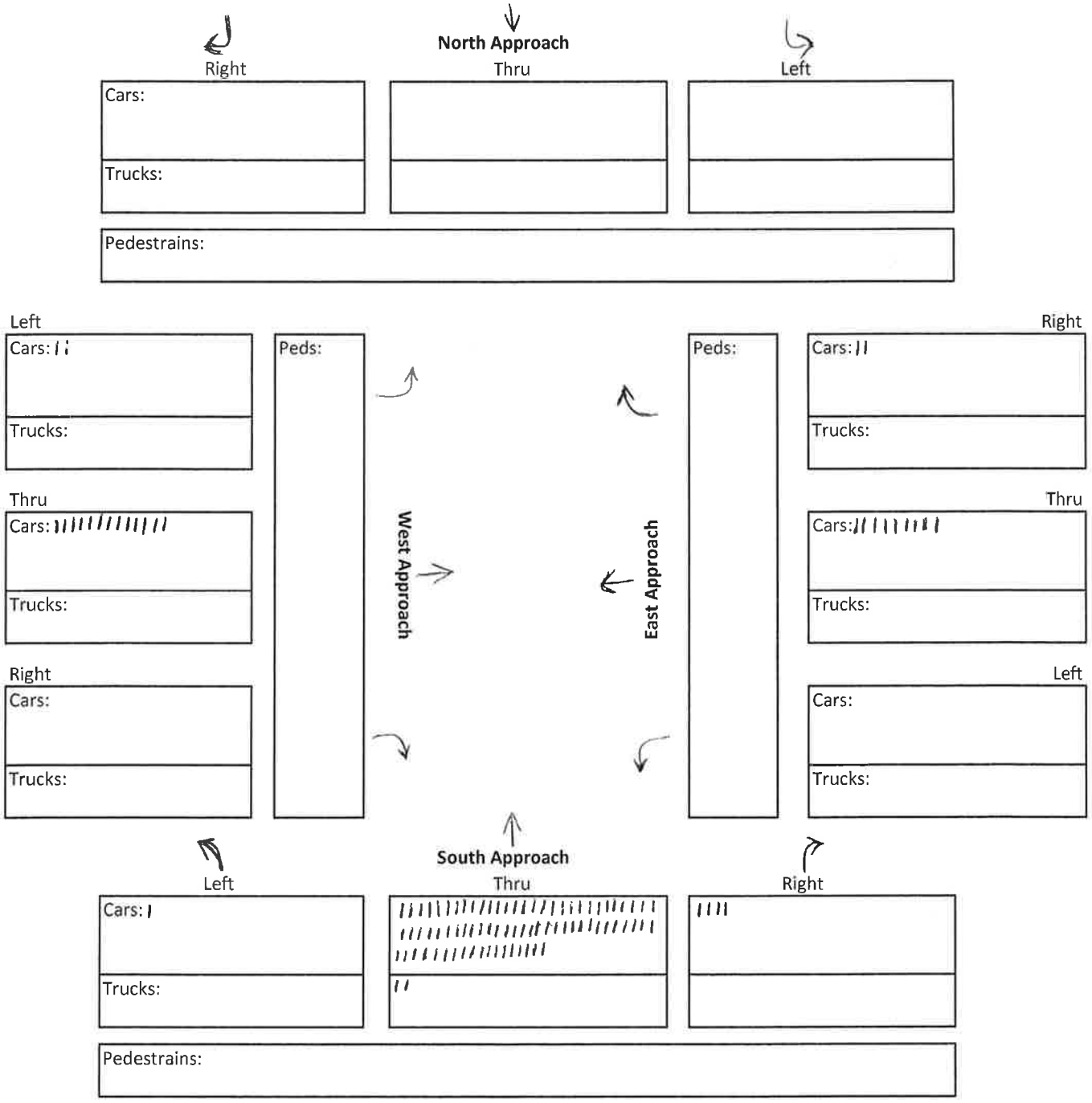
Intersection: 4Th and Gay ST.

Date: 4-24-12

Name: Brian Yerardi

Begin Time: 7:30 AM End Time: 8:45 AM

***Start a new sheet every 15 minutes.



(2)

Manual Intersection Counts

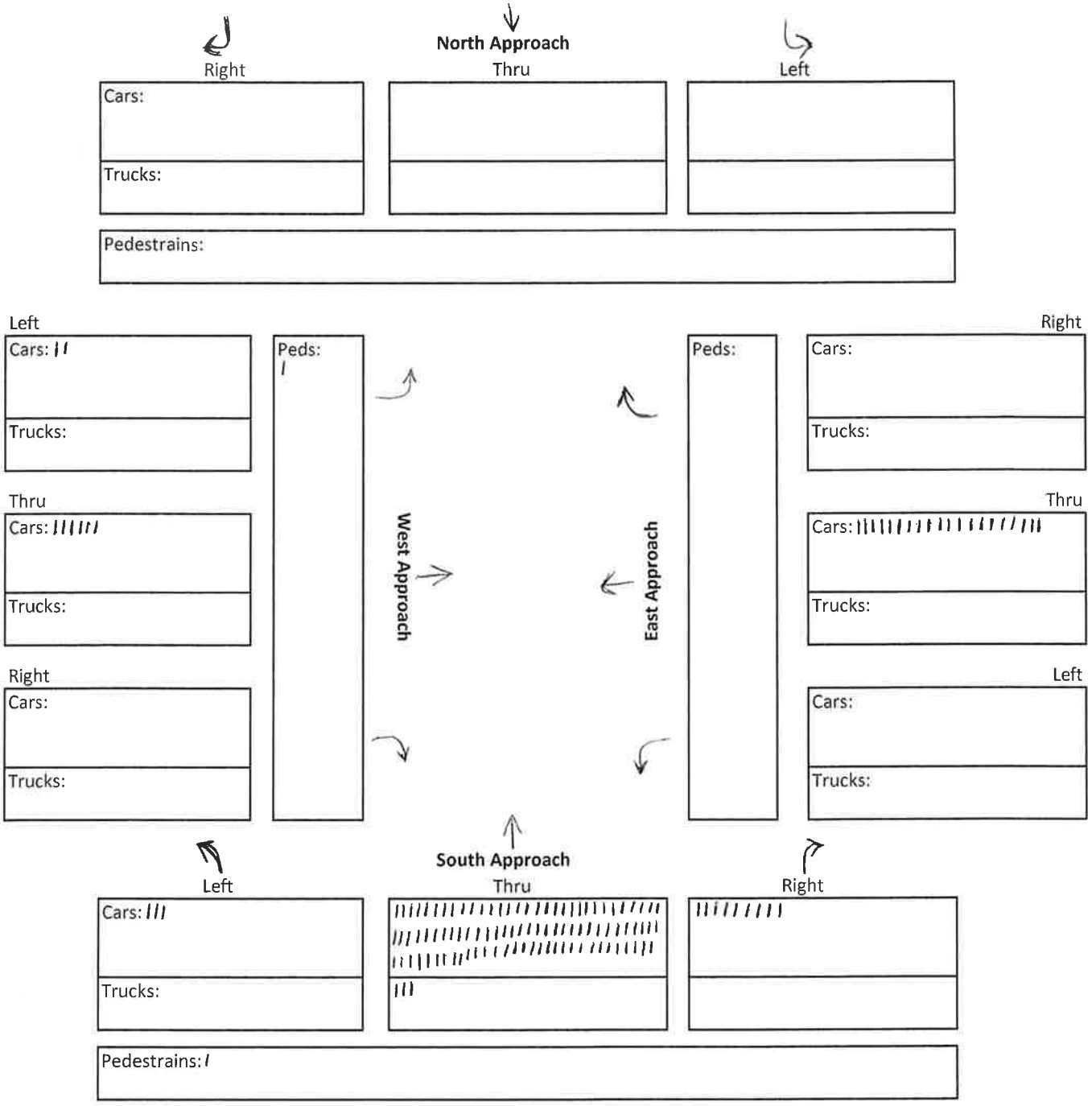
Intersection: 4th and Bay ST.

Date: 4-24-12

Name: Brian Yerardi

Begin Time: 7:45 Am End Time: 8:00 Am

***Start a new sheet every 15 minutes.



(3)

Manual Intersection Counts

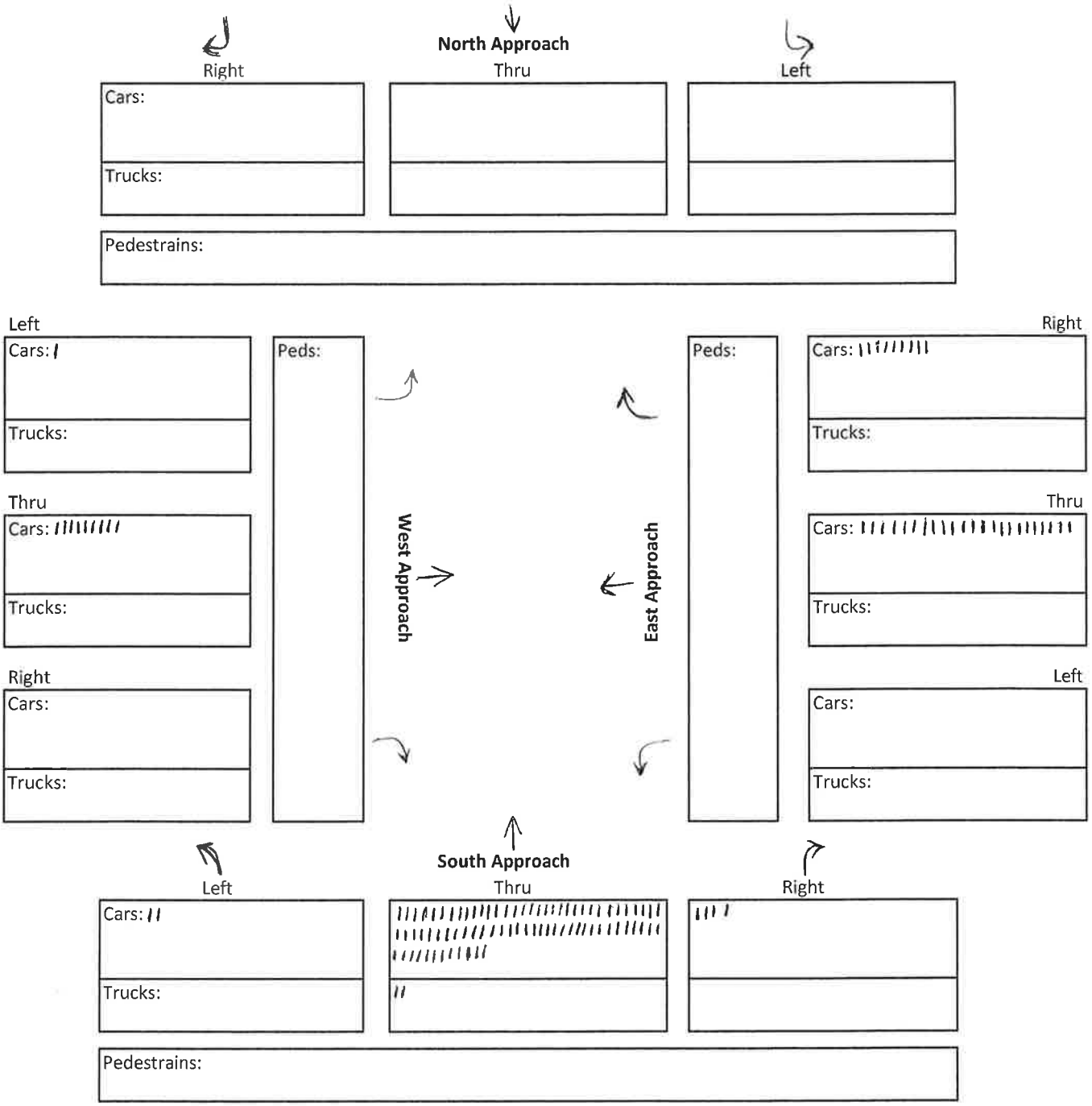
Intersection: [redacted] 4th and Gay ST.

Date: 4-24-12

Name: Brian Yerardi

Begin Time: 8:00 Am End Time: 8:15 Am

***Start a new sheet every 15 minutes.



(4)

Manual Intersection Counts

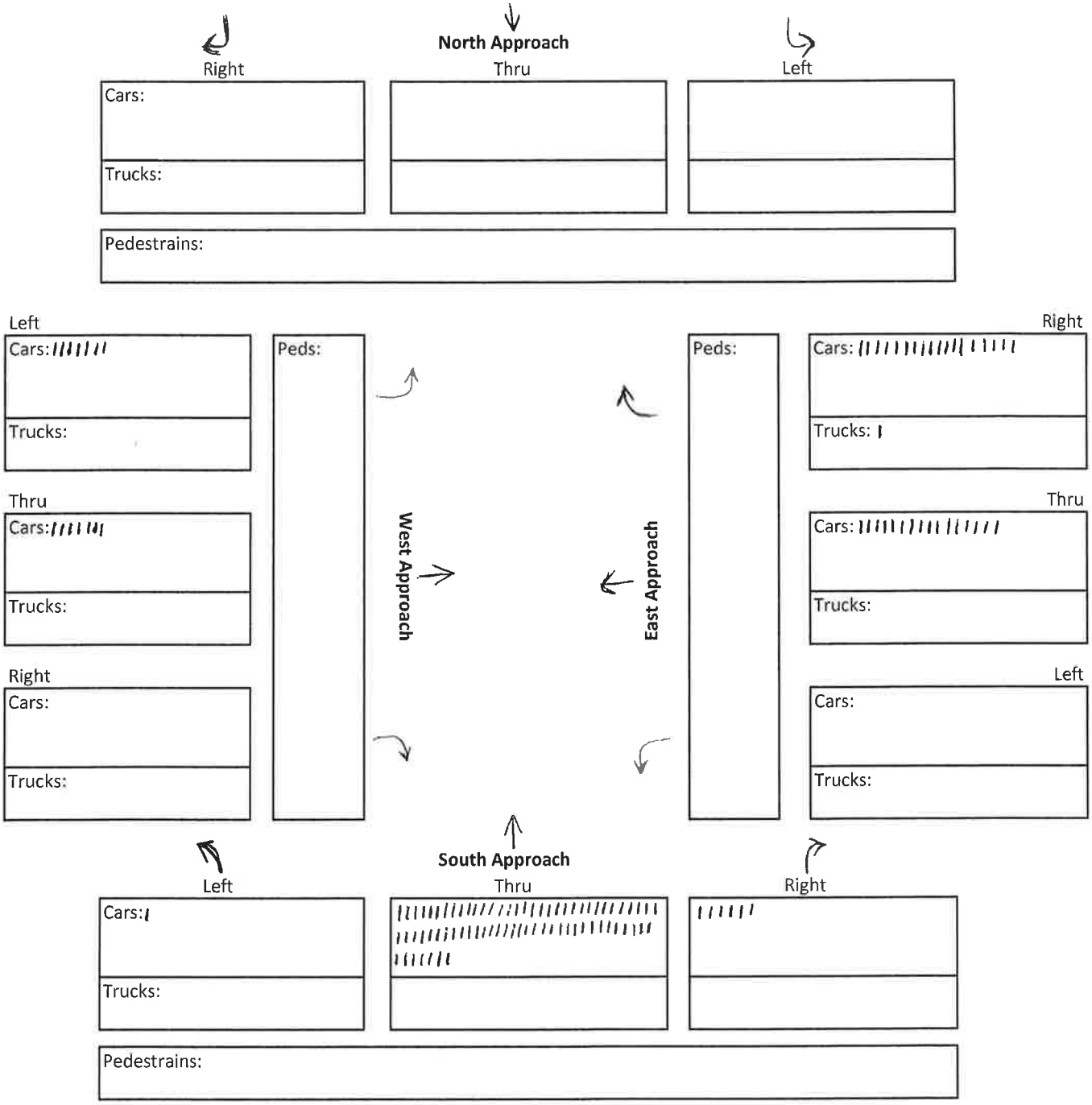
Intersection: 4th and Gay St.

Date: 4-24-12

Name: Brian Yerardi

Begin Time: 8:15 Am End Time: 8:30

***Start a new sheet every 15 minutes.



(5)

Manual Intersection Counts

Intersection: 4th and Gay St.
Date: 4-24-12
Name: Brian Yerardi
Begin Time: 4:30 Pm End Time: 4:45 Pm
***Start a new sheet every 15 minutes.

North Approach

Right
Cars:
Trucks:

Thru

Left

Pedestrains: ||

West Approach

Left
Cars: ||||||||||||
Trucks:

Thru
Cars: |||||||||||||||||
Trucks:

Right
Cars:
Trucks:

Peds:

East Approach

Peds:

Right
Cars: |||||||||
Trucks:

Thru
Cars: ||||||||||||||||||||||||
||||||||||||
Trucks:

Left
Cars:
Trucks:

South Approach

Left
Cars: |
Trucks:

Thru

Right
|||

Pedestrains: |||||

⑥

Manual Intersection Counts

Intersection: 4Th and Gay ST.
Date: 4-24-12
Name: Brian Yerardi
Begin Time: 4:45 Pm End Time: 5:00 Pm
***Start a new sheet every 15 minutes.

North Approach

	Right	Thru	Left
Cars:			
Trucks:			

Pedestrains: |||||

West Approach

	Left	Thru	Right
Cars:	||||||||||	||||||||||||||	
Trucks:			

Peds: |

East Approach

	Right	Thru	Left
Cars:	||||||||||	|||||||||||||||||	
Trucks:			

Peds: |

South Approach

	Left	Thru	Right
Cars:	||	||||||||||||||||||||||||||||||||| ||||||||||||||||||||||||||||||||| ||||||||||||||||||||||||||||||||| ||||||||	|||
Trucks:		||	

Pedestrains:

(7)

Manual Intersection Counts

Intersection: 4th and Gay ST.

Date: 4-24-12

Name: Brian Yerardi

Begin Time: 5:00 Pm End Time: 5:15 Pm

***Start a new sheet every 15 minutes.

North Approach

Right	Thru	Left
Cars:		
Trucks:		

Pedestrains: ||||

West Approach

Left
Cars: ||||||||||
Trucks:

Thru
Cars: ||||||||
Trucks:

Right
Cars:
Trucks:

Peds:

East Approach

Peds: |

Right
Cars: ||||||
Trucks:

Thru
Cars: ||||||||||||||||||||||||
Trucks:

Left
Cars:
Trucks:

South Approach

Left	Thru	Right
Cars: ||||		|||||
Trucks:		

Pedestrains:

(8)

Manual Intersection Counts

Intersection: 4th and Gay ST.

Date: 4-24-12

Name: Brian Yerardi

Begin Time: 5:15 Pm End Time: 5:30 Pm

***Start a new sheet every 15 minutes.

North Approach

Right	Thru	Left
Cars:		
Trucks:		

Pedestrains:

West Approach

Left
Cars: ||||
Trucks:

Thru
Cars: |||||||| |||||||
Trucks:

Right
Cars:
Trucks:

Peds:

East Approach

Peds: |

Right
Cars: ||||||||||
Trucks:

Thru
Cars: |||||| |||||||||
Trucks:

Left
Cars:
Trucks:

South Approach

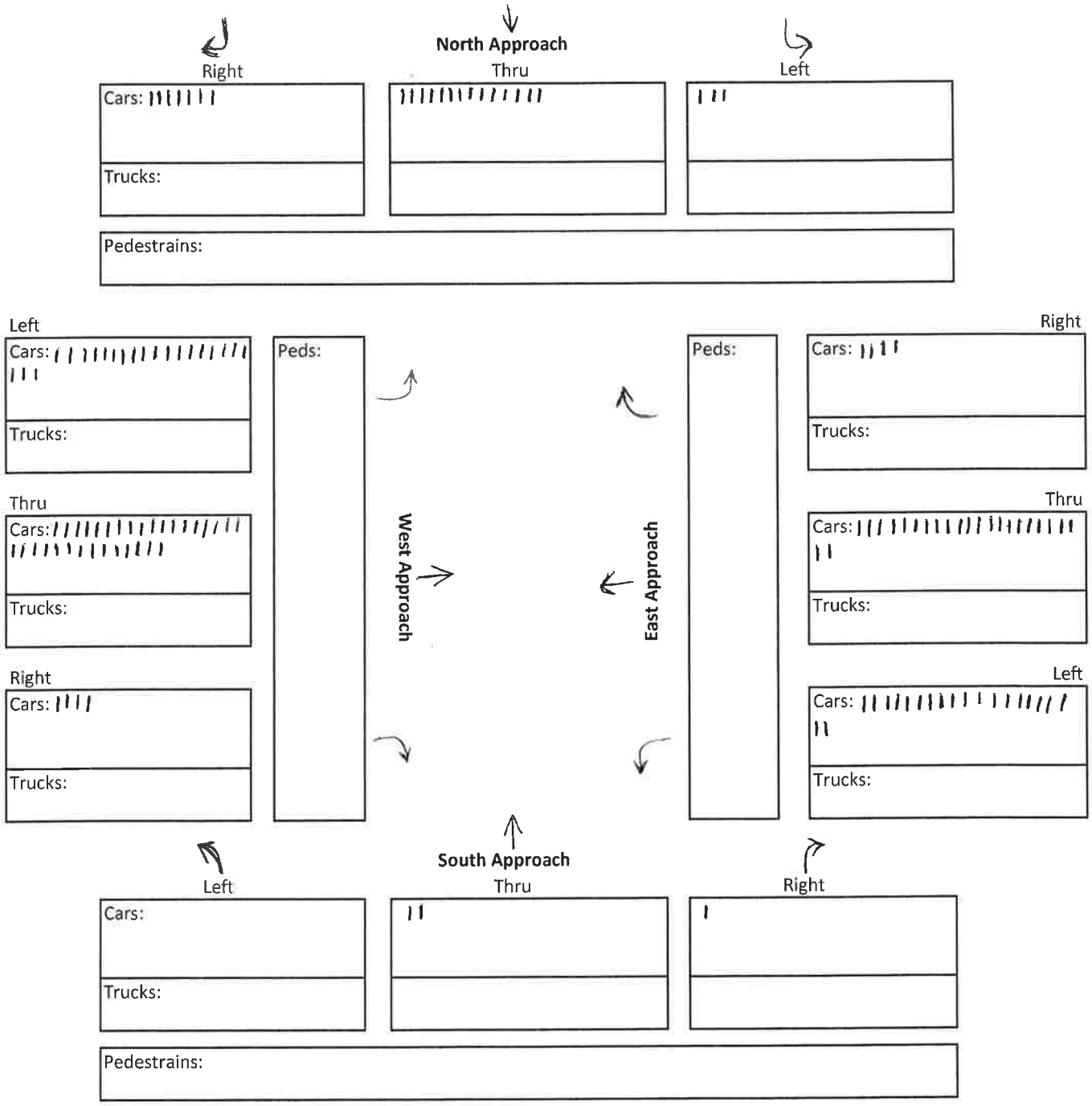
Left	Thru	Right
Cars:		
Trucks:		

Pedestrains:

(1)

Manual Intersection Counts

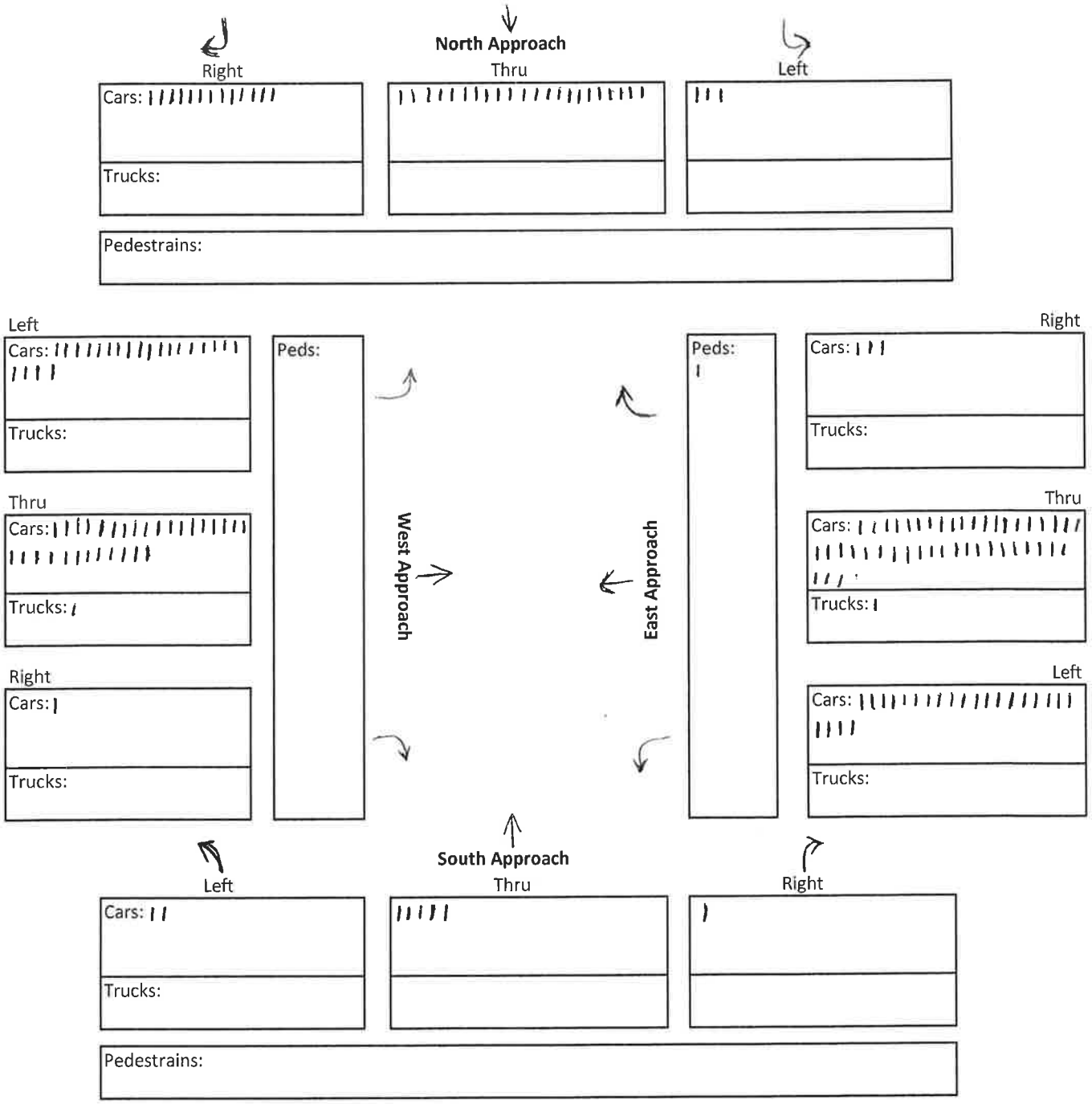
Intersection: 3rd St. and Waller St.
Date: 4-19-12
Name: Brian Yerardi
Begin Time: 7:30 Am End Time: 7:45 Am
***Start a new sheet every 15 minutes.



(2)

Manual Intersection Counts

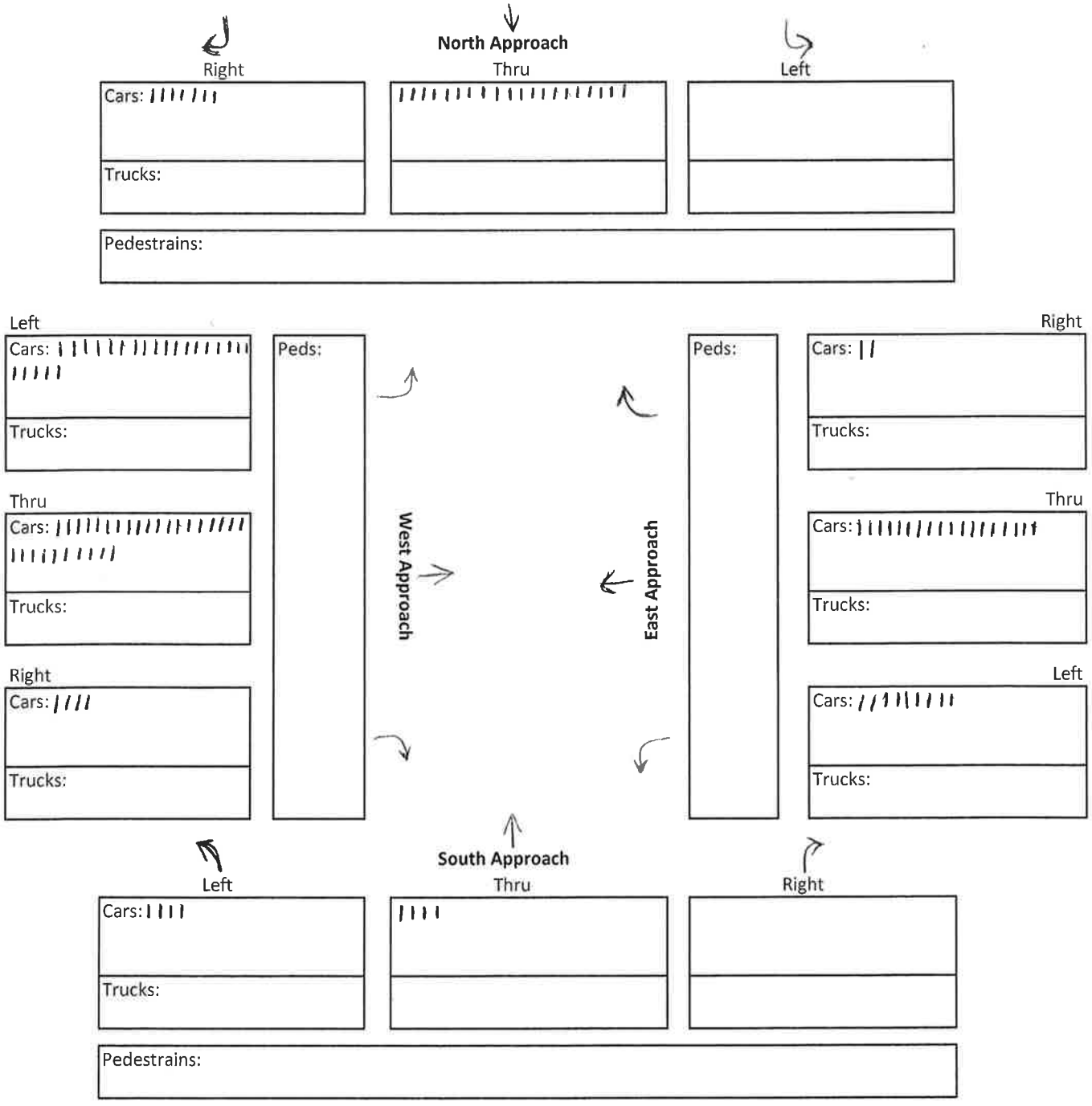
Intersection: 3rd St. and Waller St.
Date: 4-19-12
Name: Brian Yerardi
Begin Time: 7:45 AM End Time: 8:00 am
***Start a new sheet every 15 minutes.



③

Manual Intersection Counts

Intersection: 3rd ST. and Waller ST.
Date: 4-19-12
Name: Brian Yerardi
Begin Time: 8:00 Am End Time: 8:15 Am
***Start a new sheet every 15 minutes.



(4)

Manual Intersection Counts

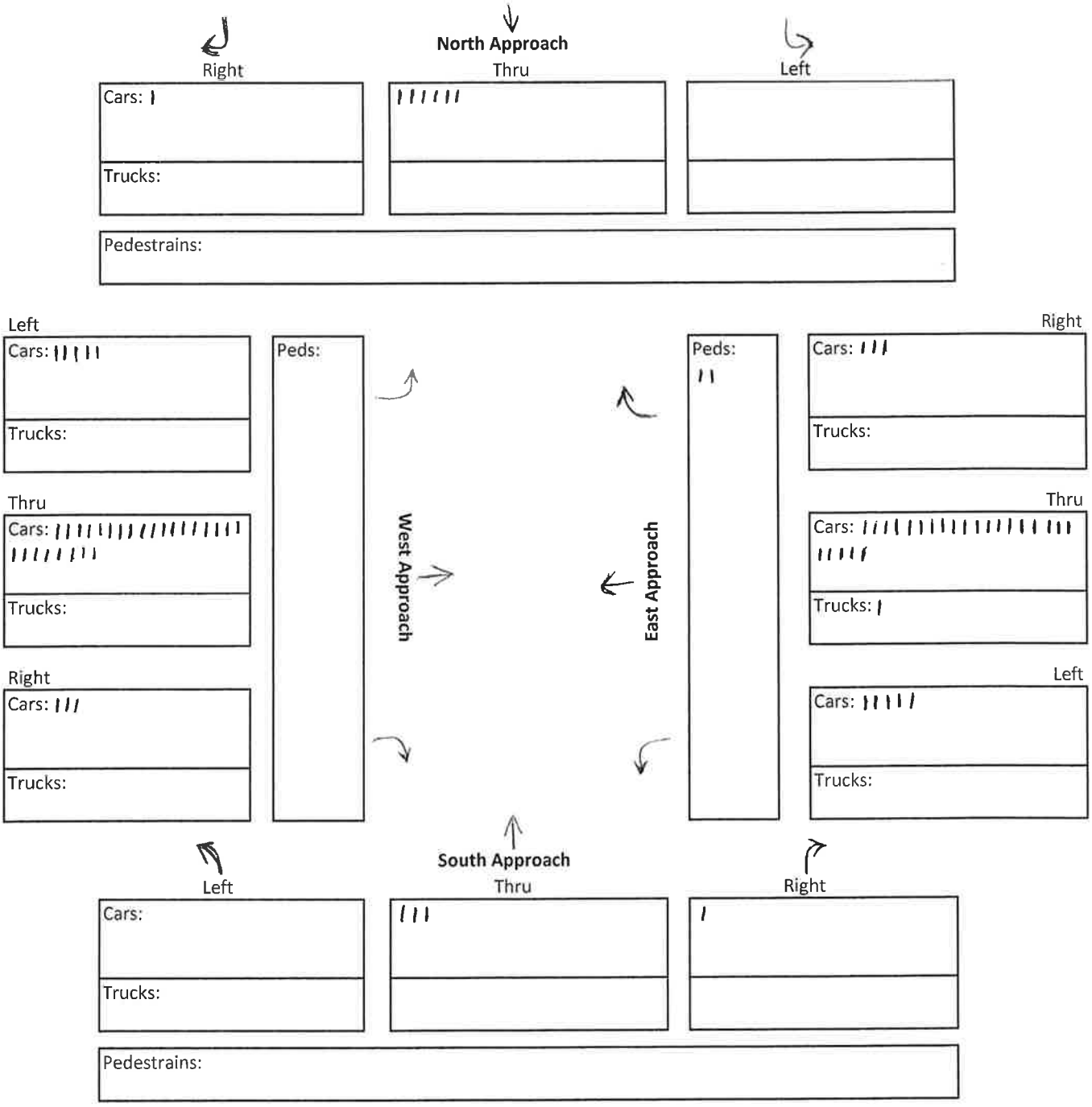
Intersection: 3rd St. and Waller St.

Date: 4-19-12

Name: Brian Yerardi

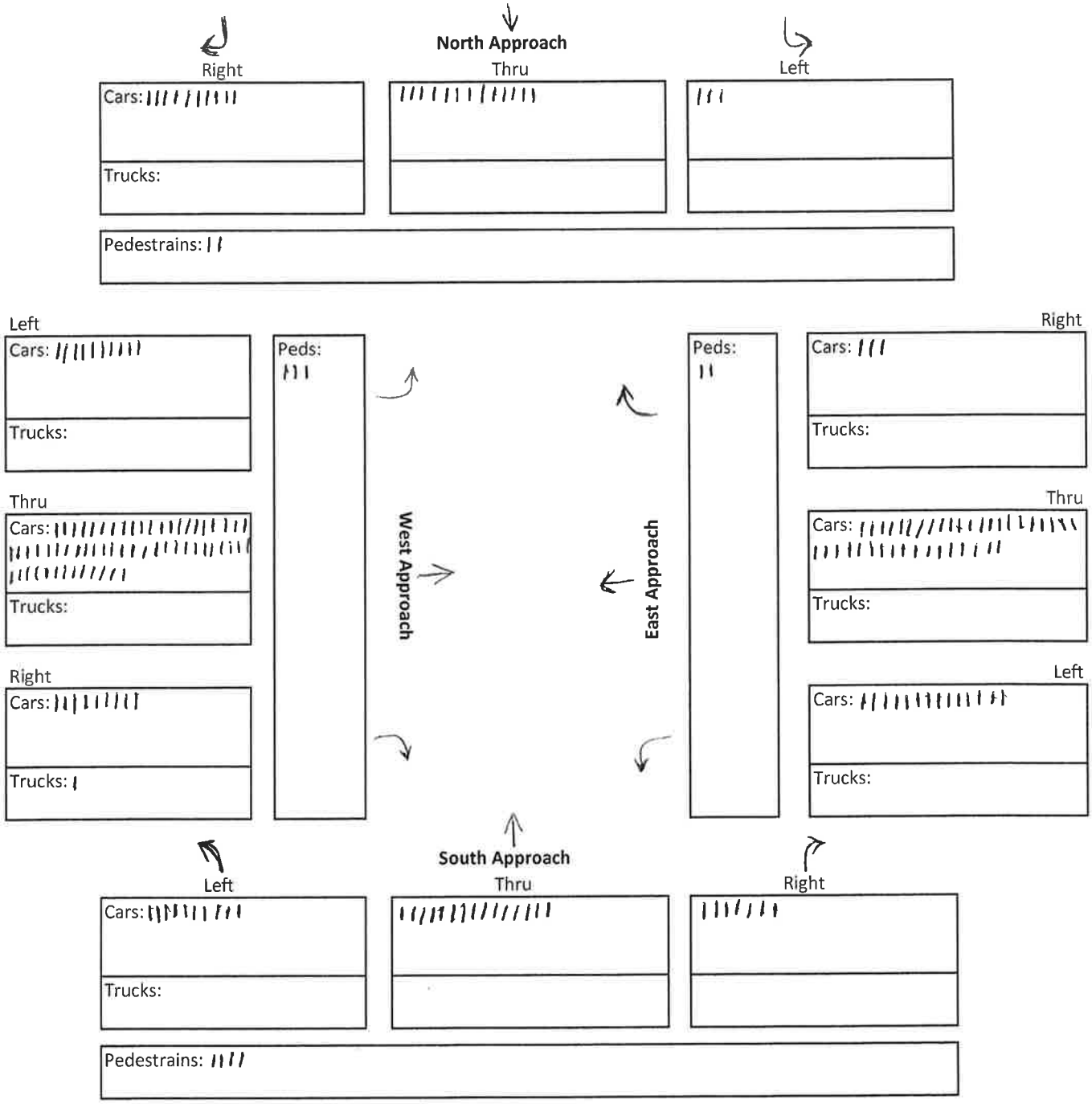
Begin Time: 8:15 Am End Time: 8:30 Am

***Start a new sheet every 15 minutes.



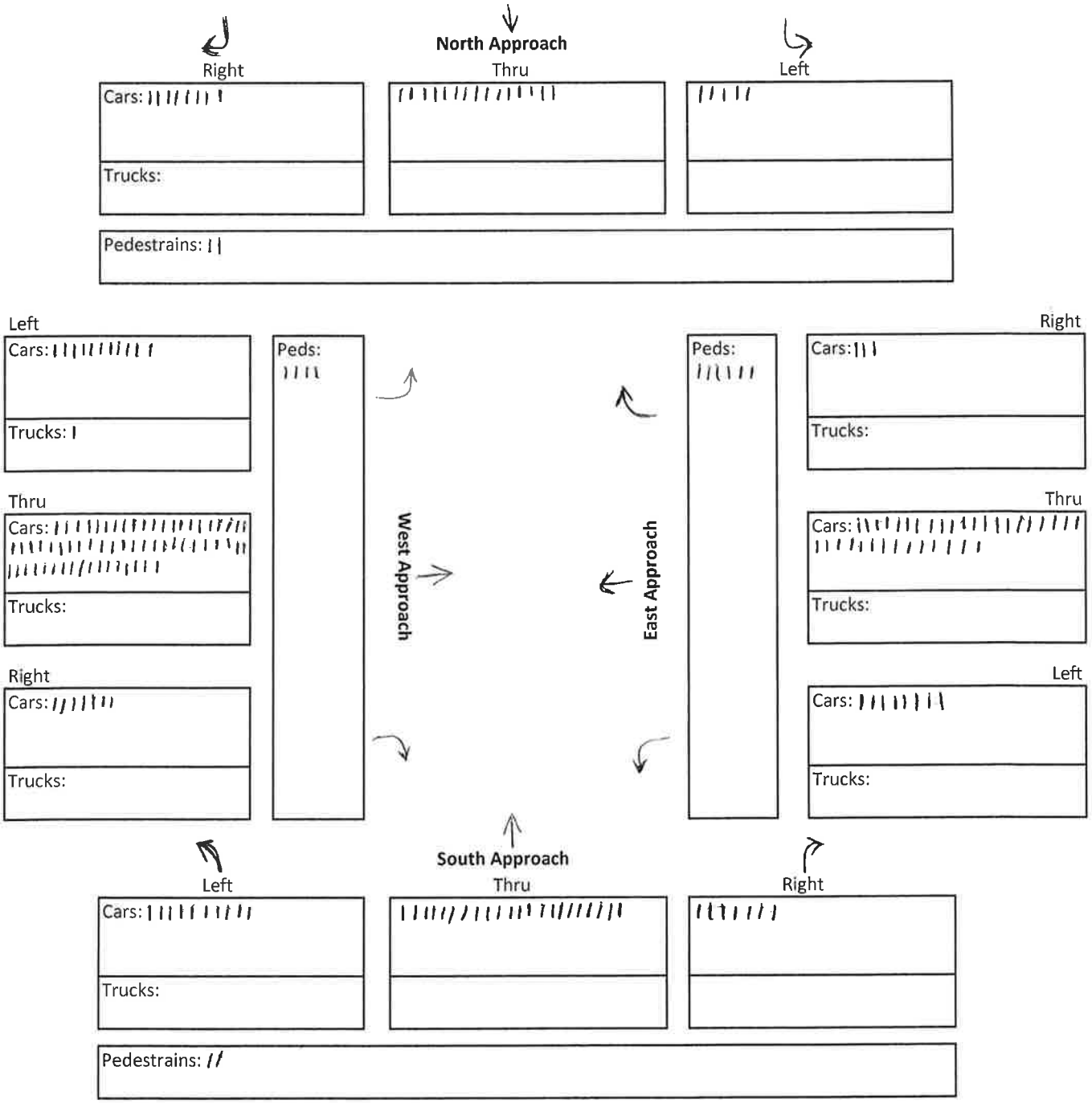
Manual Intersection Counts

Intersection: 3rd St. and Waller St.
Date: 4-19-12
Name: Brian Yerardi
Begin Time: 4:30 pm. End Time: 4:45 pm.
***Start a new sheet every 15 minutes.



Manual Intersection Counts

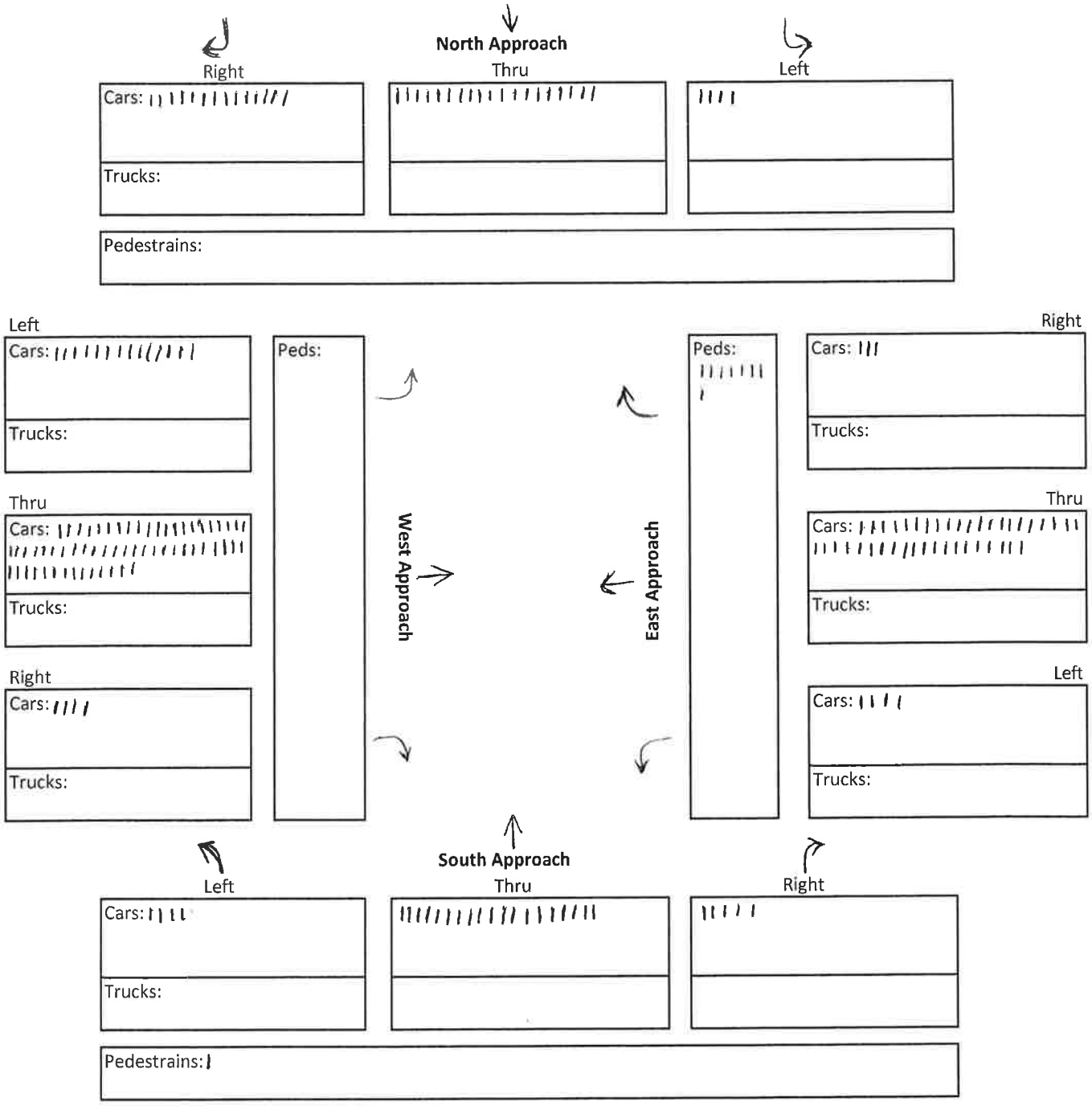
Intersection: 3rd and Waller ST.
Date: 4-19-12
Name: Brian Yeracaris
Begin Time: 4:45 Pm End Time: 5:00 Pm
***Start a new sheet every 15 minutes.



(7)

Manual Intersection Counts

Intersection: 3rd and Waller ST.
Date: 4-19-12
Name: Brian Yeracdi
Begin Time: 5:00 pm End Time: 5:15 pm
***Start a new sheet every 15 minutes.



8

Manual Intersection Counts

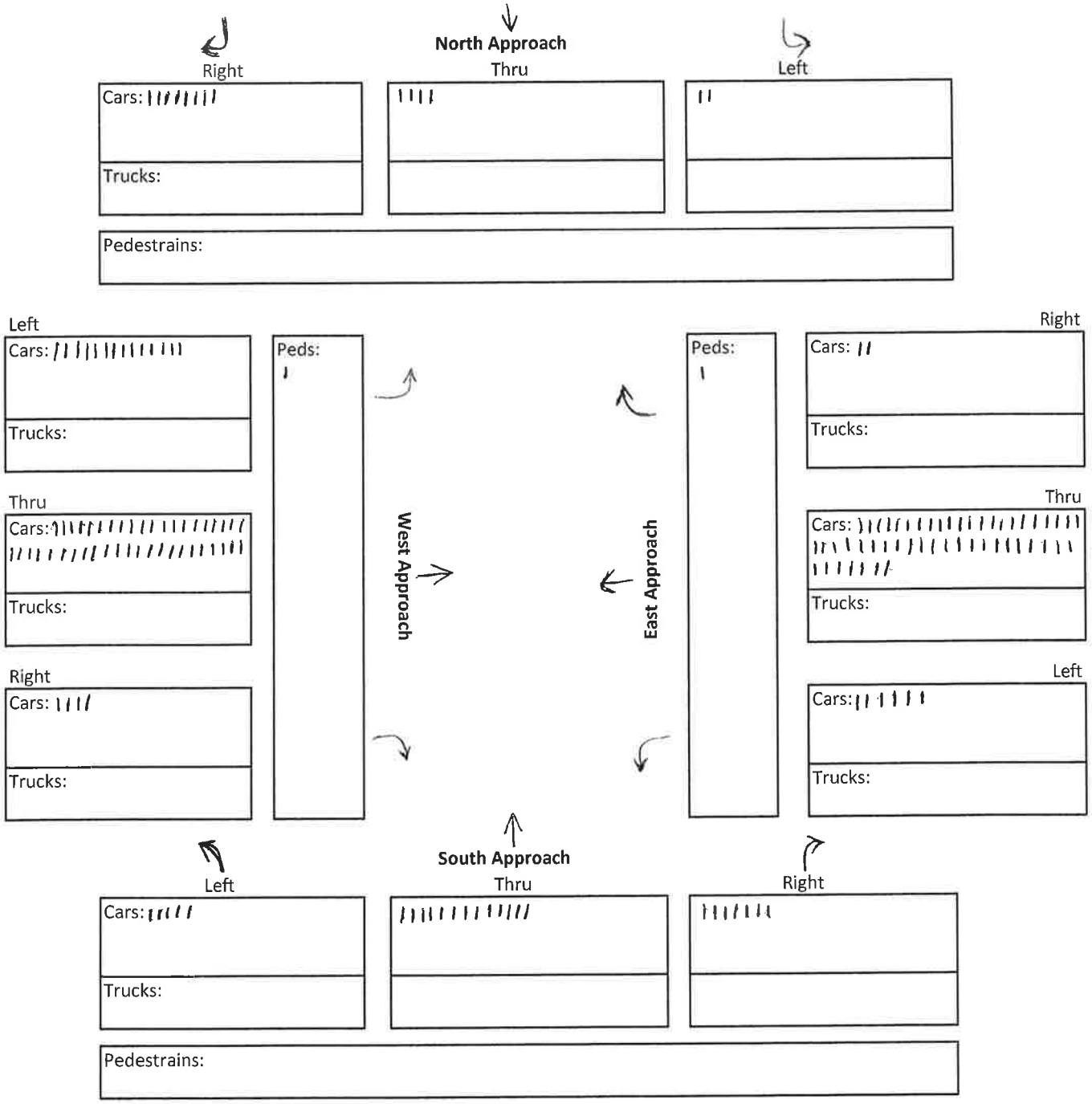
Intersection: 3rd and Waller ST.

Date: 4-19-12

Name: Brian Yerardi

Begin Time: 5:15 pm End Time: 5:30 pm

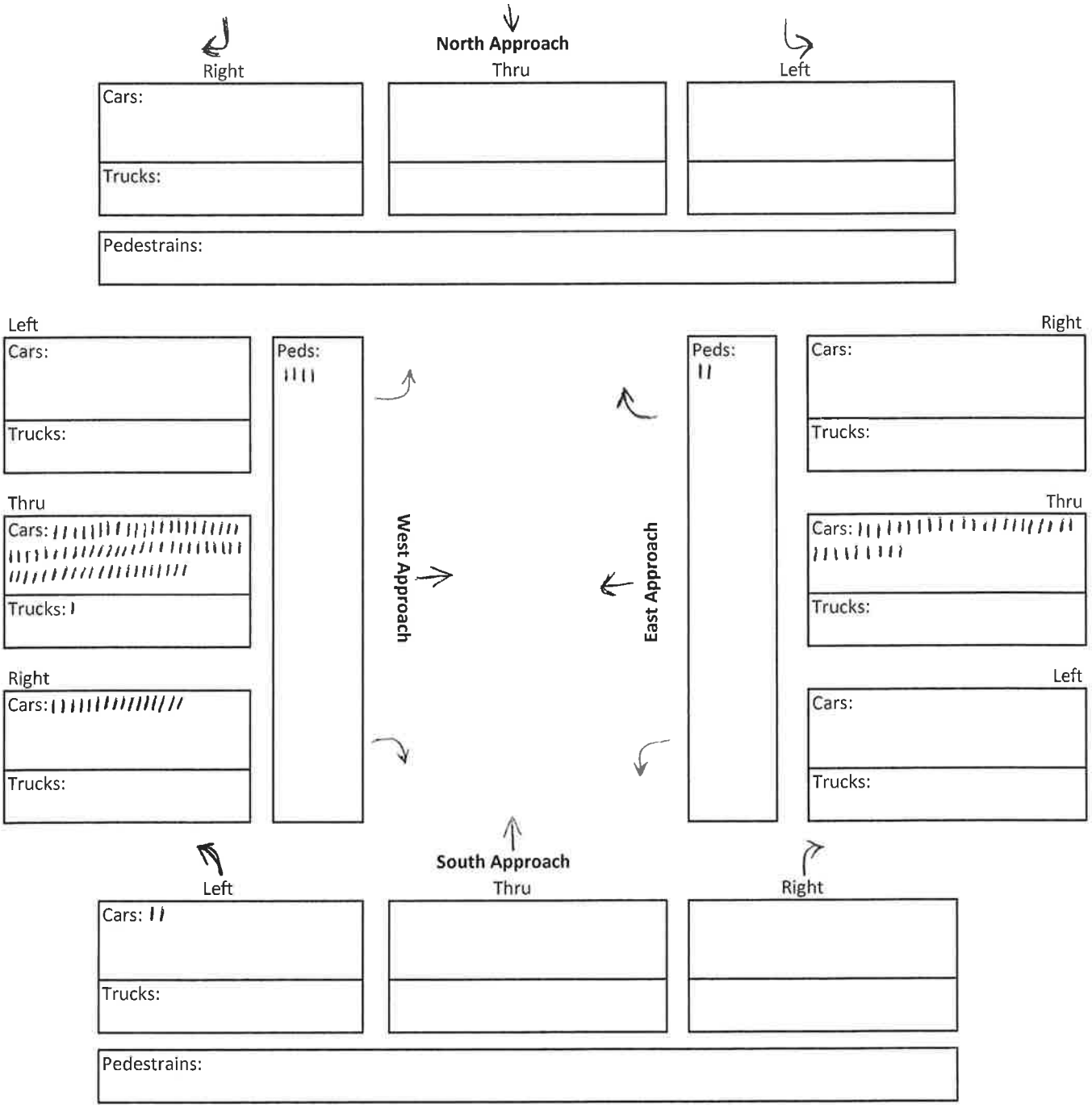
***Start a new sheet every 15 minutes.



(1)

Manual Intersection Counts

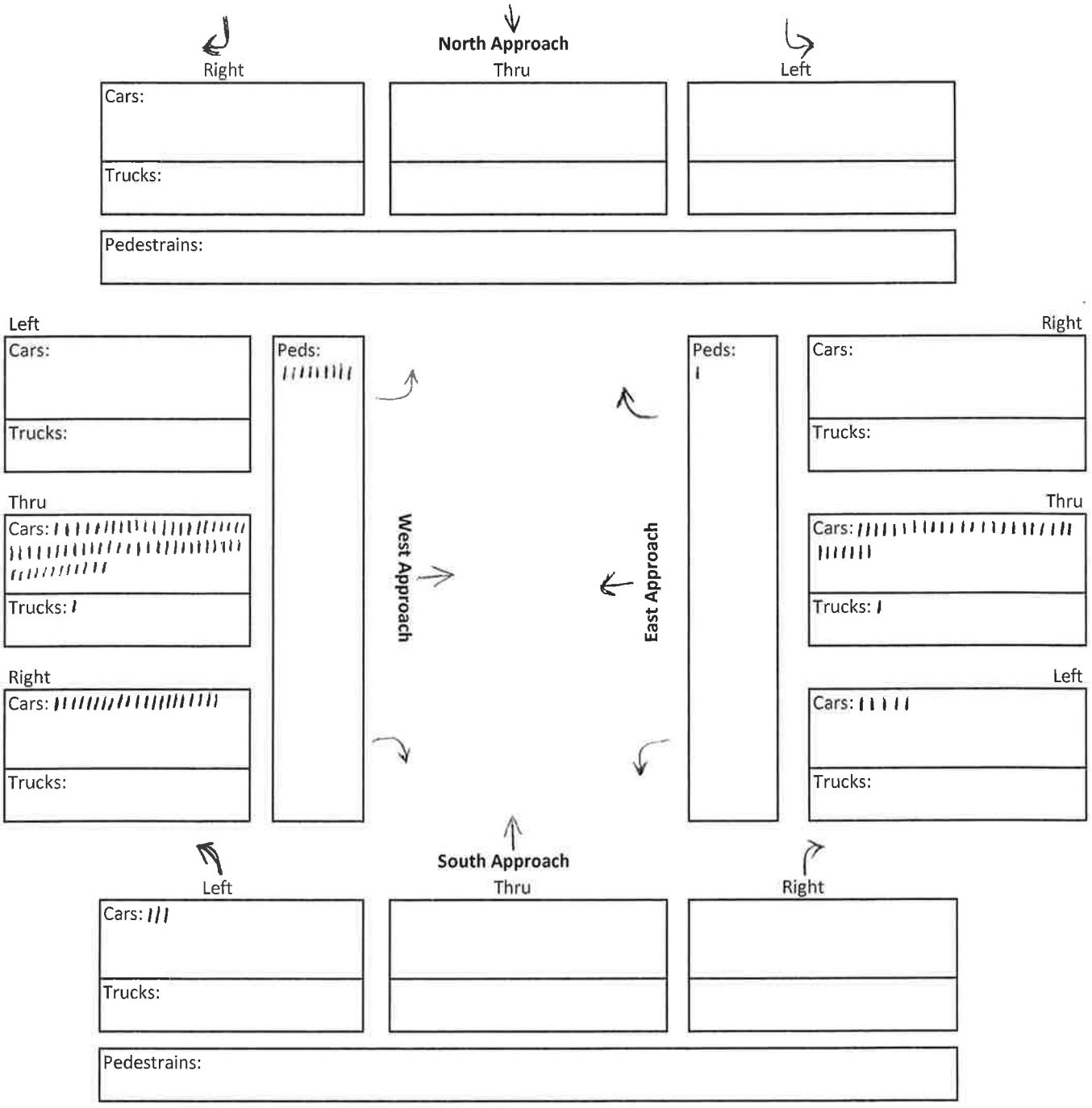
Intersection: Entrance To SSU at 3rd ST.
Date: 4-23-12
Name: Brian Yerardi
Begin Time: 7:30 Am End Time: 7:45 Am
***Start a new sheet every 15 minutes.



(2)

Manual Intersection Counts

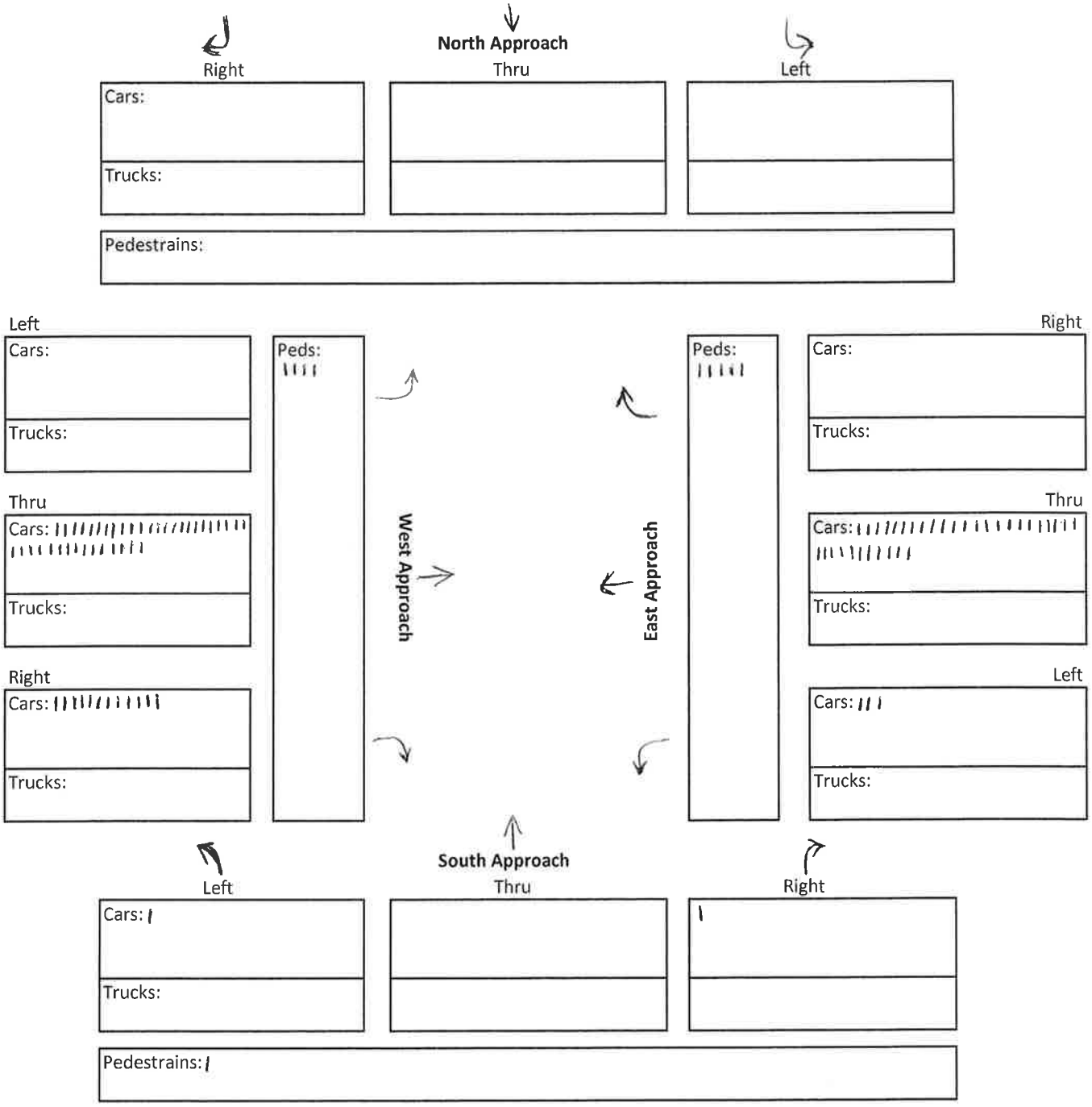
Intersection: SSU Entrance at 3rd ST.
Date: 4-23-12
Name: Brian Yerardi
Begin Time: 7:45 AM End Time: 8:00 AM
***Start a new sheet every 15 minutes.



(3)

Manual Intersection Counts

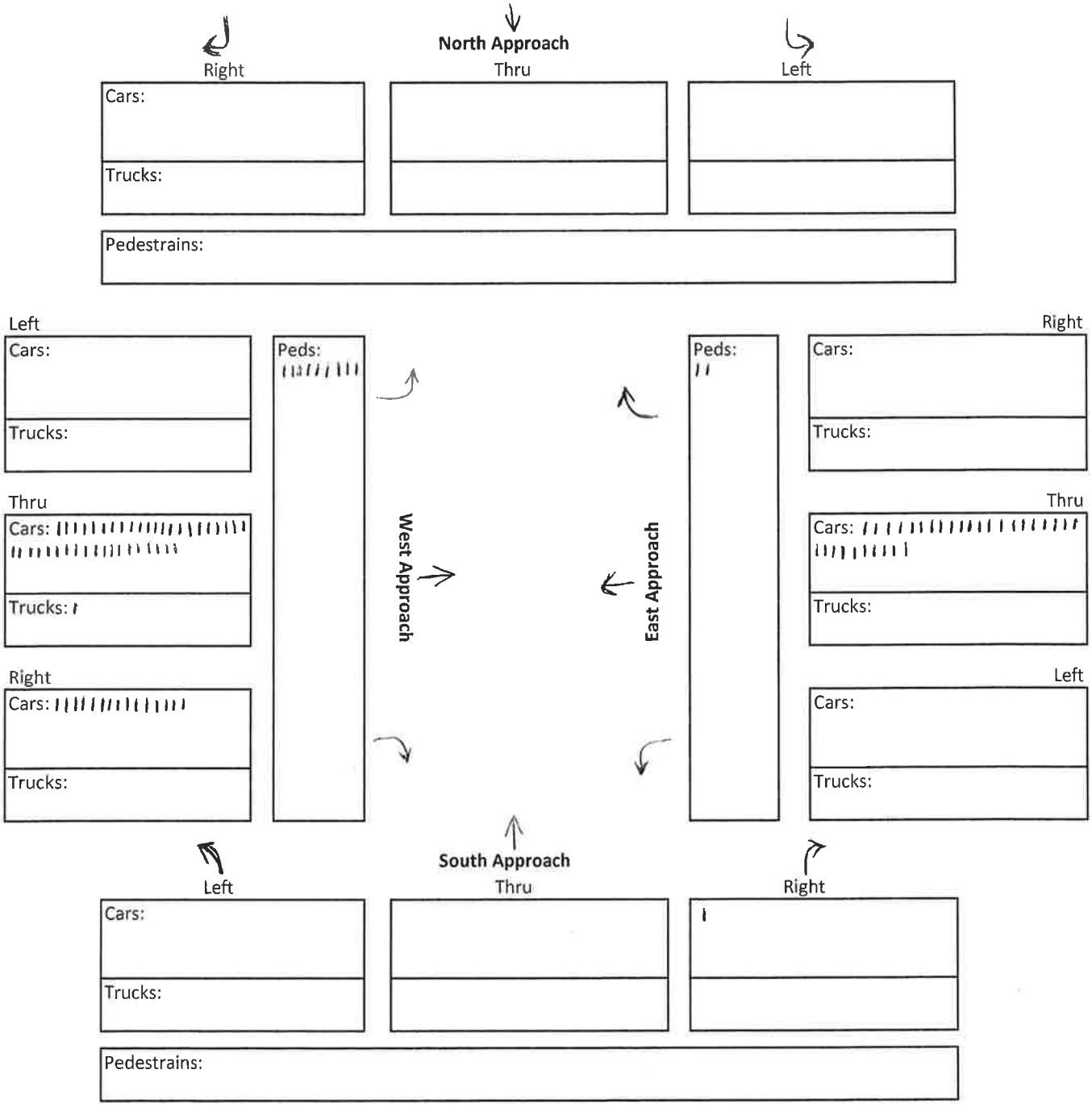
Intersection: SSU Entrance at 3rd ST.
Date: 4-23-12
Name: Brian Yerardi
Begin Time: 8:00 AM End Time: 8:15 AM
***Start a new sheet every 15 minutes.



(4)

Manual Intersection Counts

Intersection: SSU Entrance at 3rd ST.
Date: 4-23-12
Name: Brian Yerardi
Begin Time: 8:15 AM End Time: 8:30 AM
***Start a new sheet every 15 minutes.



SSU Count Schedule

Date	Person 1	Person 2
4/18/2012	Waller St. @ 3rd St.	SS Office entrance @ 4th St.
4/19/2012	SSU entrance @ 3rd St.	SS Office alley @ 4th St.
4/23/2012	Glover St. @ 4th St.	BWC Office entrance @ 4th St.
4/24/2012	4th St. @ Gay St.	
4/25/2012		
4/26/2012		

Intersection Count; 7:30 - 8:30 AM and 4:30 - 5:30 PM

Office Count; Peak Hours - ???

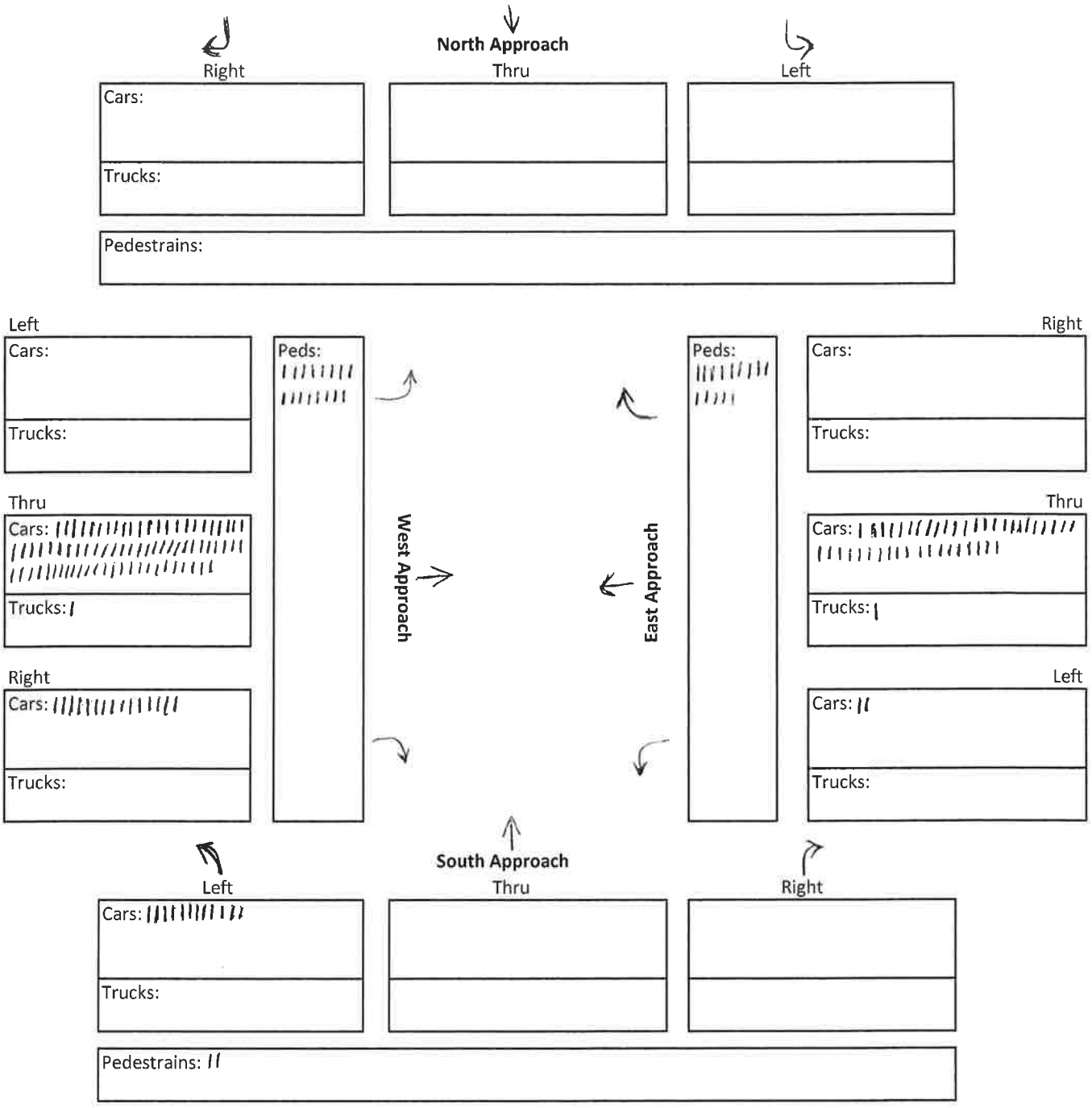
Pedestrian Count; One Hour - What Hour???

BwC 9-10 - 11:45 - 12:45 - 2:45 - 3:45

5

Manual Intersection Counts

Intersection: 3rd St. and Sinton St. SSU Entrance
Date: 4-23-12
Name: Brian Yerardi
Begin Time: 4:30 Pm End Time: 4:45 Pm
***Start a new sheet every 15 minutes.



Manual Intersection Counts

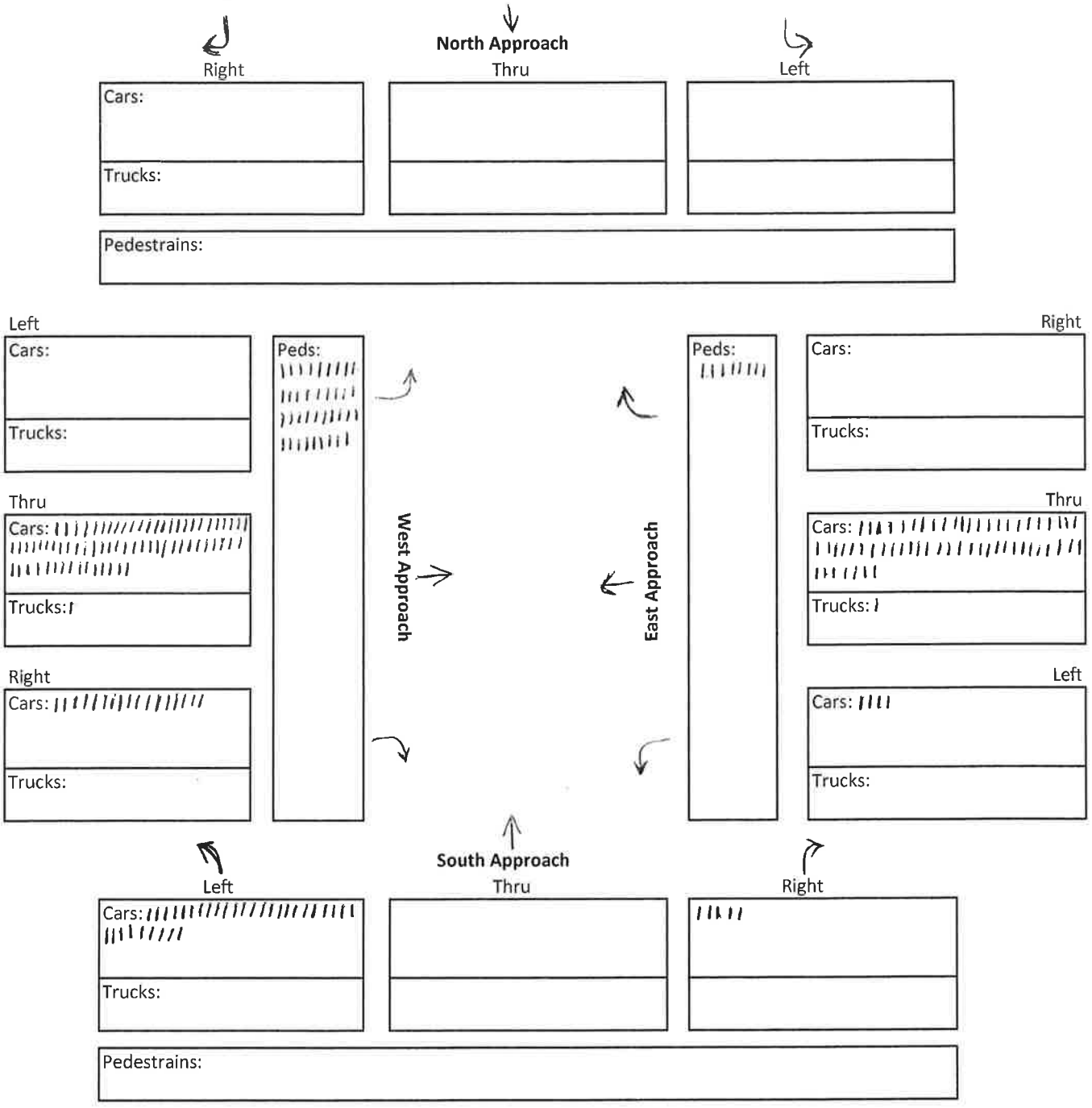
Intersection: 3rd and Sinton St. SSU Entrance

Date: 4-23-12

Name: Brian Yerardi

Begin Time: 4:45 pm End Time: 5:00 pm

***Start a new sheet every 15 minutes.



Manual Intersection Counts

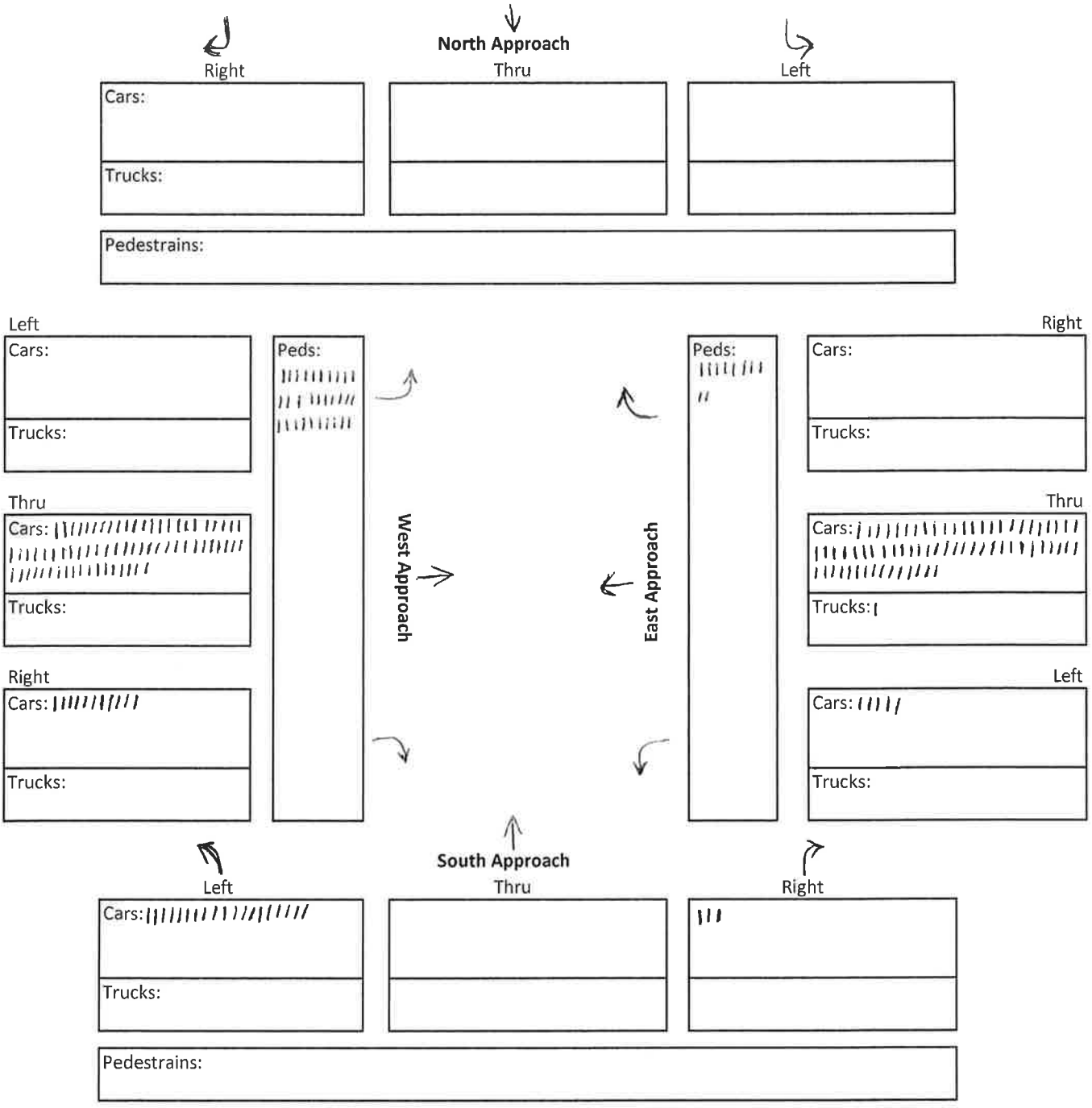
Intersection: 3rd and Sinton St. SSU Entrance

Date: 4-23-12

Name: Brian Yerardi

Begin Time: 5:00 pm End Time: 5:15 pm

***Start a new sheet every 15 minutes.



Manual Intersection Counts

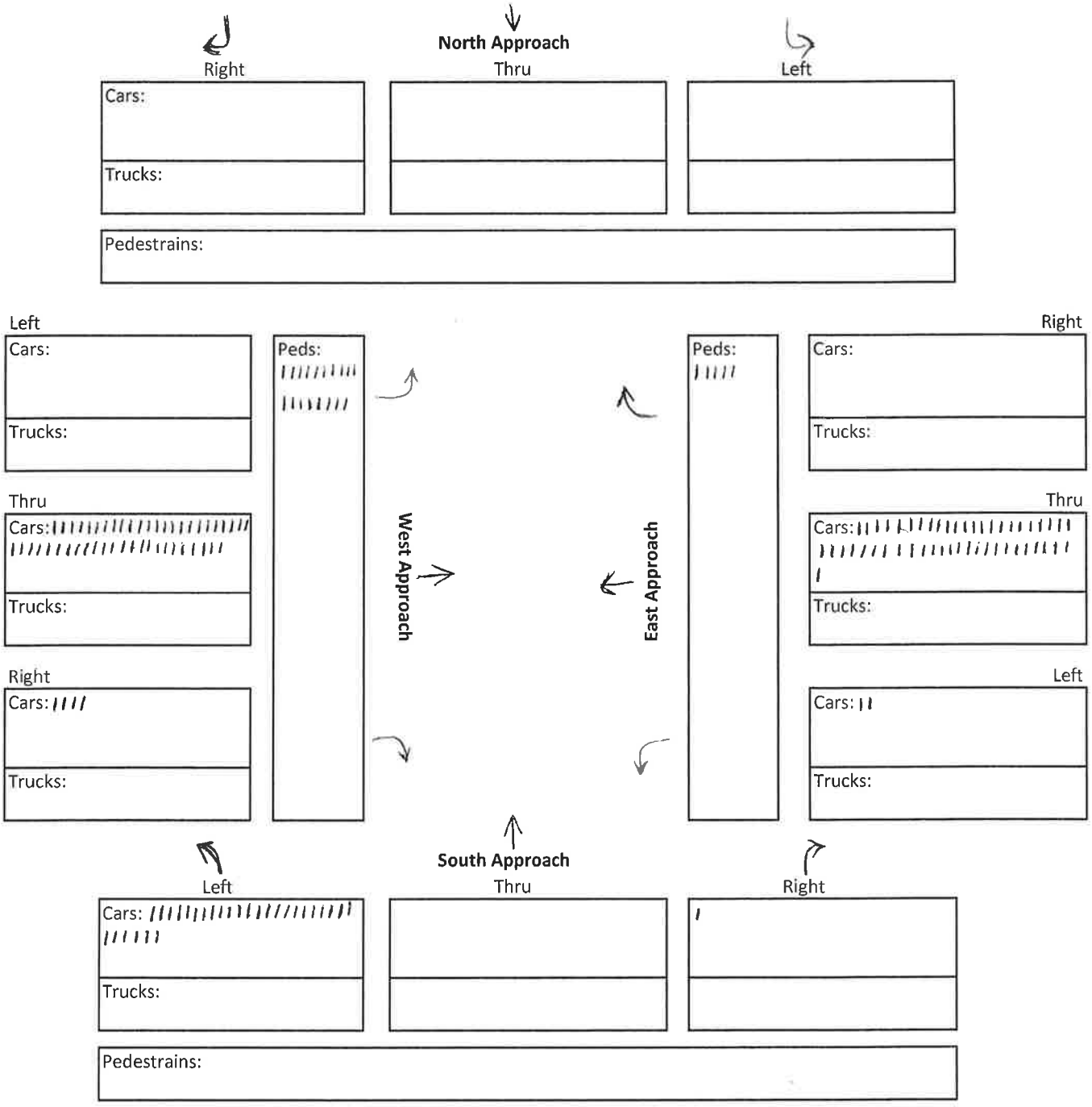
Intersection: 3rd St. and Sinton SSU Entrance

Date: 4-23-12

Name: Brian Verardi

Begin Time: 5:15 Pm End Time: 5:30 Pm

***Start a new sheet every 15 minutes.



(1)

SS Office alley example

Manual Intersection Counts

Intersection: Social Security Alley at 4th St.
Date: 4-19-12
Name: Brian Yerardi
Begin Time: 9:00 Am End Time: 9:15 Am
***Start a new sheet every 15 minutes.

North Approach

from office just using alley

Right	Thru	Left
Cars: IIIII		I
Trucks:		

Pedestrains:

West Approach

Left
Cars:
Trucks:

Thru
Cars:
Trucks:

Right
Cars:
Trucks:

Peds:

East Approach

Peds:

Right
Cars:
Trucks:

Thru
Cars:
Trucks:

Left
Cars:
Trucks:

South Approach

Left	Thru	Right
Cars:		
Trucks:		

Pedestrains:

(2)

SS office alley example

Manual Intersection Counts

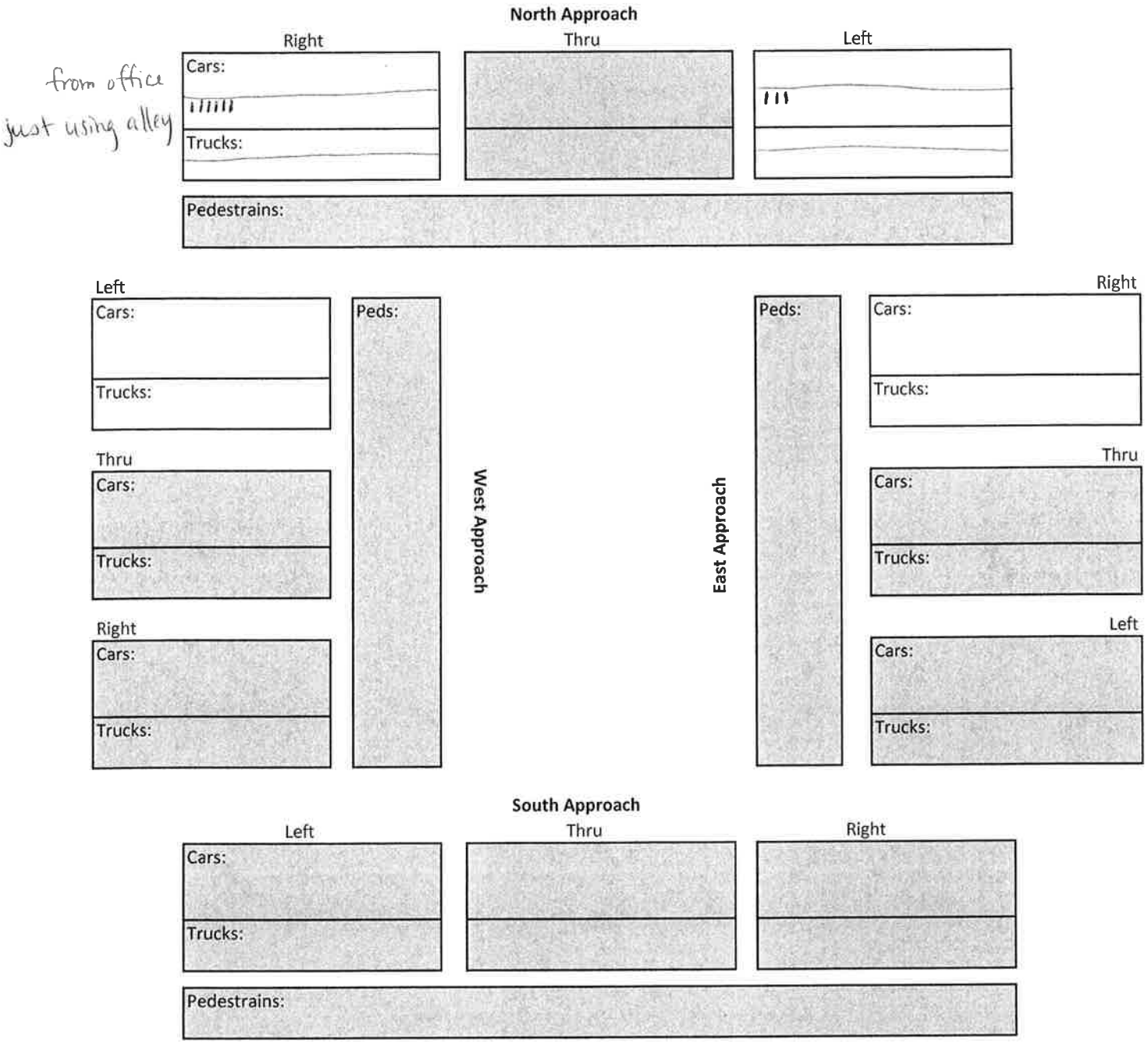
Intersection: Social Security Alley at 4th St.

Date: 4-19-12

Name: Brian Yeracdi

Begin Time: 9:15 Am End Time: 9:30 Am

***Start a new sheet every 15 minutes.



(3)

SS office alley example

Manual Intersection Counts

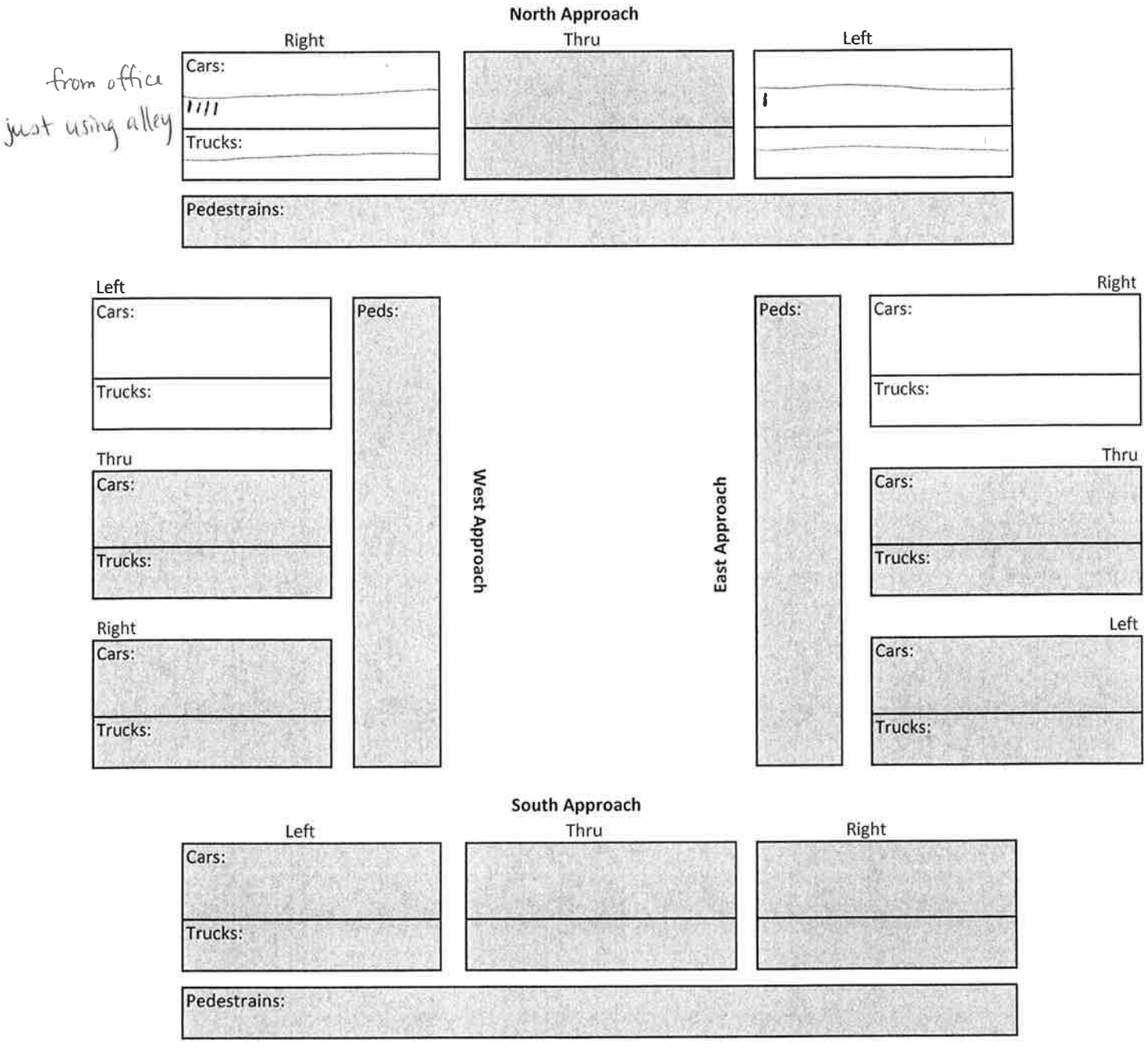
Intersection: Social Security Alley at 4th St.

Date: 4-19-12

Name: Brian Verardi

Begin Time: 9:30 Am End Time: 9:45 Am

***Start a new sheet every 15 minutes.



(4)

SS office alley example

Manual Intersection Counts

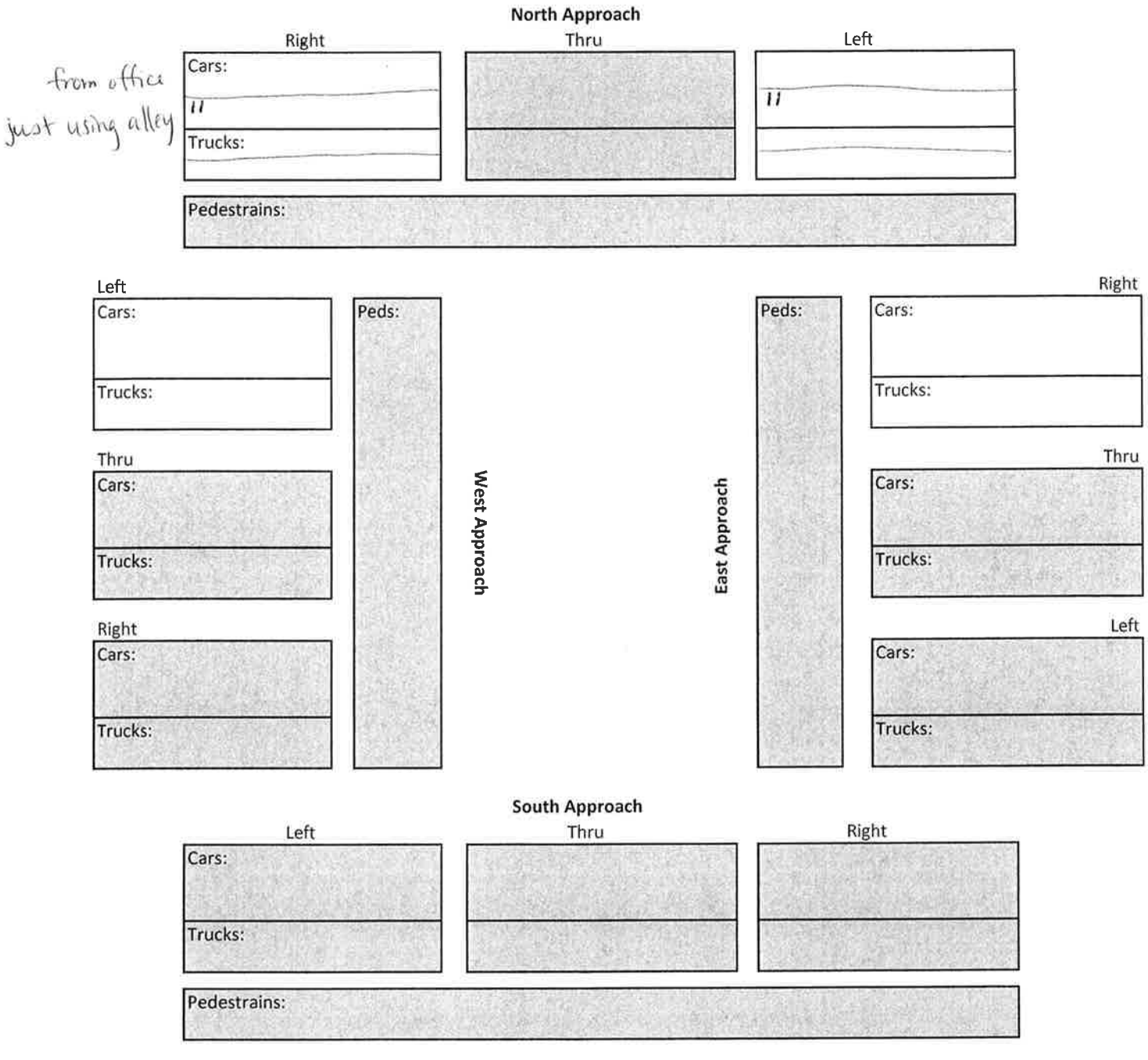
Intersection: Social Security Alley at 4th ST.

Date: 4-19-12

Name: Brian Yerardi

Begin Time: 9:45 Am End Time: 10:00 Am

***Start a new sheet every 15 minutes.



(5)

SS office alley example

Manual Intersection Counts

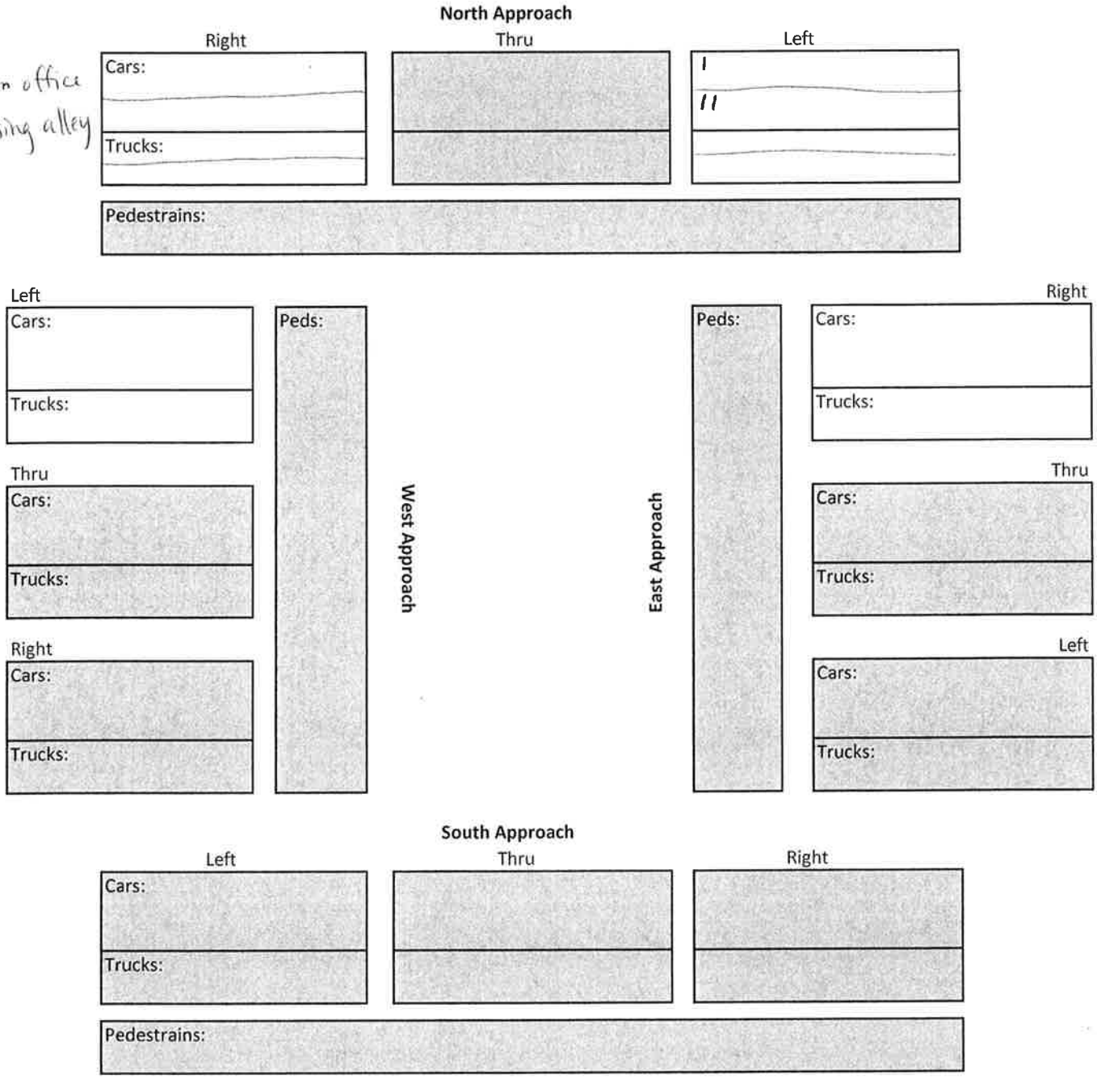
Intersection: Social Security Alley at 4th St.

Date: 4-19-12

Name: Brian Yerardi

Begin Time: 11:45 Am End Time: 12:00 Am

***Start a new sheet every 15 minutes.



(6)

SS Office alley example

Manual Intersection Counts

Intersection: Social Security Alley. 4th ST.

Date: 4-19-12

Name: Brian Yerardi

Begin Time: 12:00 Pm End Time: 12:15 Pm

***Start a new sheet every 15 minutes.

North Approach

Right	Thru	Left
Cars: ///////		/ /
Trucks:		

from office just using alley

Pedestrains:

Left		Right
Cars:		Cars:
Trucks:		Trucks:
Thru		Thru
Cars:		Cars:
Trucks:		Trucks:
Right		Left
Cars:		Cars:
Trucks:		Trucks:

Peds: (West Approach)

Peds: (East Approach)

South Approach

Left	Thru	Right
Cars:		
Trucks:		

Pedestrains:

(7)

SS Office alley example

Manual Intersection Counts

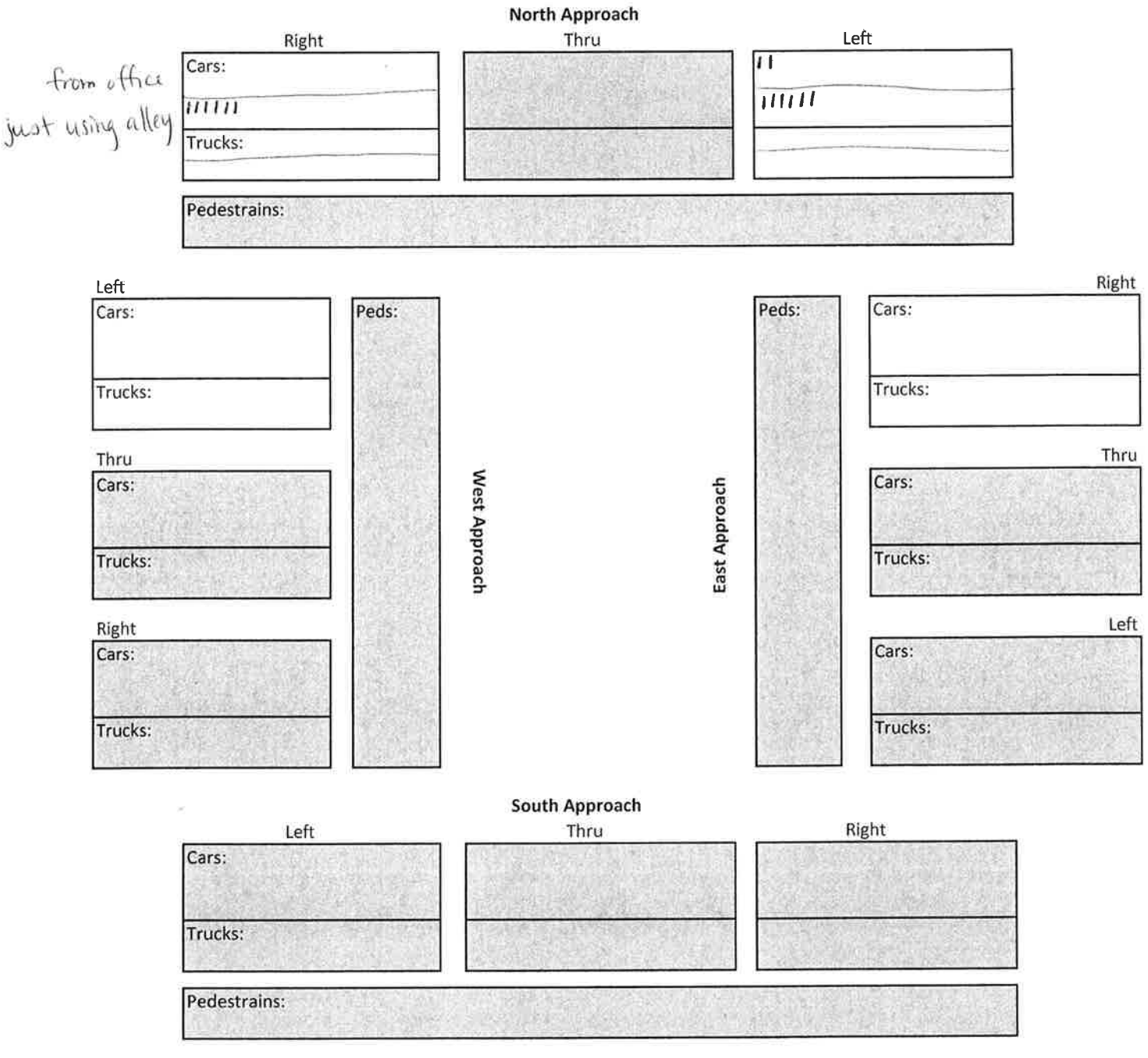
Intersection: Social Security Alley at 4th St.

Date: 4-19-12

Name: Brian Yerardi

Begin Time: 12:15 End Time: 12:30

***Start a new sheet every 15 minutes.



(8)

SS office alley example

Manual Intersection Counts

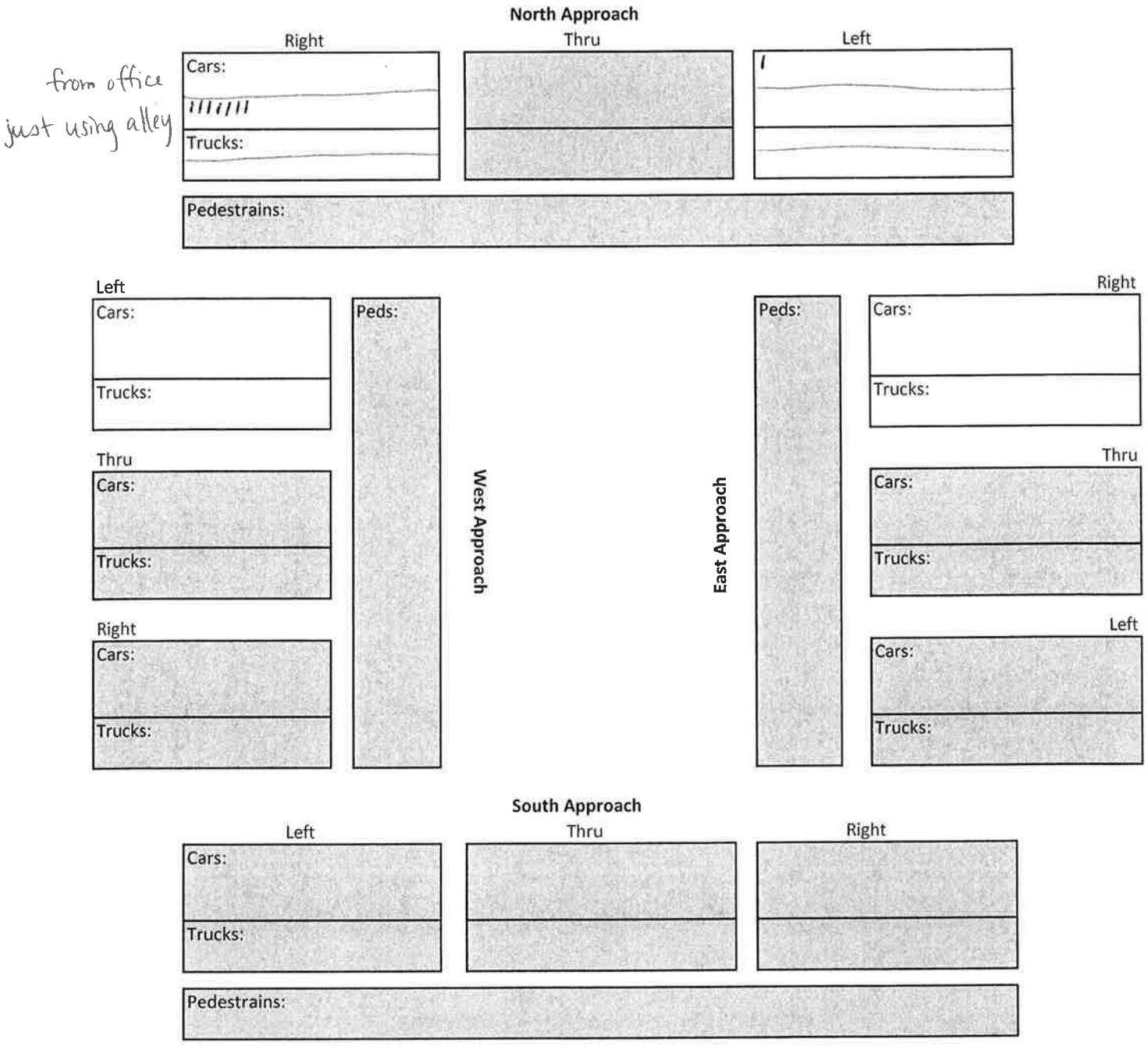
Intersection: Social Security Alley at 4th St.

Date: 4-19-12

Name: Brian Yerardi

Begin Time: 12:30 Pm End Time: 12:45 Pm

***Start a new sheet every 15 minutes.



SSU Count Schedule

Date	Person 1	Person 2	Person 3
4/18/2012	Waller St. @ 3rd St.	SS Office entrance @ 4th St.	Union St. just north of 4th St.
4/19/2012	SSU entrance @ 3rd St.	SS Office alley @ 4th St.	Waller St. just north of 4th St.
4/23/2012	Glover St. @ 4th St.	BWC Office entrance @ 4th St.	Glover St. just north of 4th St.
4/24/2012	4th St. @ Gay St.		

Intersection Count; 7:30 - 8:30 AM and 4:30 - 5:30 PM
Office Count; 9:00 - 10:00 AM, 11:45 AM - 12:45 PM, and 2:45 - 3:45 PM
Pedestrian Count; 7:15 - 9:00 AM and 2:15 - 3:20 PM

4-18-12 / 4th + Glover Wed. 7:30 - 8:30 + 4:30 - 5:30 + SS Entrance

4-19-12 / 3rd and Waller: 7:30 - 8:30 - 4:30 - 5:30 + SS Alley at 4th

9

SS Office alley example

Manual Intersection Counts

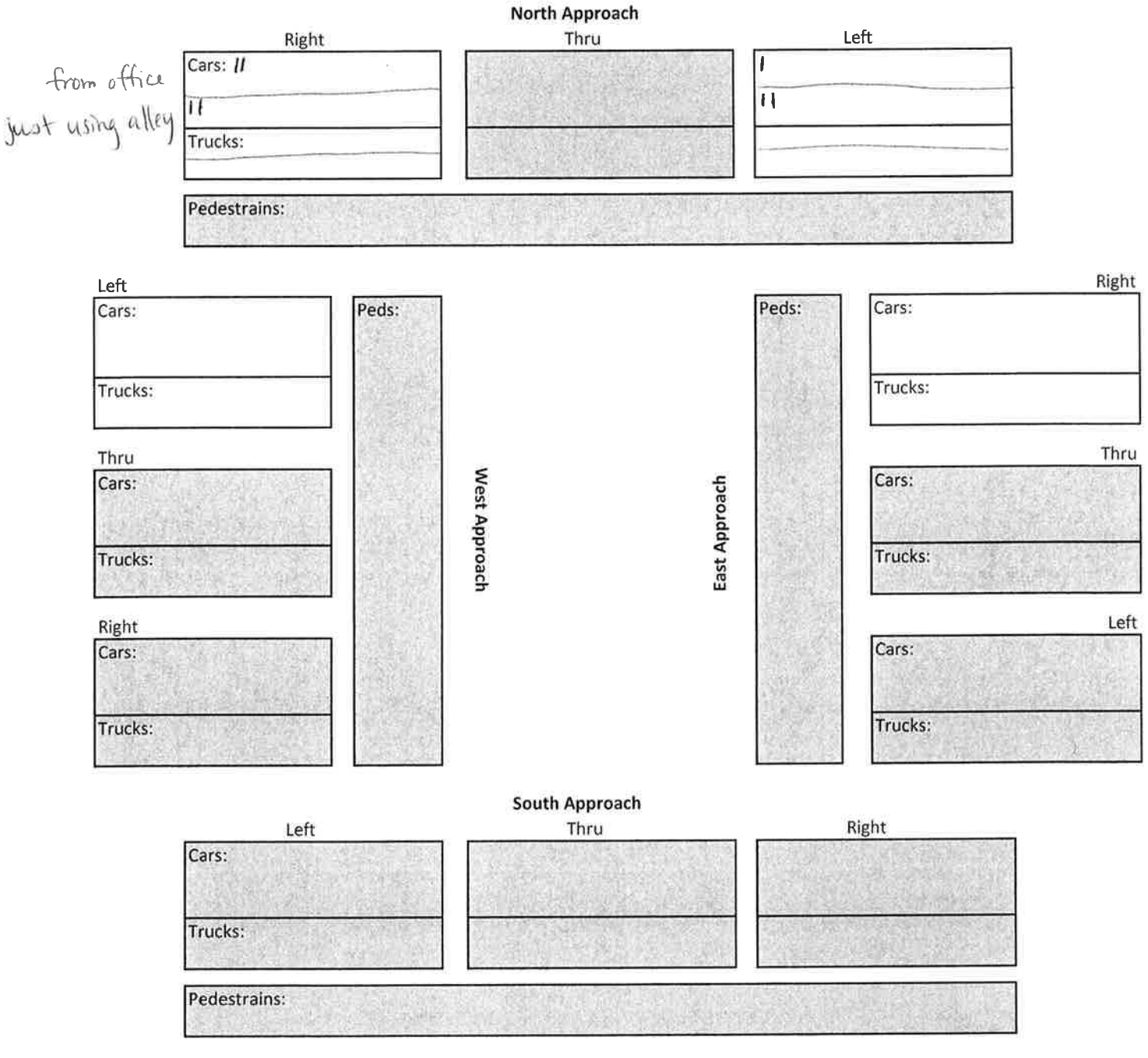
Intersection: Social Security Alley at 4th St.

Date: 4-19-12

Name: Brian Yerardi

Begin Time: 2:45 pm End Time: 3:00 pm

***Start a new sheet every 15 minutes.



10

SS Office alley example

Manual Intersection Counts

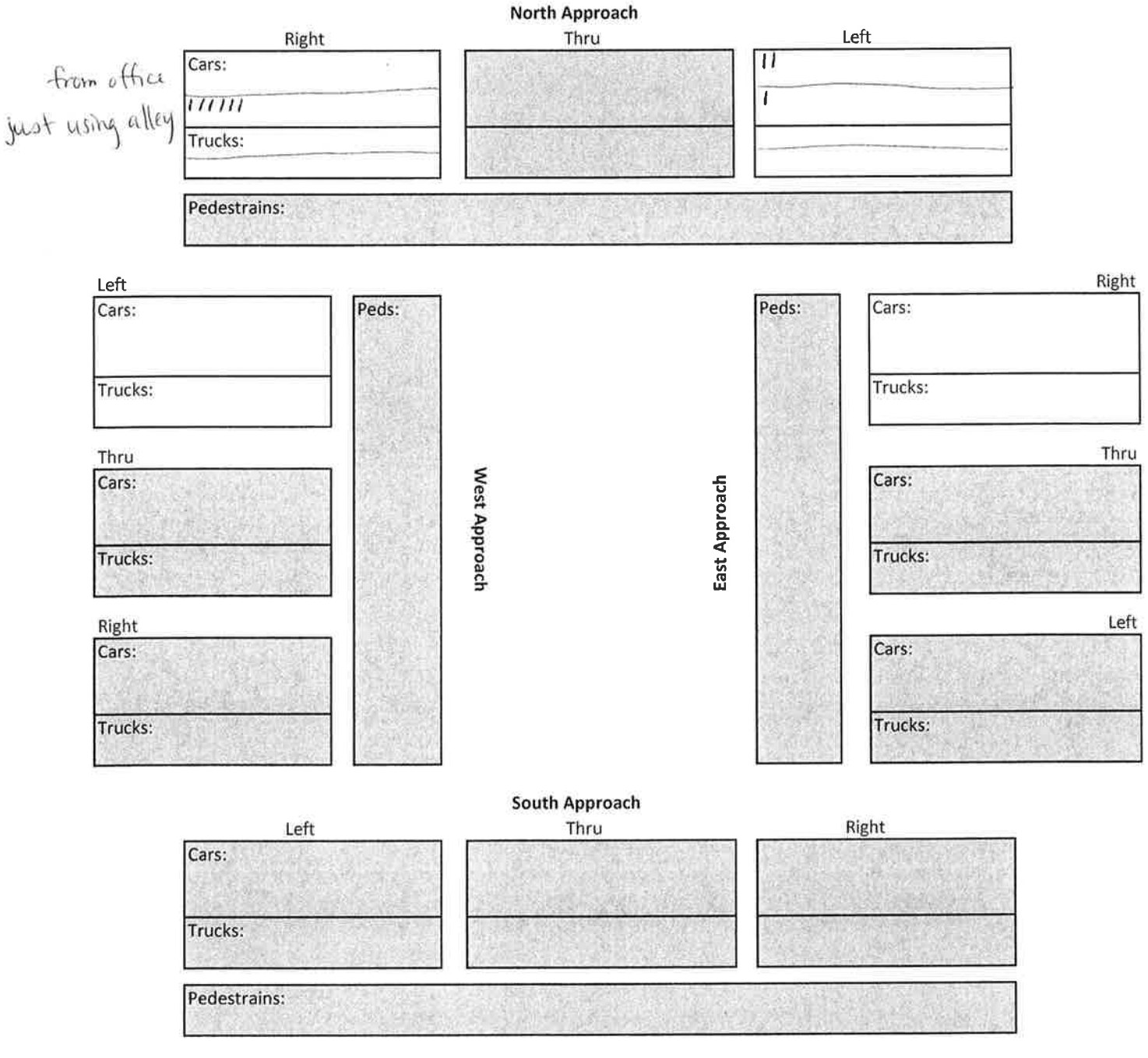
Intersection: Social Security Alley at 4th St.

Date: 4-19-12

Name: Brian Yerardi

Begin Time: 3:00 pm End Time: 3:15 pm

***Start a new sheet every 15 minutes.

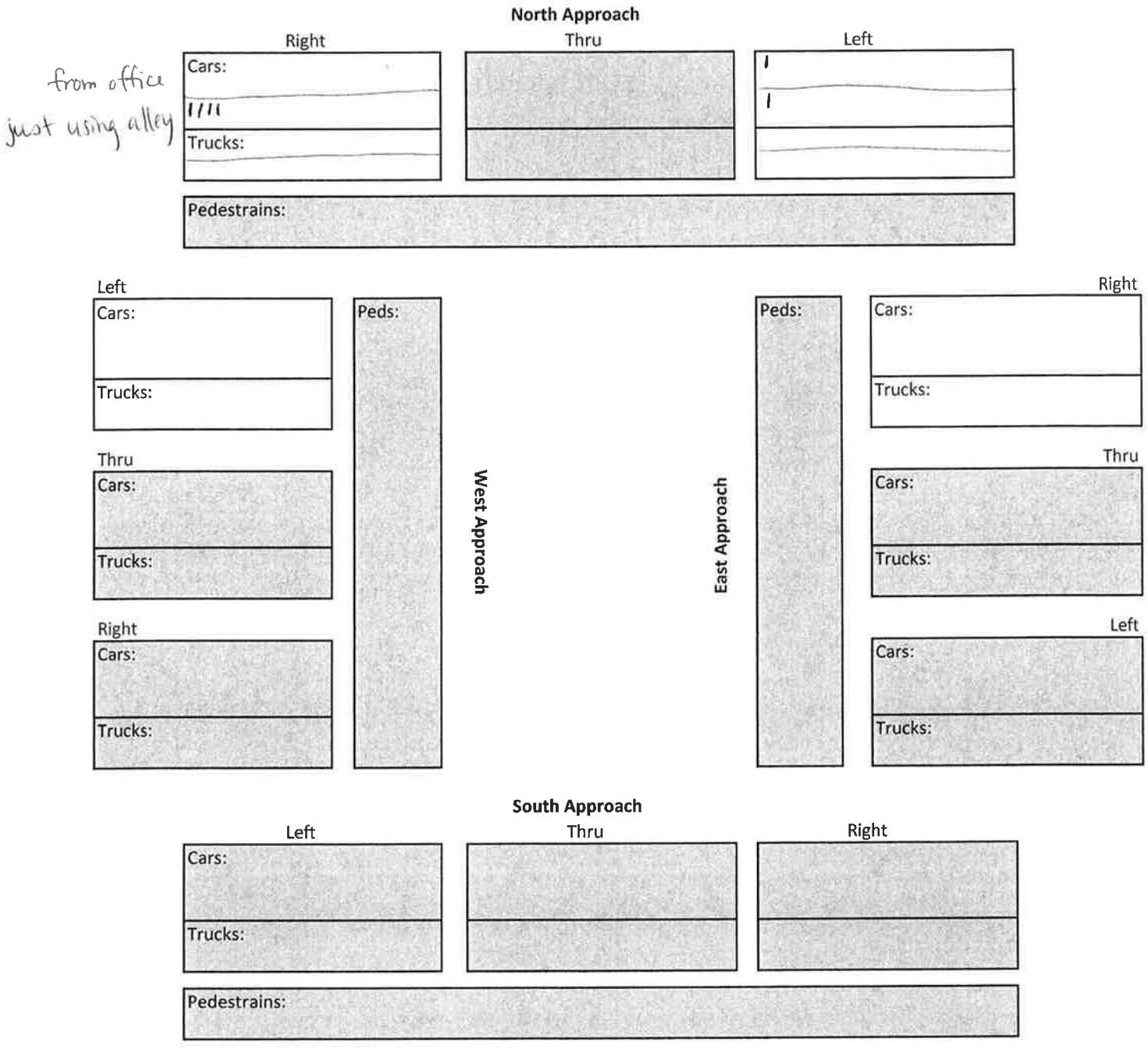


11

SS Office alley example

Manual Intersection Counts

Intersection: Social Security Alley at 4th ST.
Date: 4-19-12
Name: Brian Yerardi
Begin Time: 3:15 pm End Time: 3:30 pm
***Start a new sheet every 15 minutes.

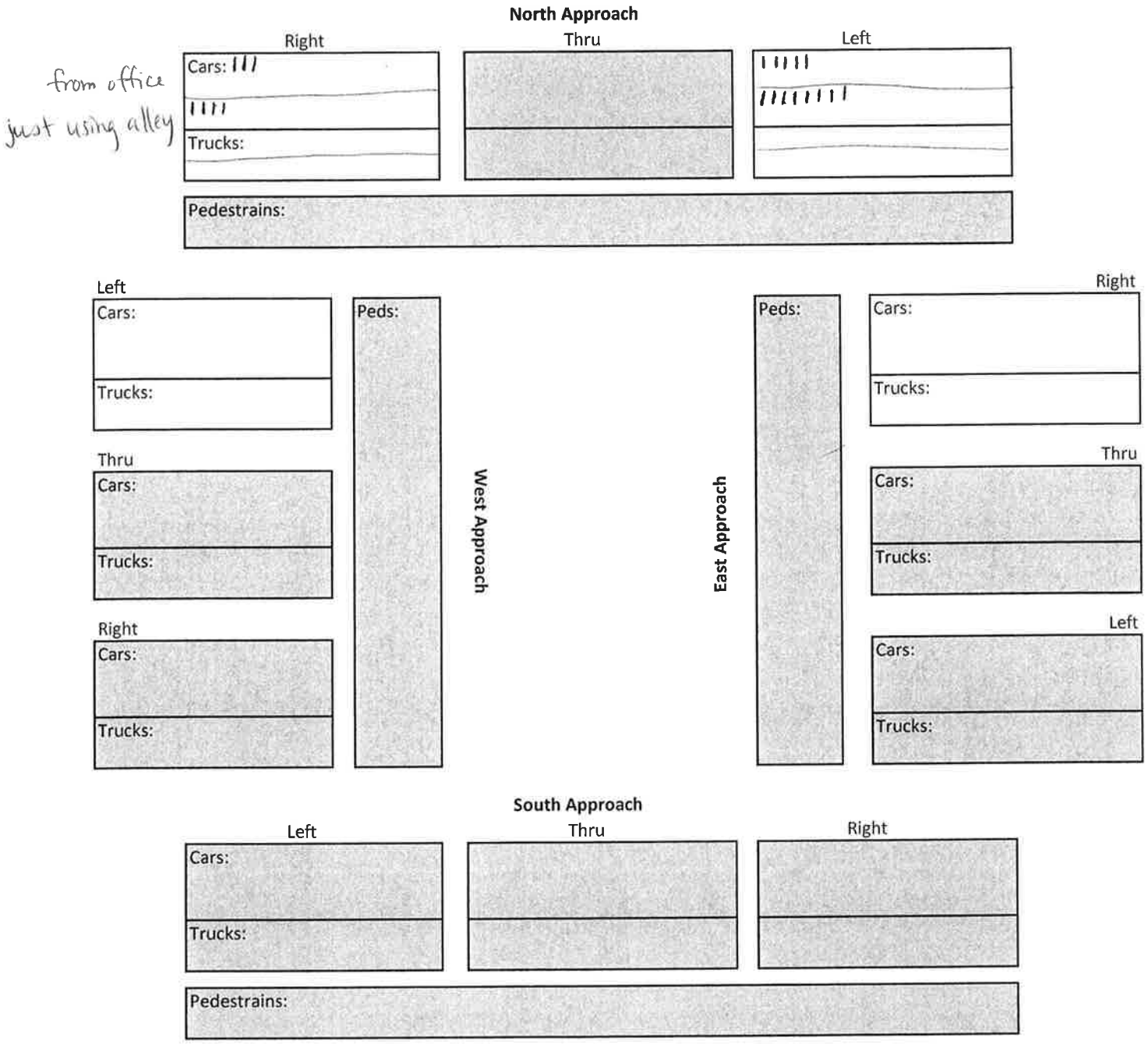


12

SS Office alley example

Manual Intersection Counts

Intersection: Social Security Alley at 4th St.
Date: 4-19-12
Name: Brian Yerardi
Begin Time: 3:30 pm End Time: 3:45 pm
***Start a new sheet every 15 minutes.



(1)

SS Office alley example

Manual Intersection Counts

Intersection: Social Security Entrance 4th ST.

Date: 4-18-12

Name: Brian Yerardi

Begin Time: 9:00 Am End Time: 9:15 Am

***Start a new sheet every 15 minutes.

North Approach

Right	Thru	Left
Cars: I IIII Trucks:		I

from office just using alley

Pedestrains:

West Approach

Left

Cars: I

Trucks:

Peds:

Thru

Cars:

Trucks:

Right

Cars:

Trucks:

East Approach

Peds:

Right

Cars: III

Trucks:

Thru

Cars:

Trucks:

Left

Cars:

Trucks:

South Approach

Left	Thru	Right
Cars: Trucks:		

Pedestrains:

(2)

SS Office alley example

Manual Intersection Counts

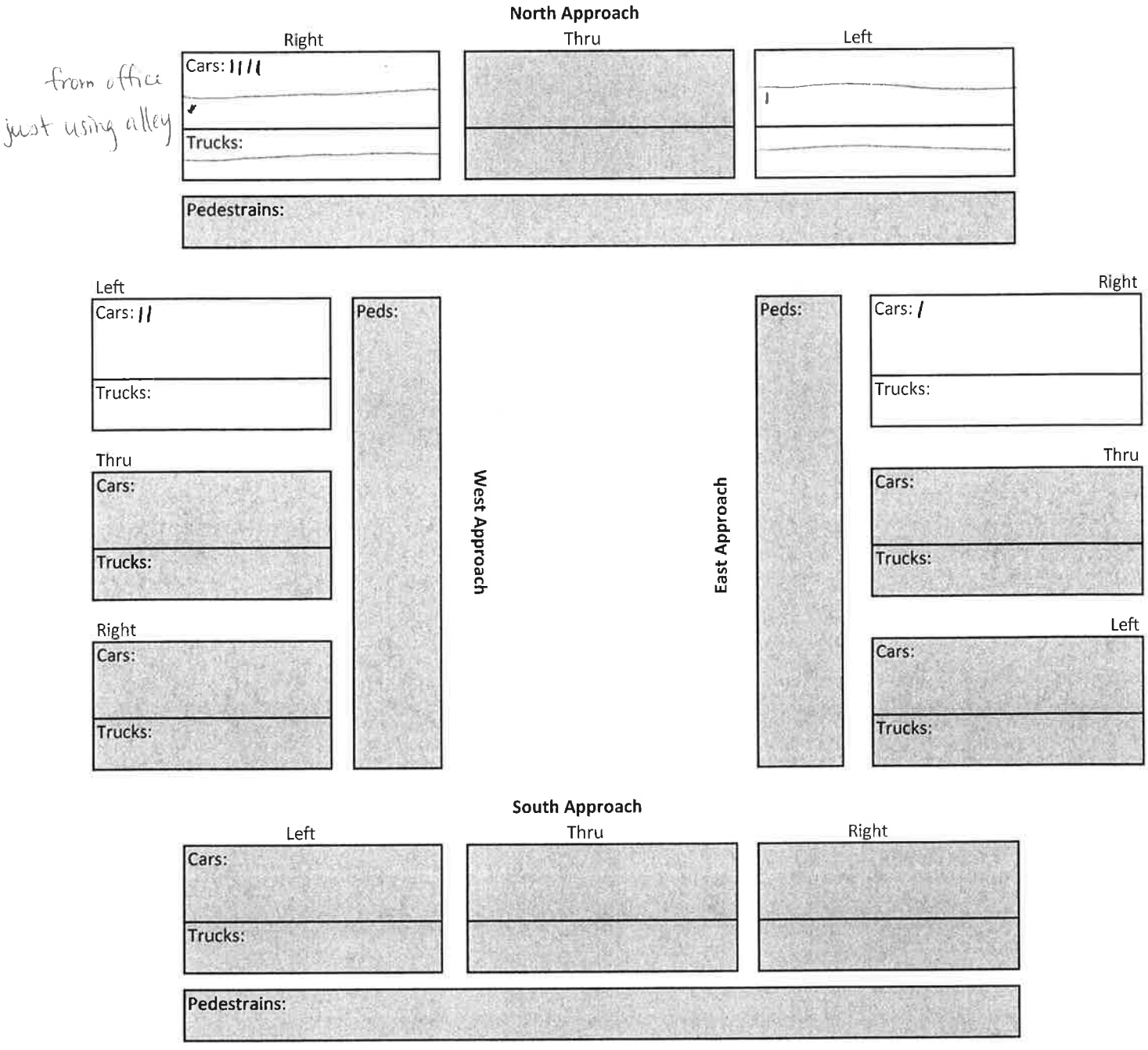
Intersection: Social Security Entrance 4th St.

Date: 4-18-12

Name: Brian Yerardi

Begin Time: 9:15 Am End Time: 9:30 Am

***Start a new sheet every 15 minutes.



(3)

SS Office alley example

Manual Intersection Counts

Intersection: Social Security Entrance 4th St.

Date: 4-18-12

Name: Brian Yerardi

Begin Time: 9:30 Am End Time: 9:45 Am

***Start a new sheet every 15 minutes.

North Approach

from office just using alley

Right	Thru	Left
Cars:		1
Trucks:		

Pedestrains:

Left	Peds:	West Approach	East Approach	Peds:	Right
Cars: 11					Cars:
Trucks:					Trucks:
Thru					Thru
Cars:					Cars:
Trucks:					Trucks:
Right					Left
Cars:					Cars:
Trucks:					Trucks:

South Approach

Left	Thru	Right
Cars:		
Trucks:		

Pedestrains:

(4)

SS Office alley example

Manual Intersection Counts

Intersection: Social Security Entrance 4th St.

Date: 4-18-12

Name: Brian Yerardi

Begin Time: 9:45 Am End Time: 10:00 Am

***Start a new sheet every 15 minutes.

North Approach

Right	Thru	Left
Cars: III		
Trucks:		

from office just using alley

Pedestrains:

Left	Peds:	West Approach	East Approach	Peds:	Right
Cars:					Cars: II
Trucks:					Trucks:
Thru					**Thru**
Cars:					Cars:
Trucks:					Trucks:
Right					**Left**
Cars:					Cars:
Trucks:					Trucks:

South Approach

Left	Thru	Right
Cars:		
Trucks:		

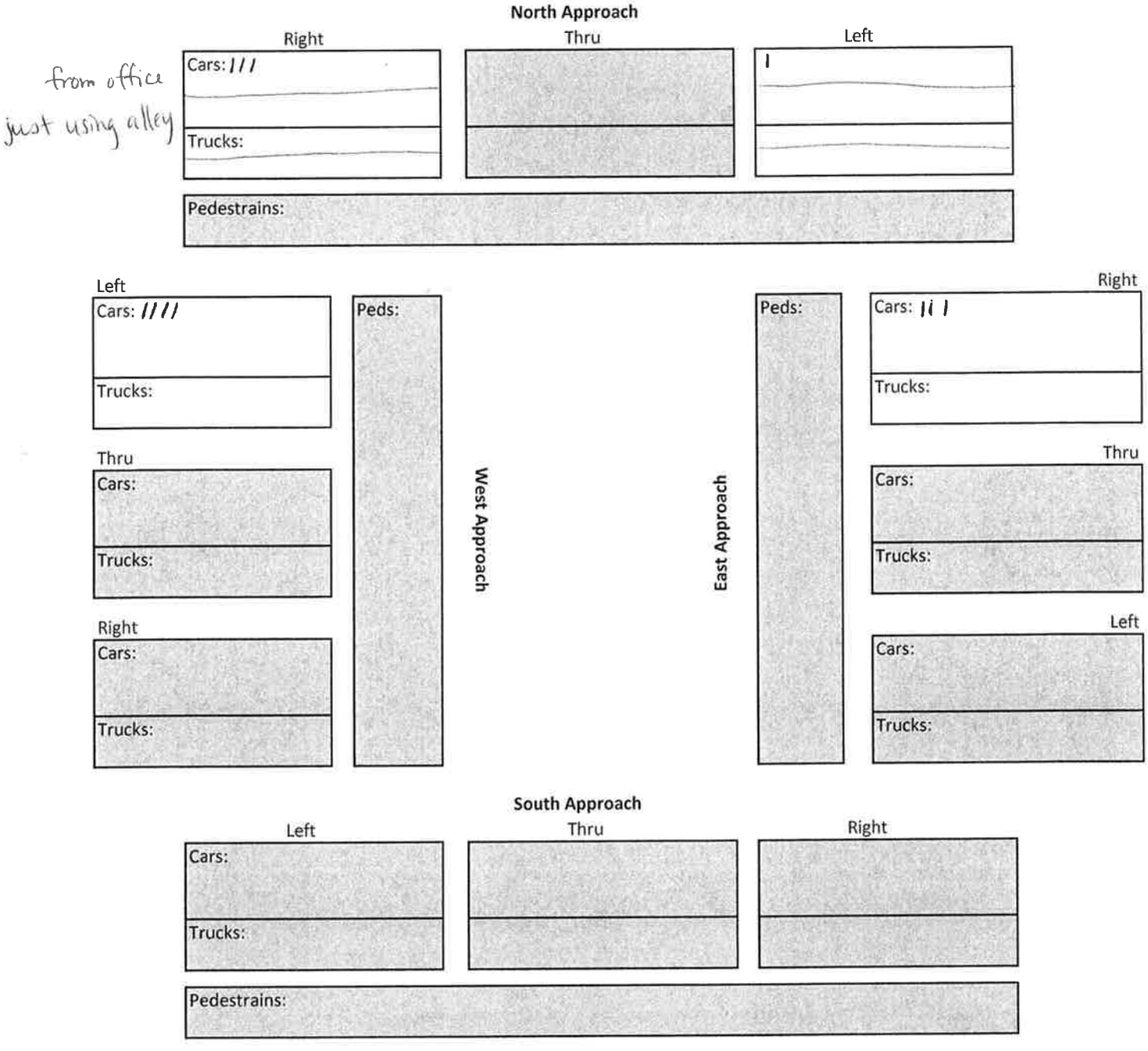
Pedestrains:

(5)

SS office alley example

Manual Intersection Counts

Intersection: Social Security Entrance 4th. St.
Date: 4-18-12
Name: Brian Yerardi
Begin Time: 11:45 Am End Time: 12:00 Pm
***Start a new sheet every 15 minutes.

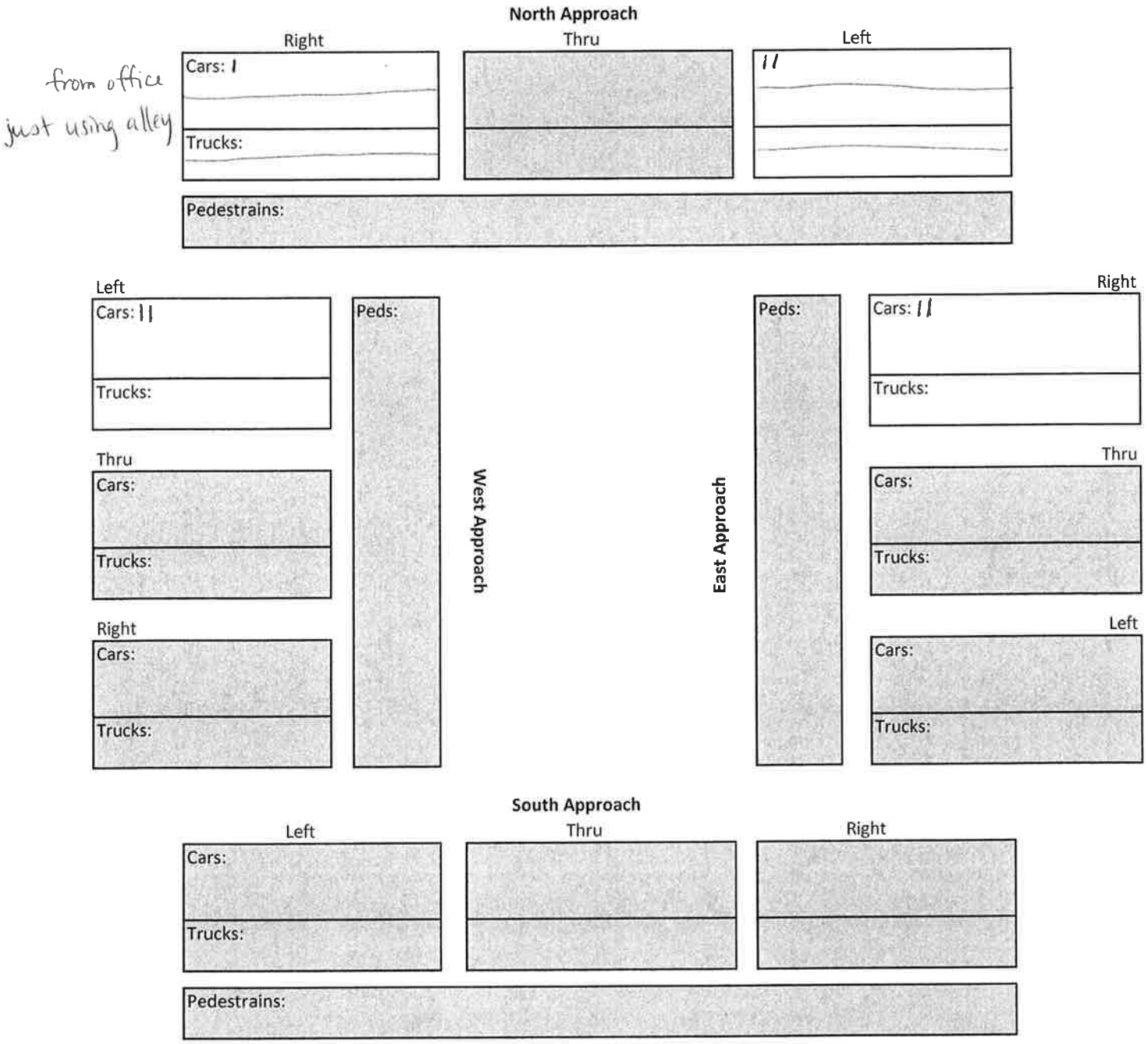


(6)

SS Office alley example

Manual Intersection Counts

Intersection: Social Security Entrance 4th ST.
Date: 4.18.12
Name: Brian Yerardi
Begin Time: 12:00 pm End Time: 1215 pm
***Start a new sheet every 15 minutes.

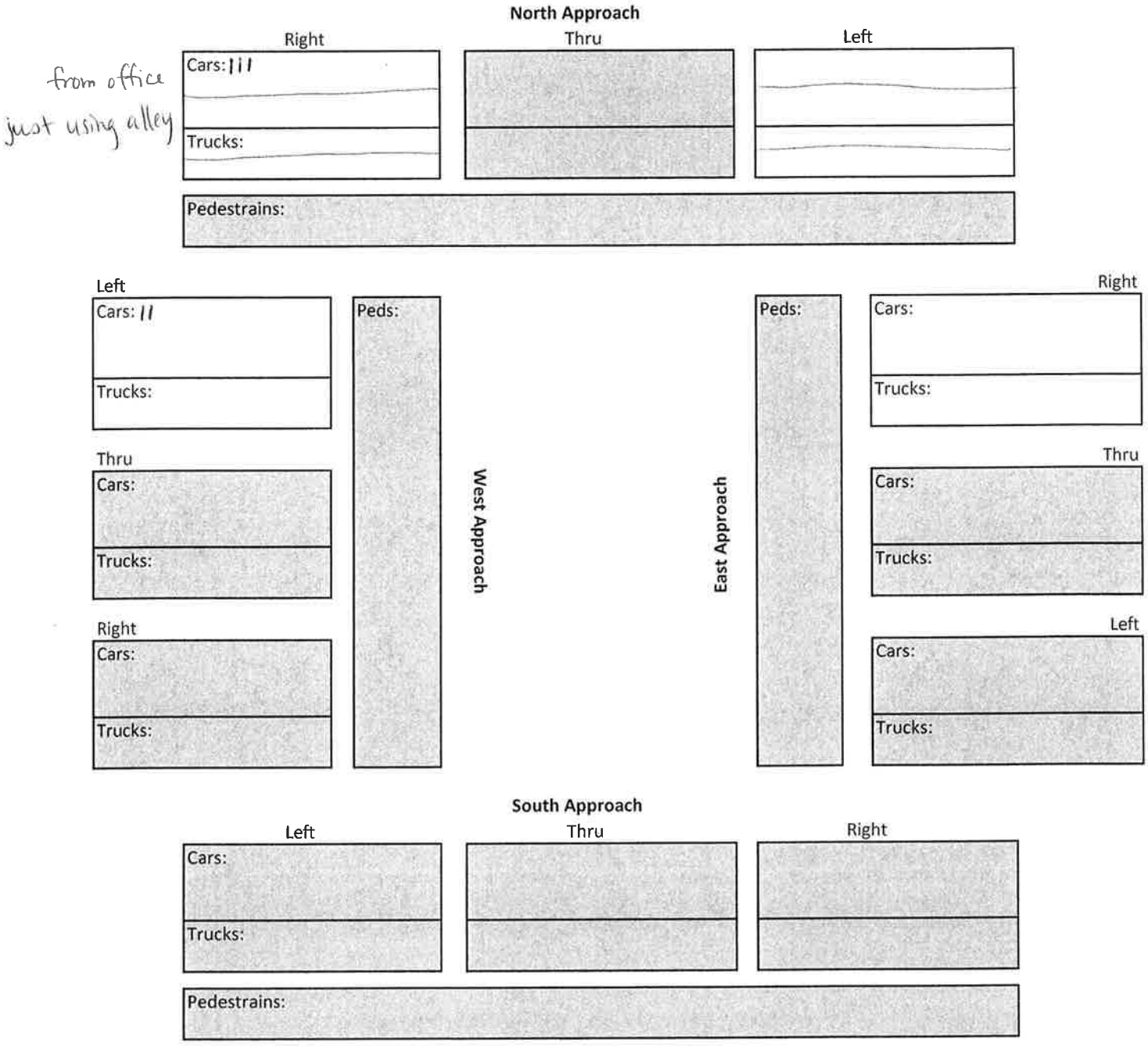


(7)

SS Office alley example

Manual Intersection Counts

Intersection: Social Security Entrance 4th St.
Date: 4-18-12
Name: Brian Yerardi
Begin Time: 12:15 pm End Time: 12:30 pm
***Start a new sheet every 15 minutes.



(8)

SS Office alley example

Manual Intersection Counts

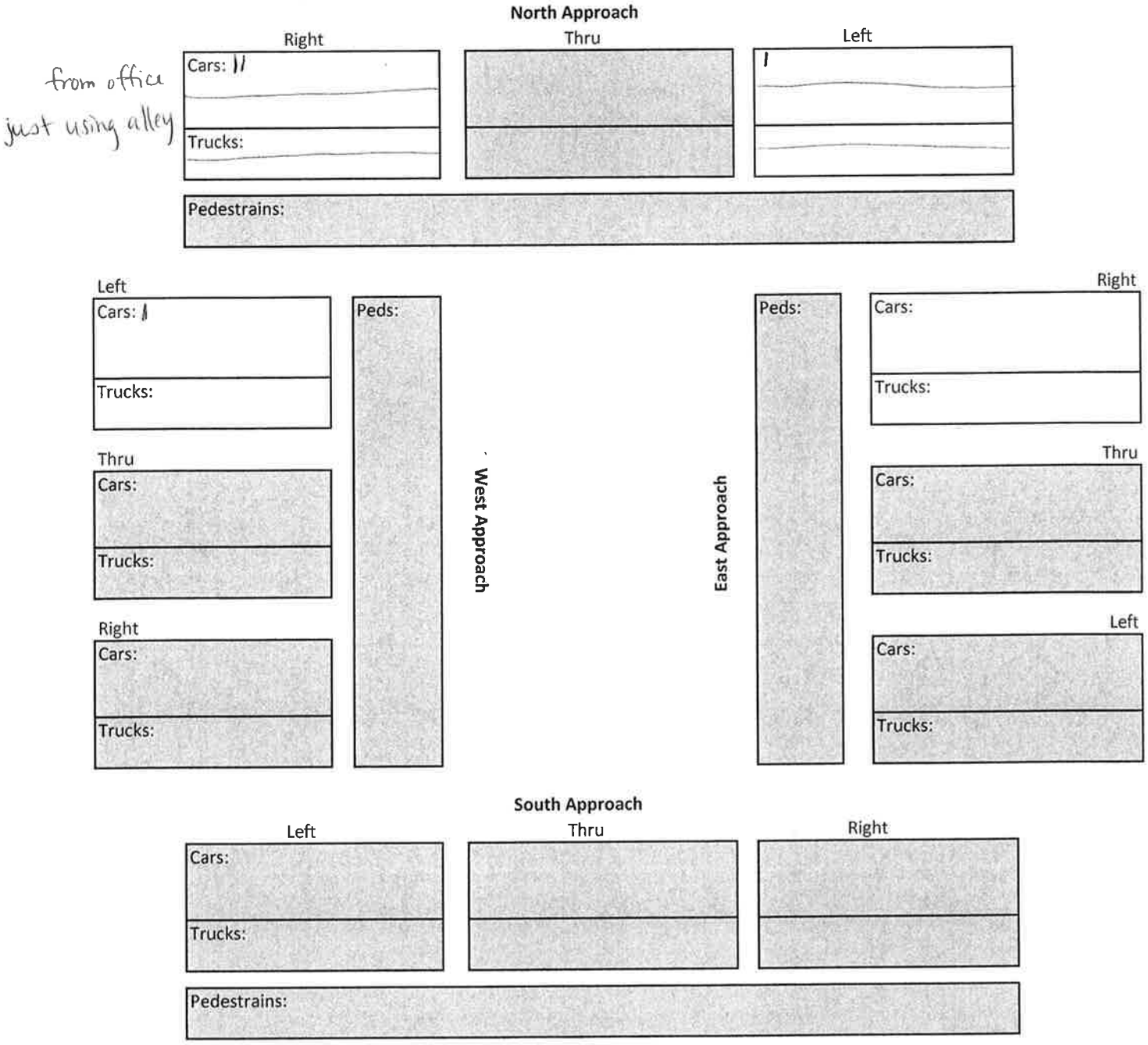
Intersection: Social Security Entrance 4th. ST.

Date: 4-18-12

Name: Brian Yerardi

Begin Time: 12:30 Pm End Time: 12:45 Pm

***Start a new sheet every 15 minutes.



(9)

SS office alley example

Manual Intersection Counts

Intersection: Social Security Entrance 4th. St.
Date: 4-18-12
Name: Brian Yerardi
Begin Time: 2:45 pm End Time: 3:00 pm
***Start a new sheet every 15 minutes.

North Approach

from office just using alley

Right	Thru	Left
Cars: 1		
Trucks:		

Pedestrains:

West Approach

Left
Cars: 1
Trucks:

Thru
Cars:
Trucks:

Right
Cars:
Trucks:

Peds:

East Approach

Peds:

Right
Cars: 1
Trucks:

Thru
Cars:
Trucks:

Left
Cars:
Trucks:

South Approach

Left	Thru	Right
Cars:		
Trucks:		

Pedestrains:

(10)

SS office alley example

Manual Intersection Counts

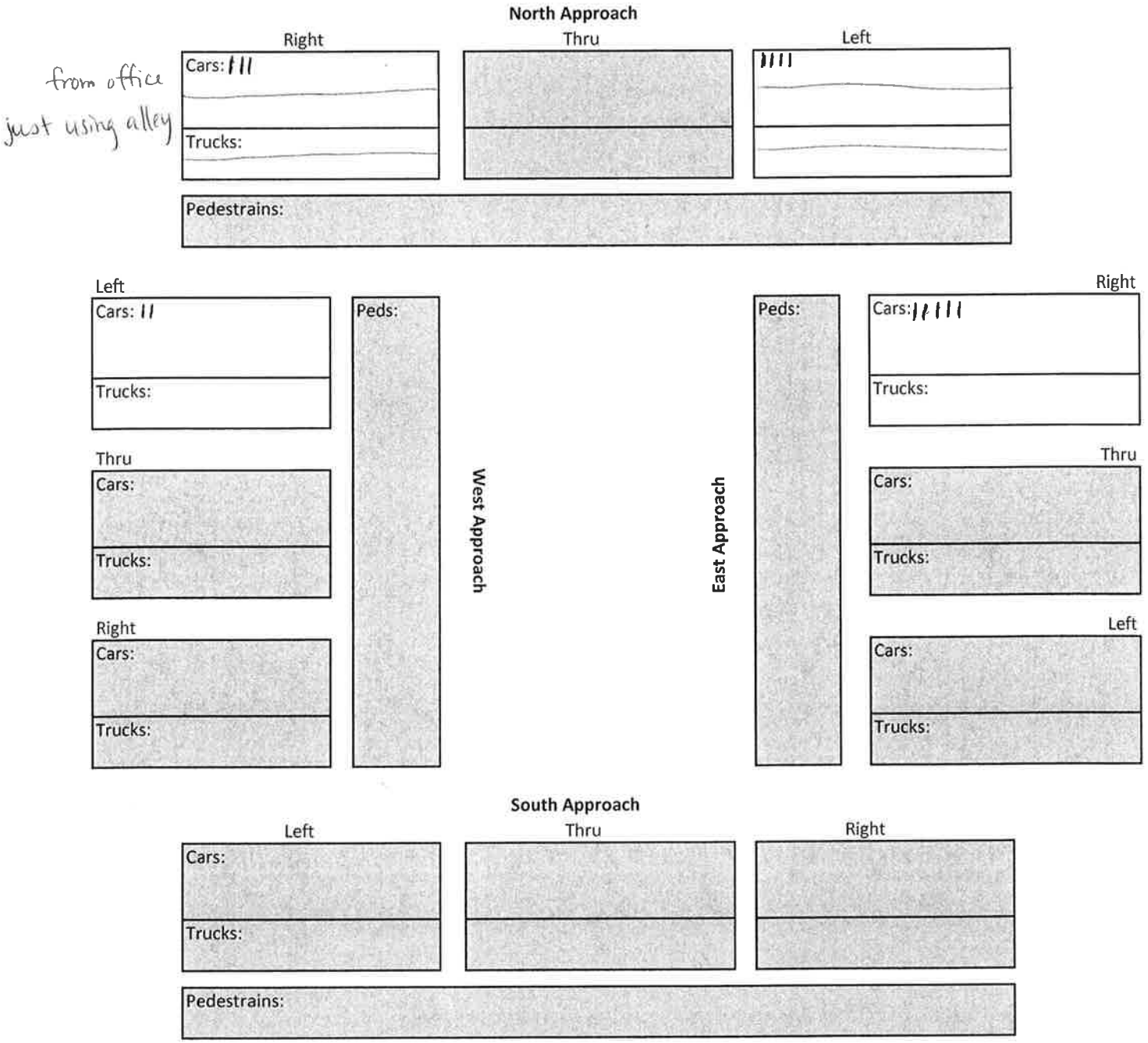
Intersection: Social Security Entrance 4th. St.

Date: 4-18-12

Name: Brian Yerardi

Begin Time: 3:00 pm End Time: 3:15 pm

***Start a new sheet every 15 minutes.



(11)

SS office alley example

Manual Intersection Counts

Intersection: Social Security Entrance 4th. St.
Date: 4-18-12
Name: Brian Yerardi
Begin Time: 3:15 pm End Time: 3:30 pm
***Start a new sheet every 15 minutes.

North Approach

from office just using alley

Right	Thru	Left
Cars: IIIII		
Trucks:		

Pedestrains:

Left	Peds:	West Approach	East Approach	Peds:	Right
Cars:					Cars:
Trucks:					Trucks:
Thru					Thru
Cars:					Cars:
Trucks:					Trucks:
Right					Left
Cars:					Cars:
Trucks:					Trucks:

South Approach

Left	Thru	Right
Cars:		
Trucks:		

Pedestrains:

(12)

SS Office alley example

Manual Intersection Counts

Intersection: Social Security Entrance 4th. St.
Date: 4-18-12
Name: Brian Yerardi
Begin Time: 3:30 pm End Time: 3:45 pm
***Start a new sheet every 15 minutes.

from office just using alley

North Approach

Right	Thru	Left
Cars: /		
Trucks:		

Pedestrains:

West Approach

Left
Cars:
Trucks:

Thru
Cars:
Trucks:

Right
Cars:
Trucks:

Peds:

East Approach

Peds:

Right
Cars:
Trucks:

Thru
Cars:
Trucks:

Left
Cars:
Trucks:

South Approach

Left	Thru	Right
Cars:		
Trucks:		

Pedestrains:

(1)

SS Office alley example

Manual Intersection Counts

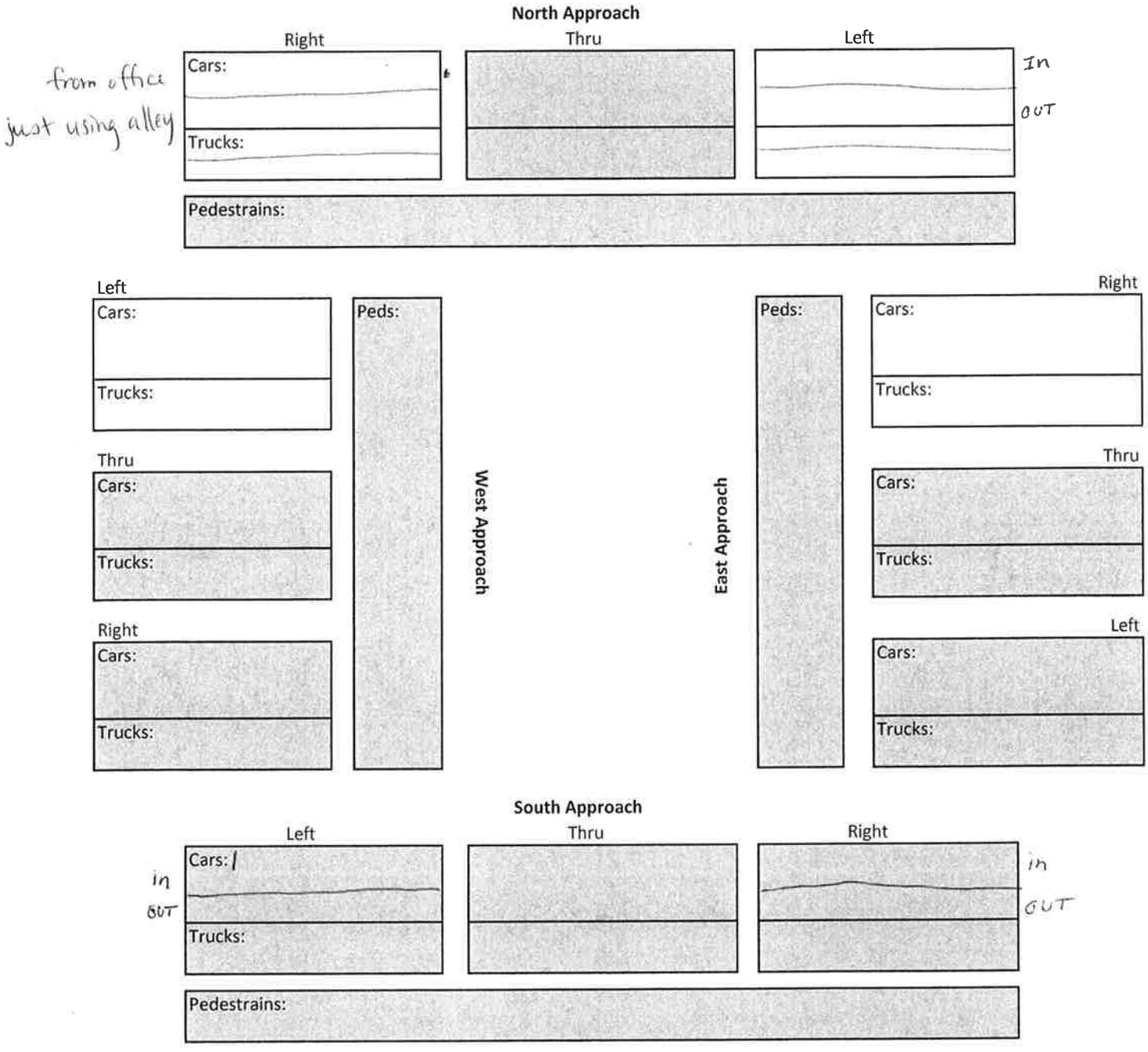
Intersection: BWC Office Entrance at 4th St.

Date: 4-23-12

Name: Brian Yerardi

Begin Time: 9:00 Am End Time: 9:15 Am

***Start a new sheet every 15 minutes.



(2)

SS Office alley example

Manual Intersection Counts

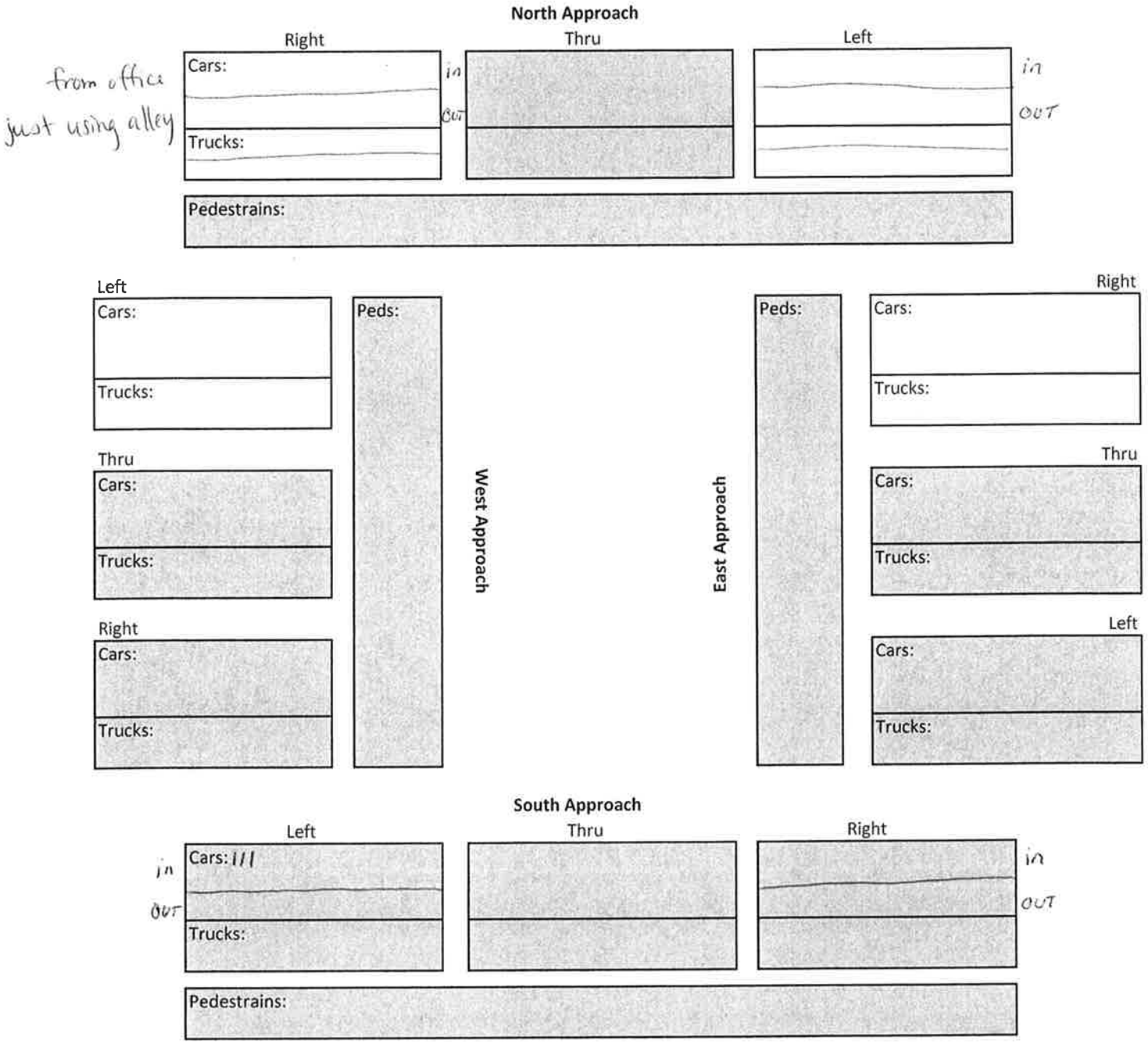
Intersection: BWC Office Entrance at 4th St.

Date: 4-23-12

Name: Brian Yerardi

Begin Time: 9:15 Am End Time: 9:30 Am

***Start a new sheet every 15 minutes.



(3)

SS Office alley example

Manual Intersection Counts

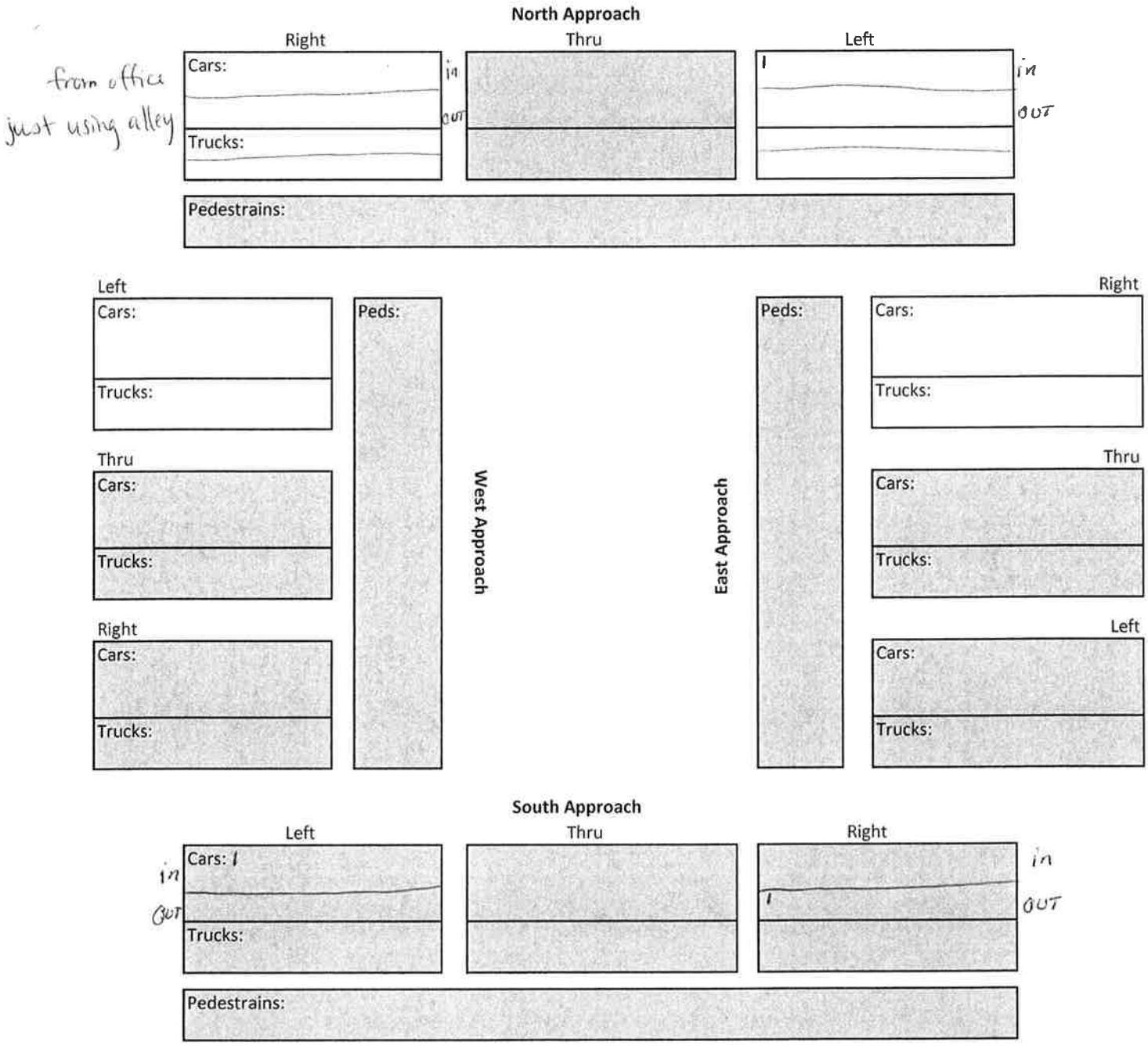
Intersection: BWC Entrance at 4th St.

Date: 4-23-12

Name: Brian Yerardi

Begin Time: 9:30 Am End Time: 9:45 Am.

***Start a new sheet every 15 minutes.



(4)

SS Office alley example

Manual Intersection Counts

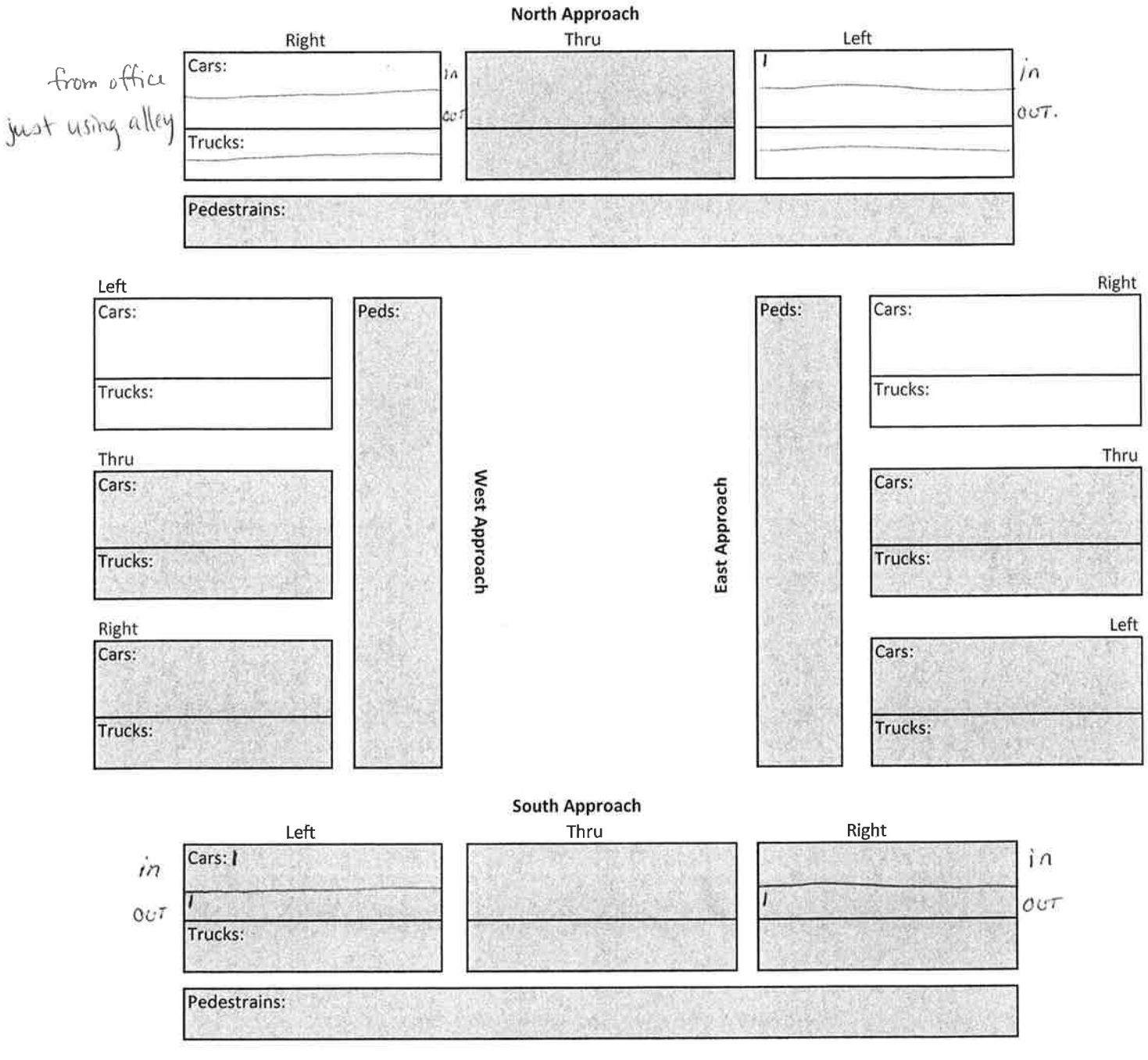
Intersection: BWC Entrance at 4th St.

Date: 4-23-12

Name: Brian Yeracdi

Begin Time: 9:45 Am End Time: 10:00 Am.

***Start a new sheet every 15 minutes.



(5)

SS Office alley example

Manual Intersection Counts

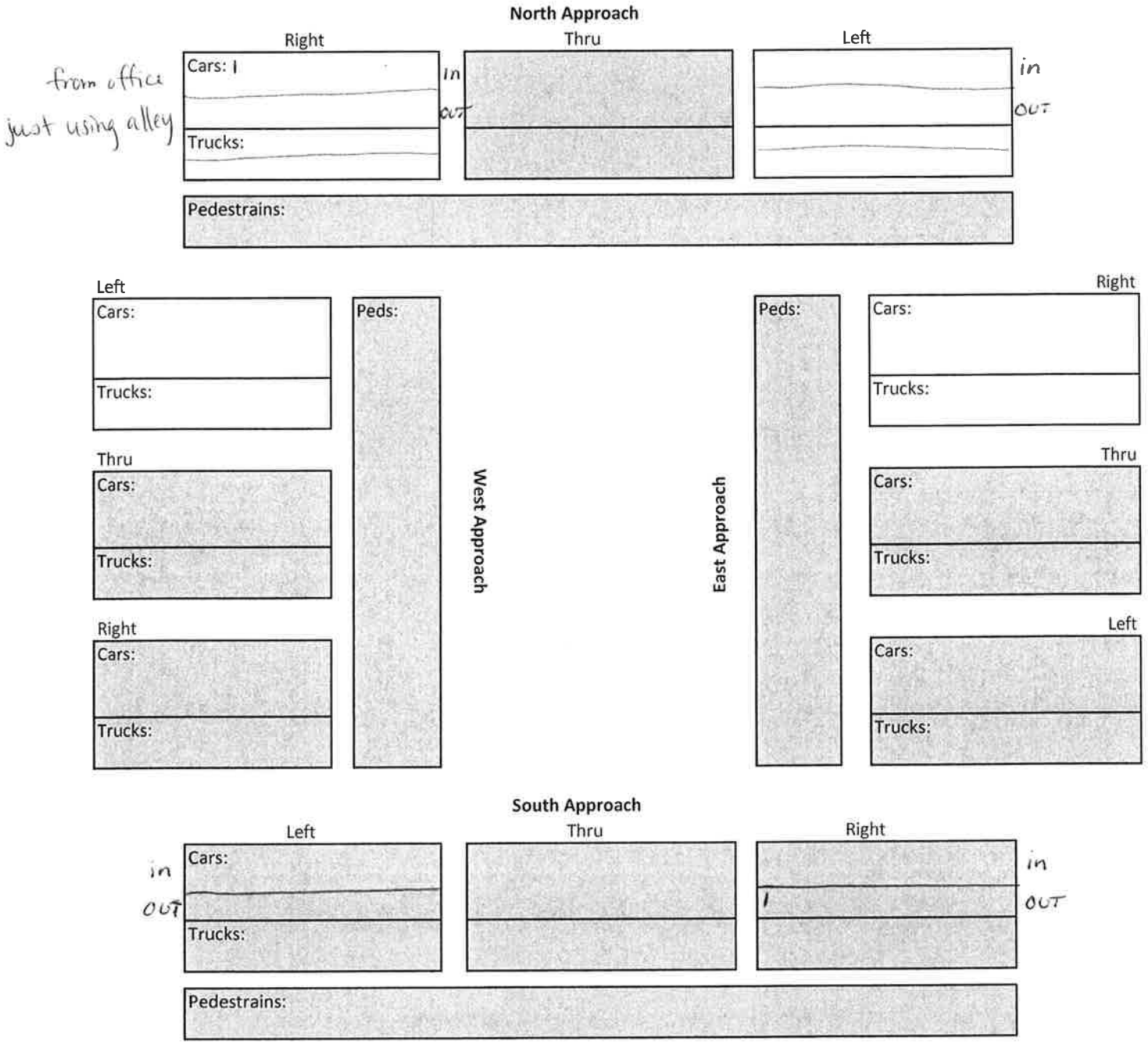
Intersection: BWC Office Entrance at 4th St.

Date: 4-23-12

Name: Brian Yerardi

Begin Time: 11:45 Am End Time: 12:00 Pm.

***Start a new sheet every 15 minutes.



⑥

SS Office alley
example

Manual Intersection Counts

Intersection: BWC Entrance at 4th St.
Date: 4-23-12
Name: Brian Yerardi
Begin Time: 12:00 pm End Time: 12:15 pm
***Start a new sheet every 15 minutes.

North Approach

from office just using alley

Right		Thru	Left	
Cars:	in			in
	out			out
Trucks:				

Pedestrains:

West Approach

Left
Cars:
Trucks:

Thru
Cars:
Trucks:

Right
Cars:
Trucks:

Peds:

East Approach

Peds:

Right
Cars:
Trucks:

Thru
Cars:
Trucks:

Left
Cars:
Trucks:

South Approach

	Left	Thru	Right	
in	Cars:			in
out				out
	Trucks:			

Pedestrains:

(7)

SS Office alley example

Manual Intersection Counts

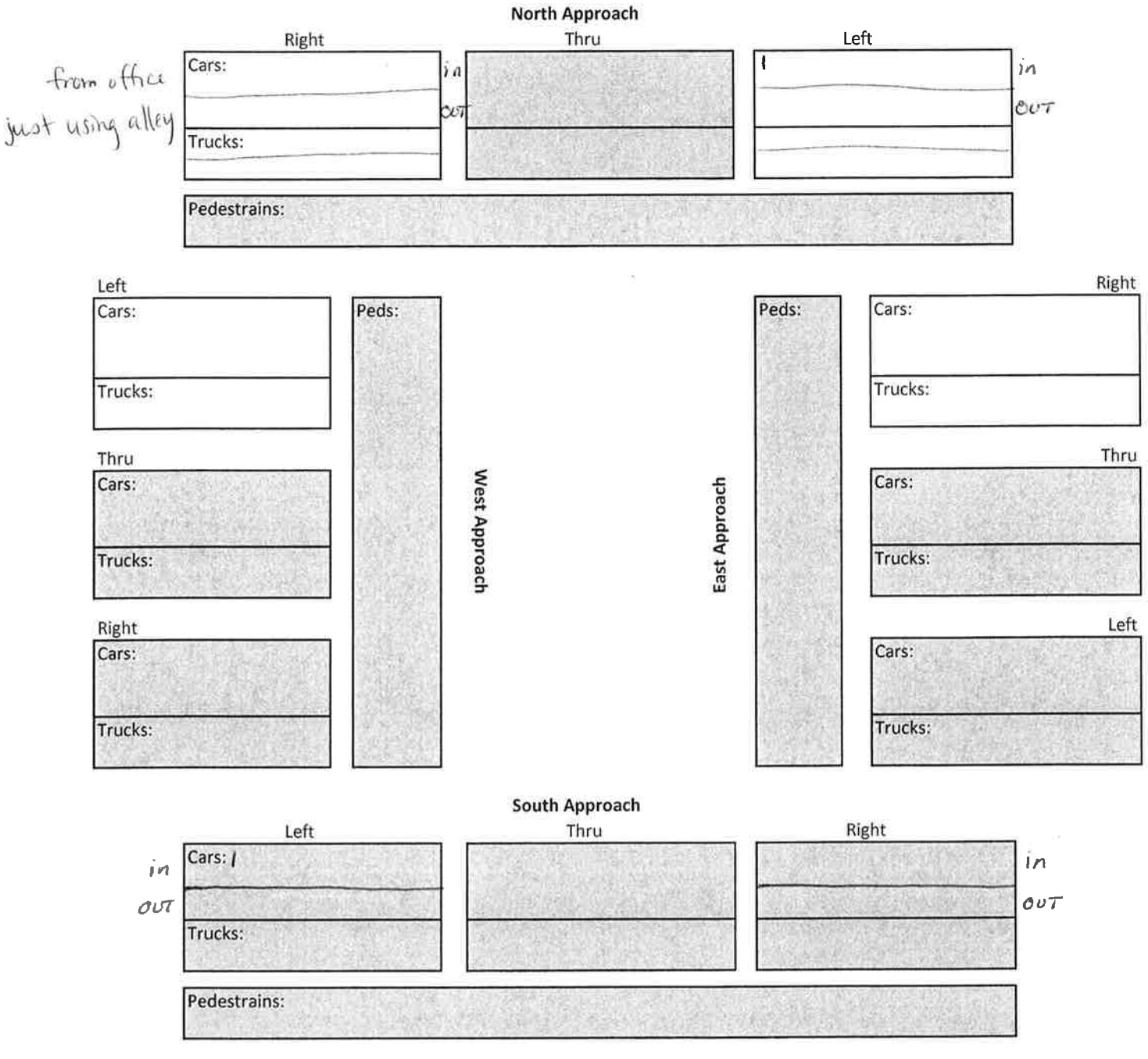
Intersection: BWC Entrance At 4th St.

Date: 4-23-12

Name: Brian Yerardi

Begin Time: 12:15 Pm End Time: 12:30 Pm

***Start a new sheet every 15 minutes.



(8)

SS Office alley example

Manual Intersection Counts

Intersection: BWC Entrance at 4th St.

Date: 4-23-12

Name: Brian Yerardi

Begin Time: 12:30 Pm End Time: 12:45 Pm

***Start a new sheet every 15 minutes.

North Approach

Right	Thru	Left
Cars: (in / out)		(in / out)
Trucks:		

from office just using alley

Pedestrains:

Left	Peds:	West Approach	East Approach	Peds:	Right
Cars:					Cars:
Trucks:					Trucks:
Thru					Thru
Cars:					Cars:
Trucks:					Trucks:
Right					Left
Cars:					Cars:
Trucks:					Trucks:

South Approach

Left	Thru	Right
in / out Cars: 11		1 (in / out)
Trucks:		

Pedestrains:

(9)

SS Office alley example

Manual Intersection Counts

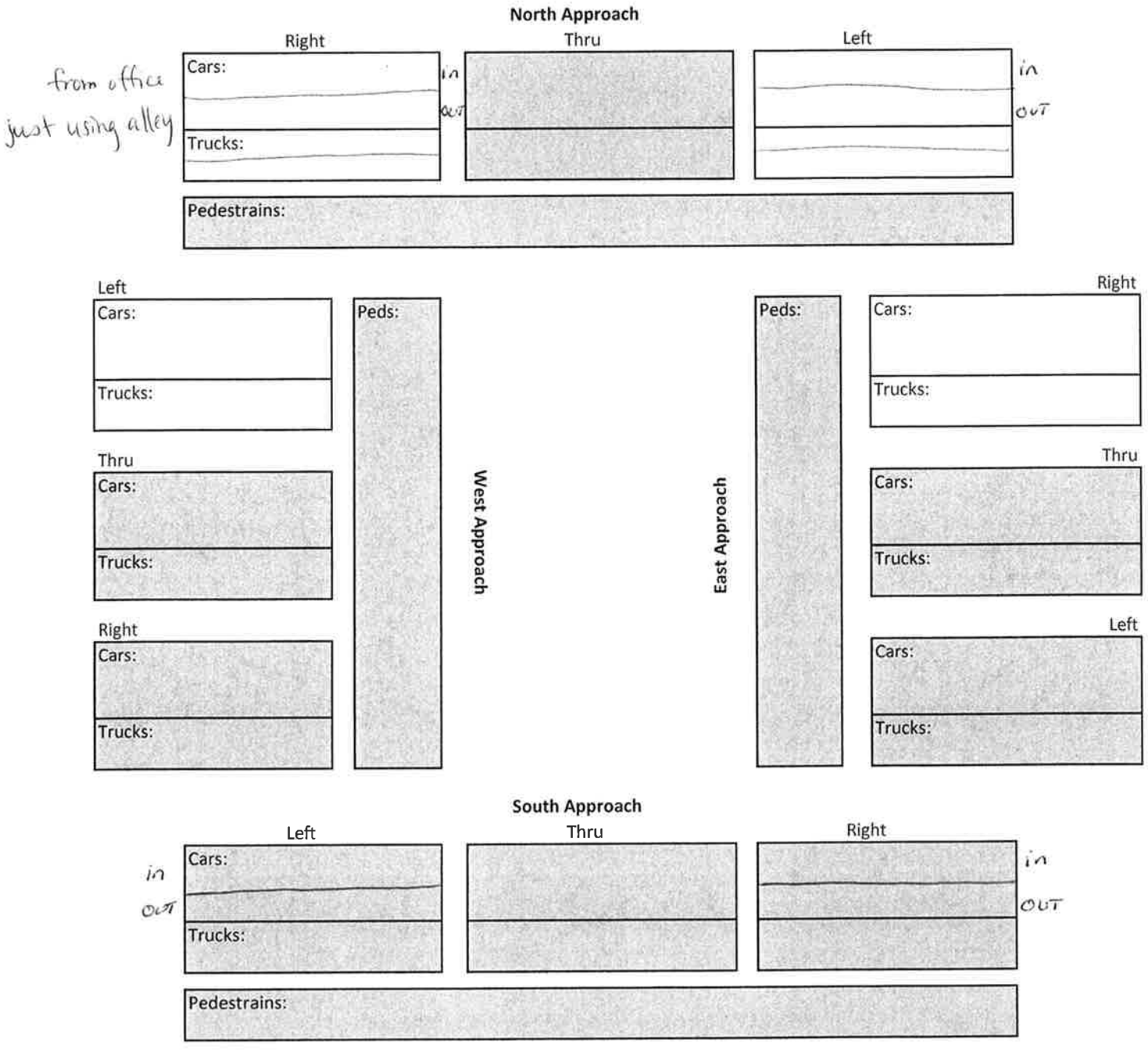
Intersection: BWC Entrance at 4th St.

Date: 4-23-12

Name: Brian Yerardi

Begin Time: 2:45 pm End Time: 3:00 pm

***Start a new sheet every 15 minutes.



(10)

SS Office alley example

Manual Intersection Counts

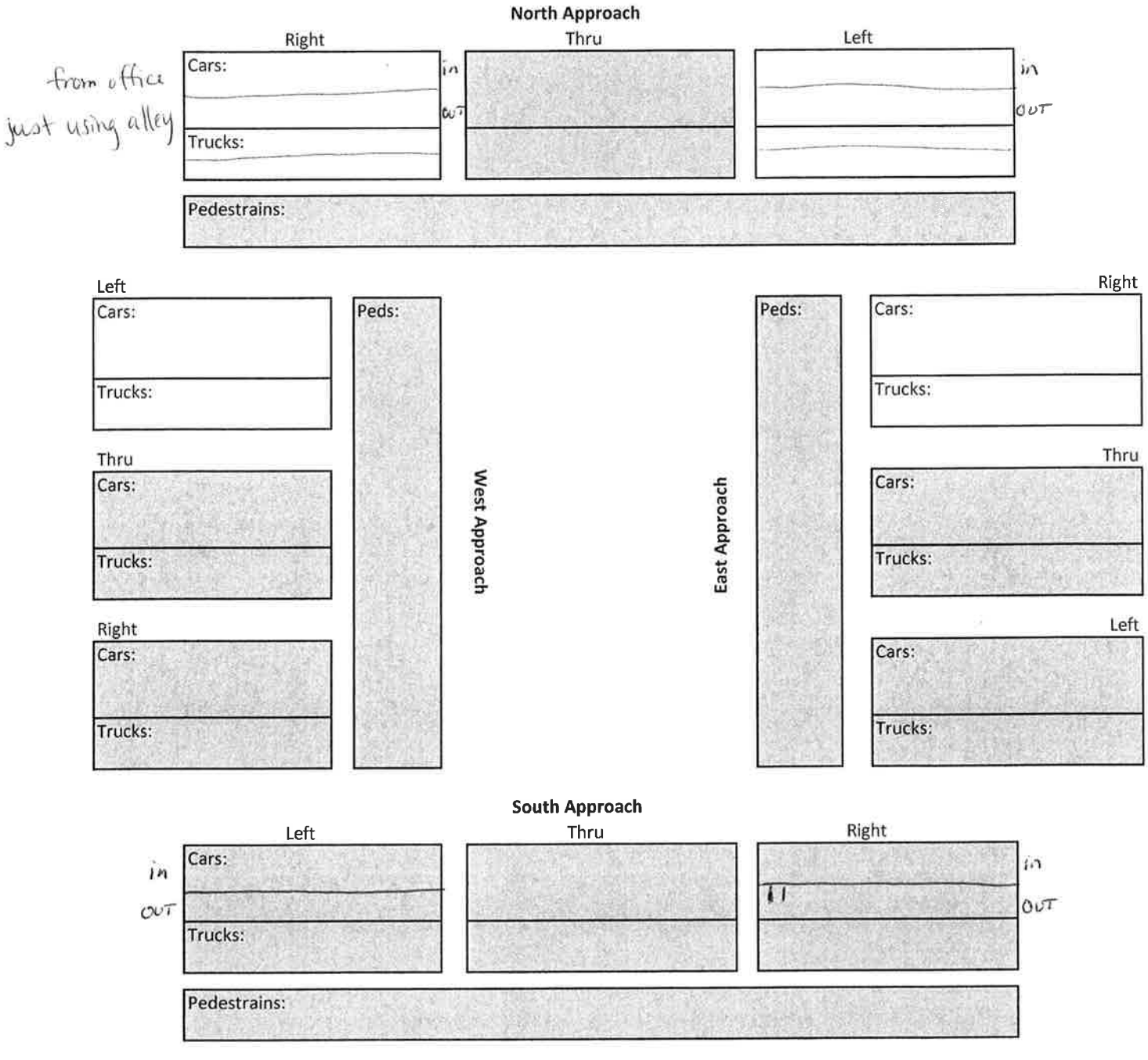
Intersection: BWC Entrance at 4th St.

Date: 4-23-12

Name: Brian Yerardi

Begin Time: 3:00 Pm End Time: 3:15 Pm

***Start a new sheet every 15 minutes.



(11)

SS Office alley example

Manual Intersection Counts

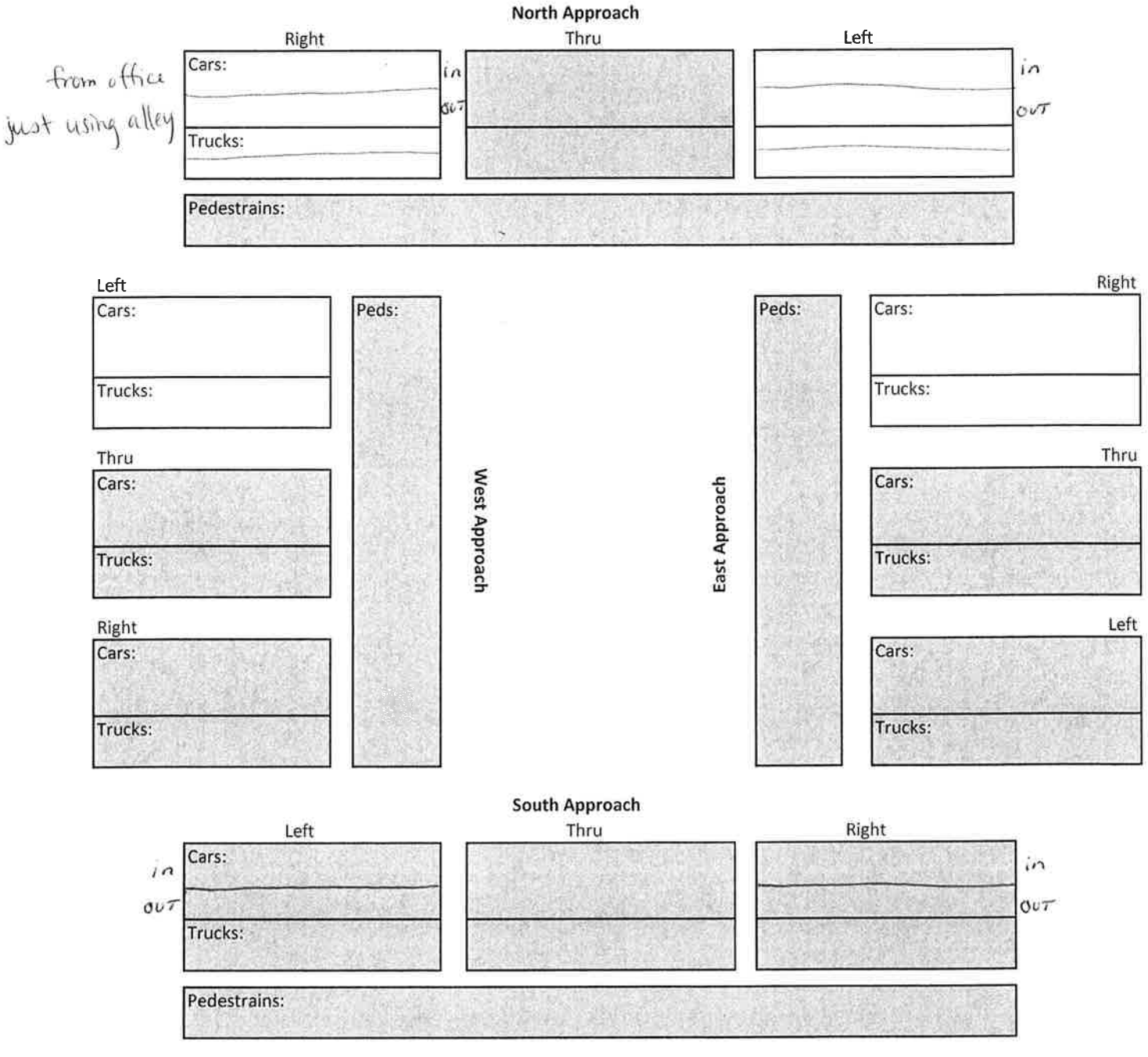
Intersection: BWC Entrance at 4th St.

Date: 4-23-12

Name: Brian Yerardi

Begin Time: 3:15 pm End Time: 3:30 pm

***Start a new sheet every 15 minutes.

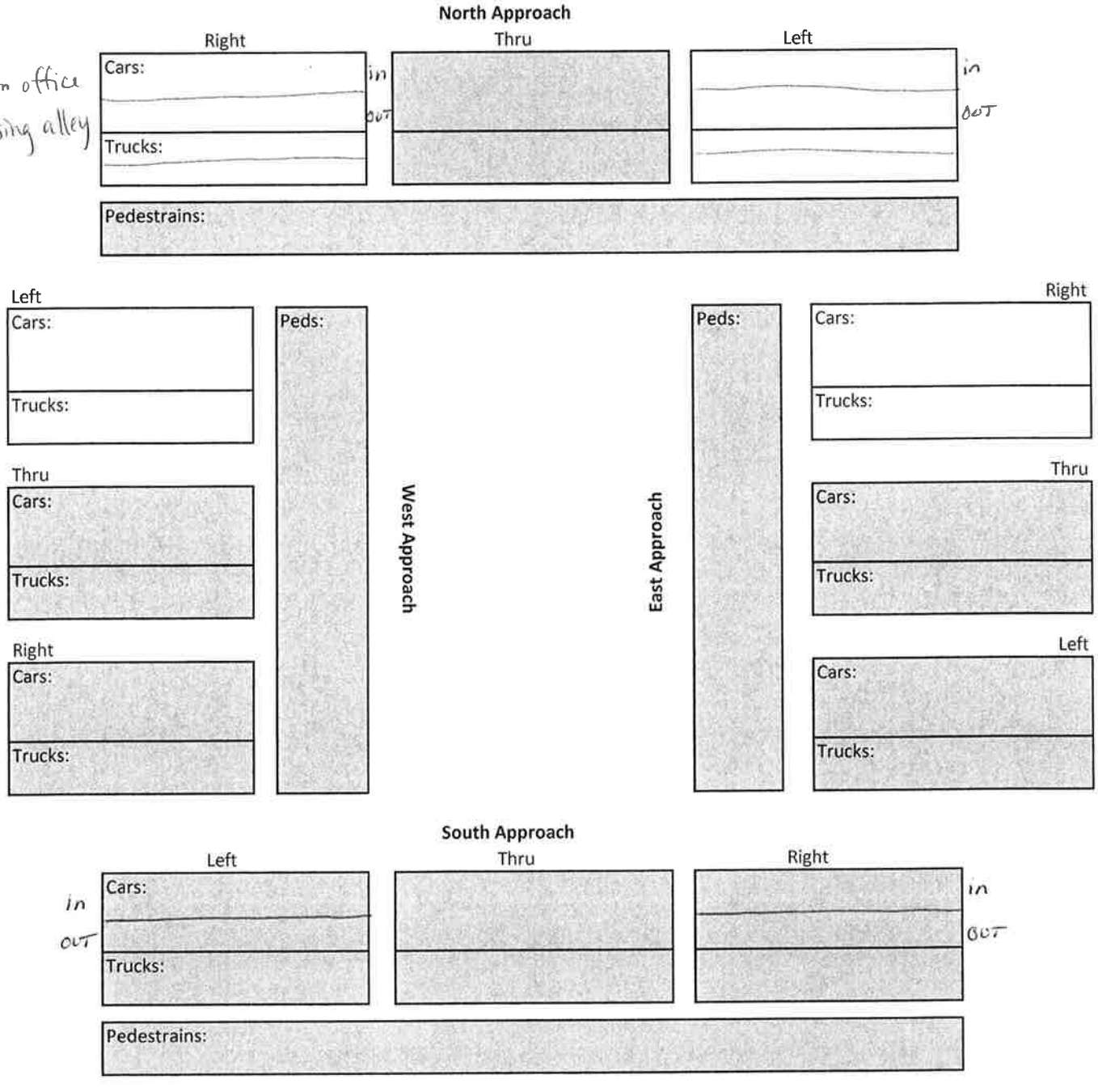


(12)

SS Office alley example

Manual Intersection Counts

Intersection: BWC Entrance at 4th St.
Date: 4-23-12
Name: Brian Yerardi
Begin Time: 3:30 Pm End Time: 3:45 Pm
***Start a new sheet every 15 minutes.



Manual Intersection Counts

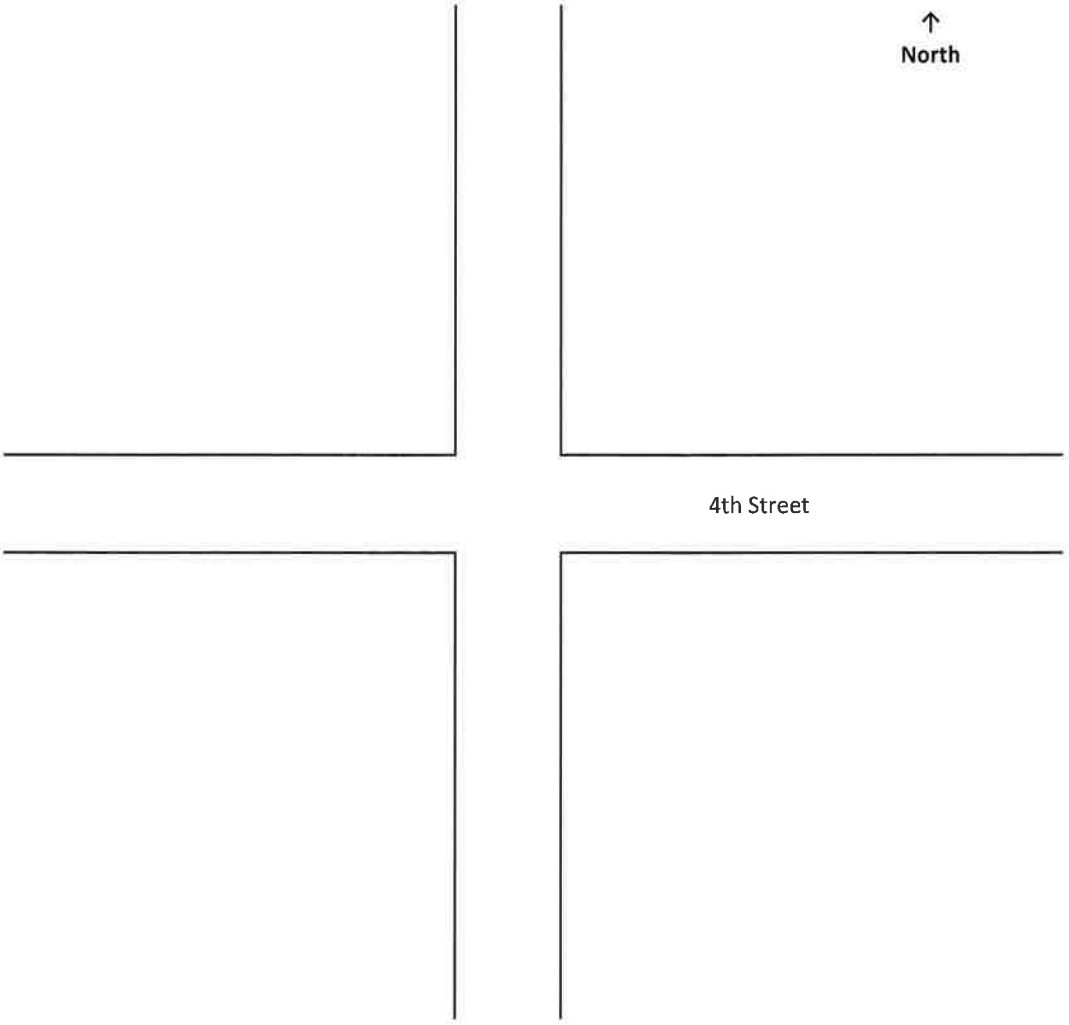
Intersection: 4th + Glover

Date: 4/23/12

Name: B. Cooper

Begin Time: 7:15 am End Time: 7:30 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

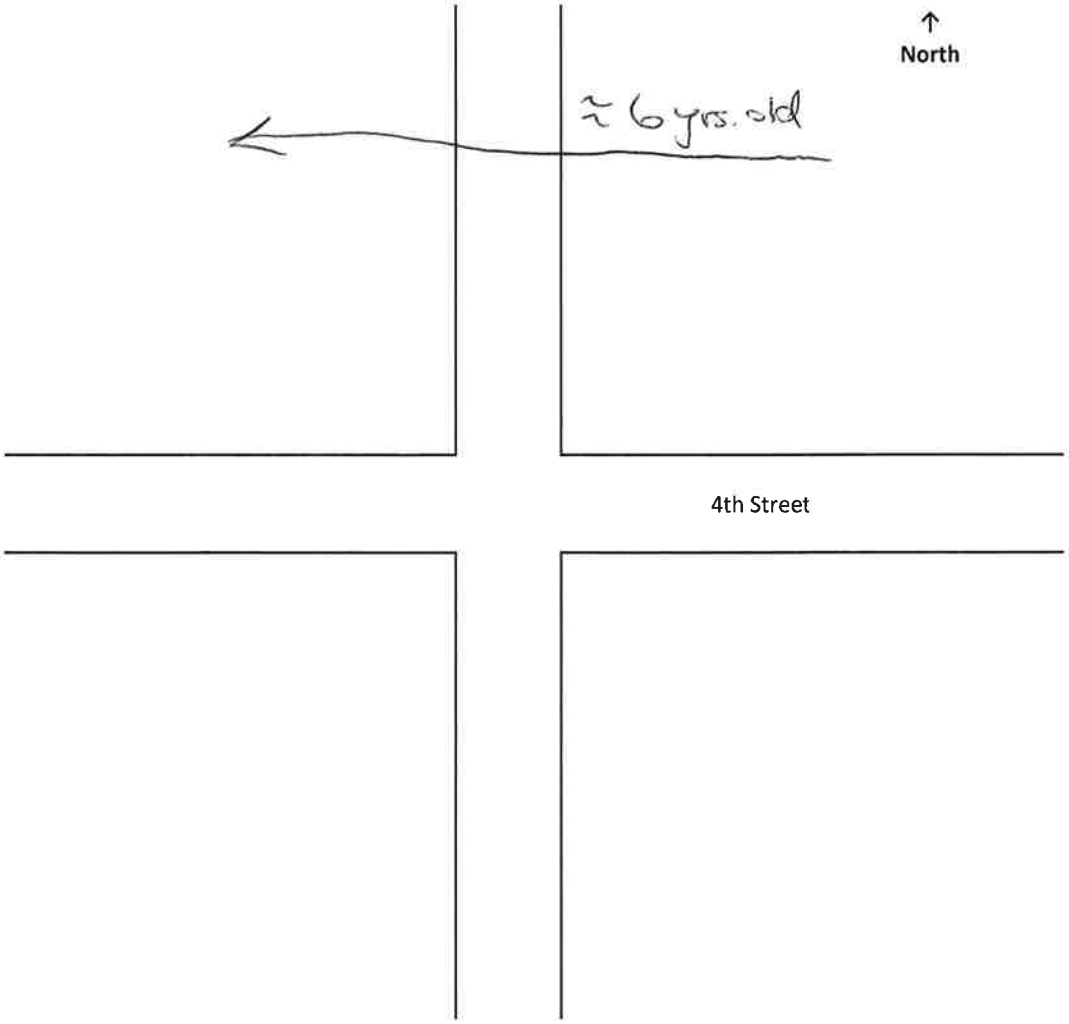
Intersection: 4th + Glover

Date: 4/23/12

Name: B. Cooper

Begin Time: 7:30 am End Time: 7:45 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

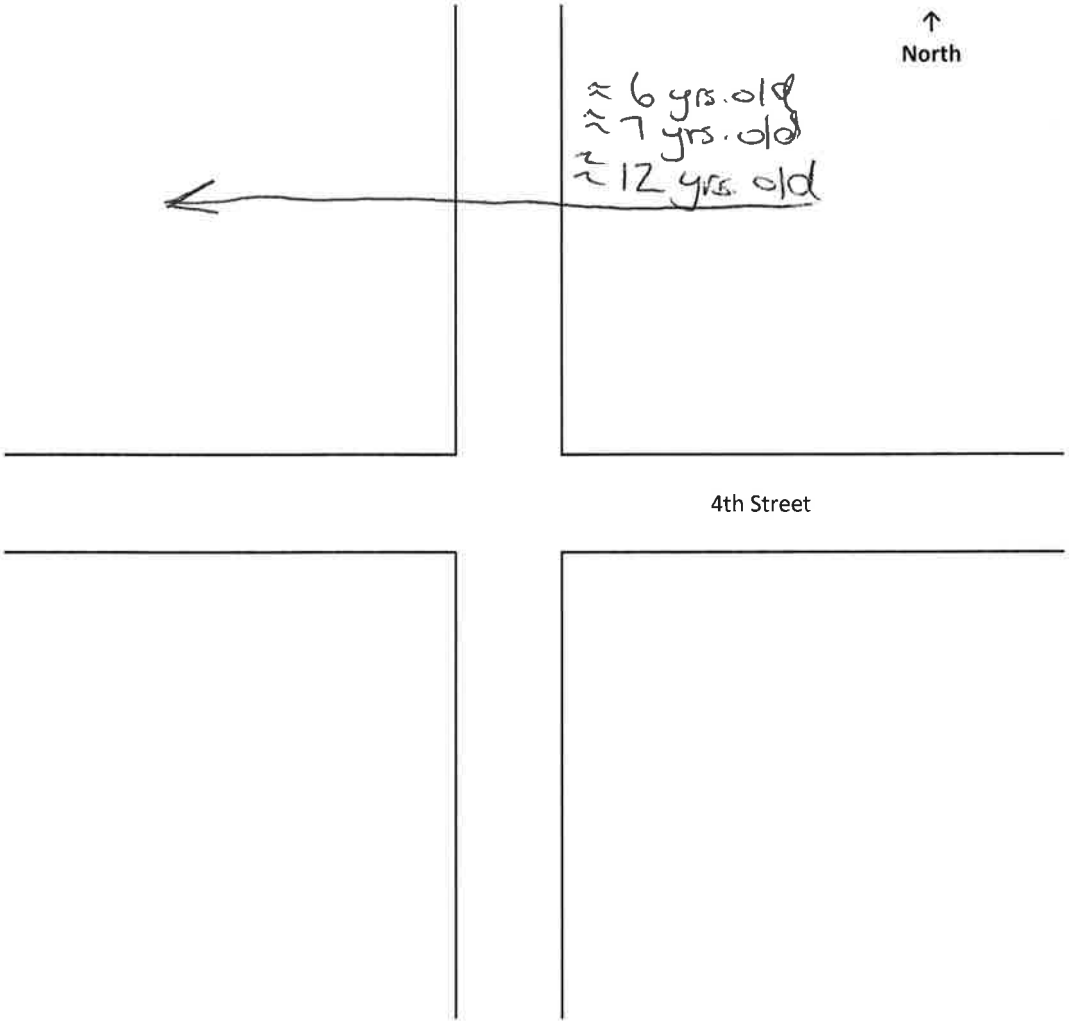
Intersection: 4th + Glover

Date: 4/23/12

Name: B. Cooper

Begin Time: 7:45 am End Time: 8:00 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

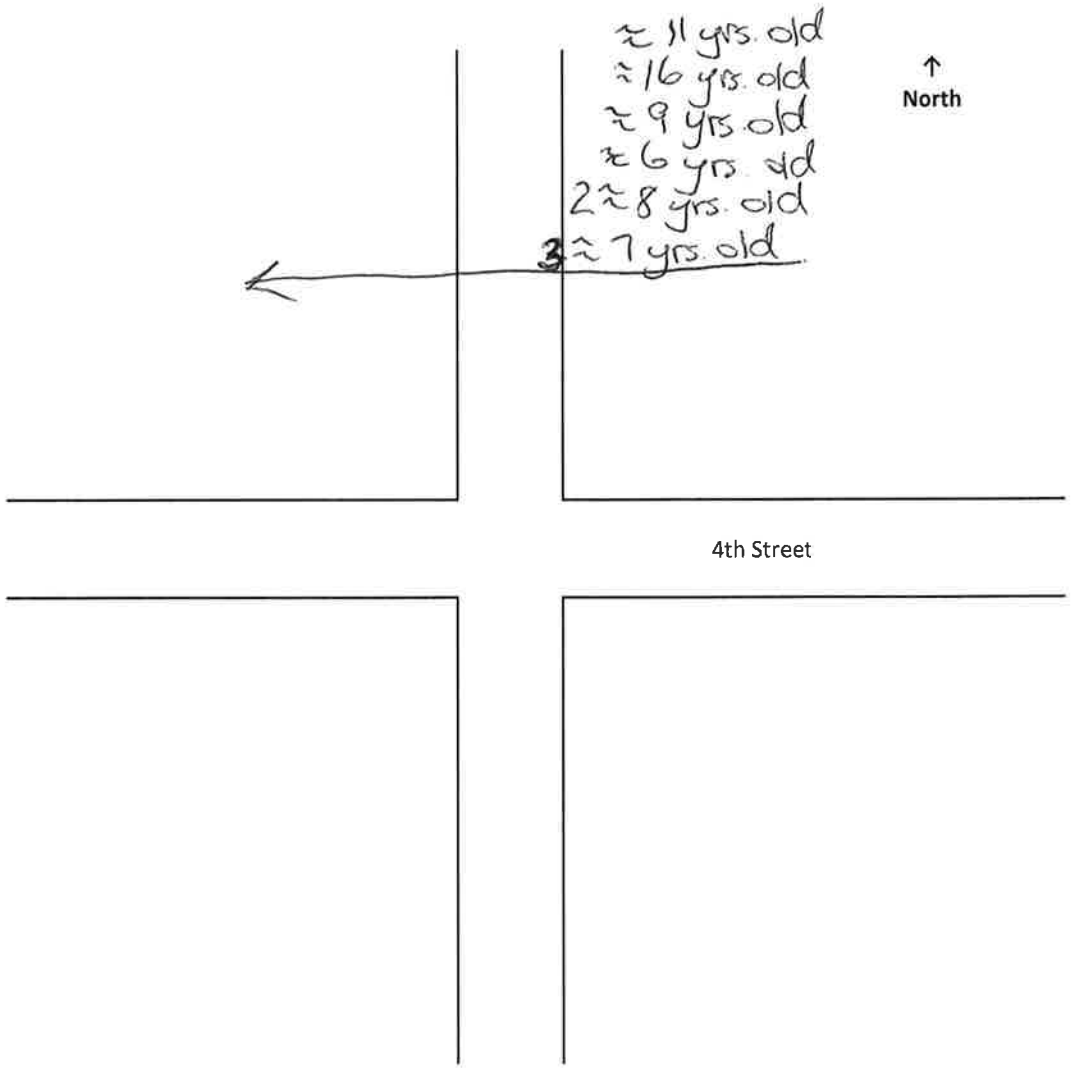
Intersection: 4th + Glover

Date: 4/23/12

Name: B. Cooper

Begin Time: 8:00 am End Time: 8:15 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

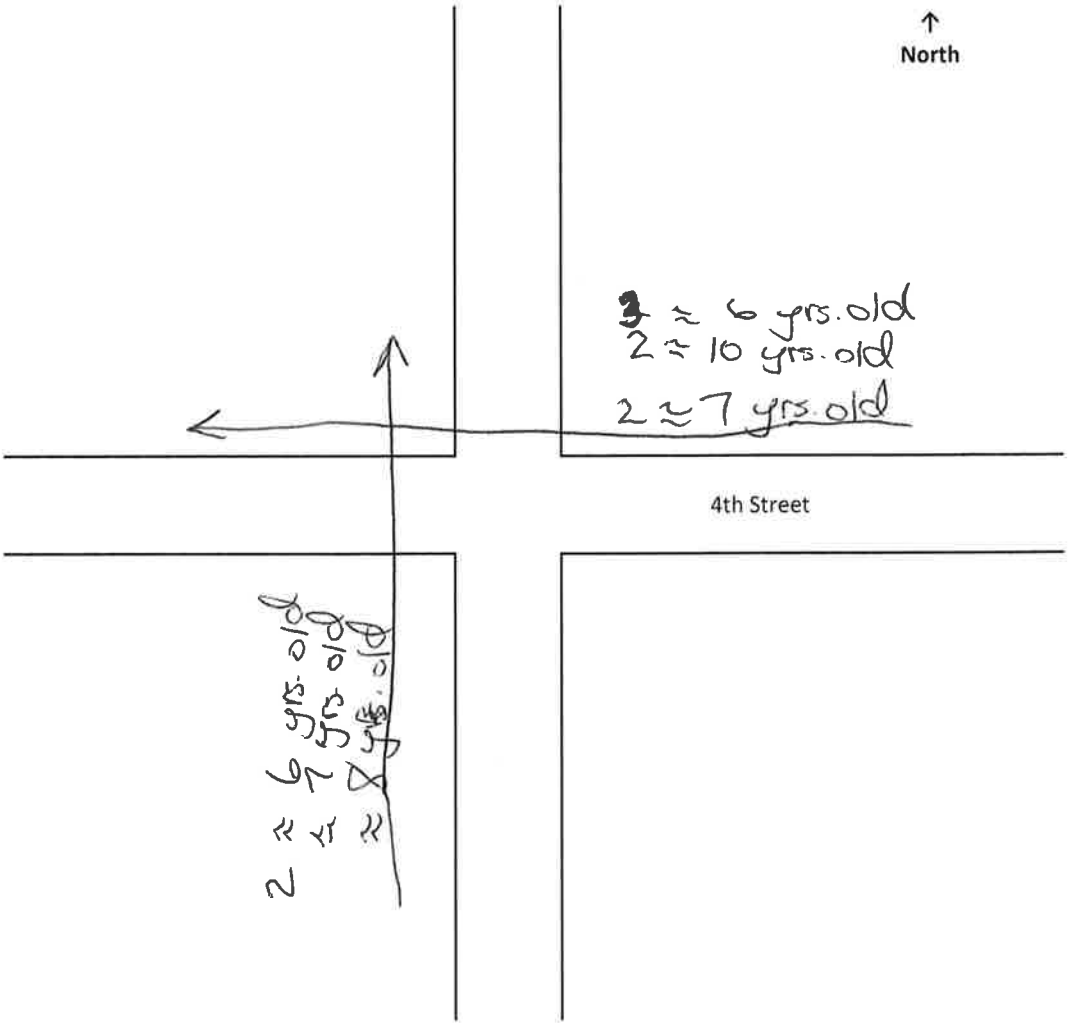
Intersection: 4th + Glover

Date: 4/23/12

Name: B. Cooper

Begin Time: 8:15 am End Time: 8:30 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

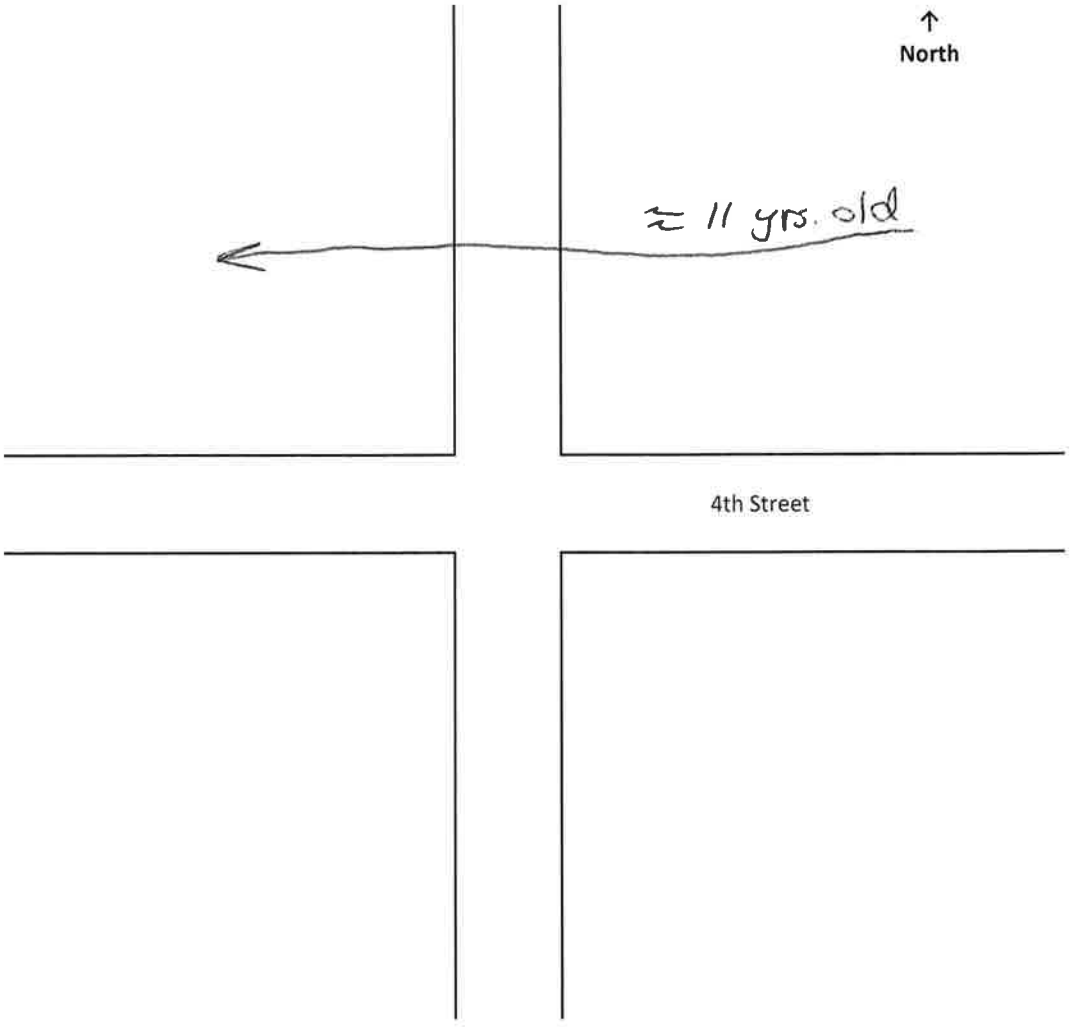
Intersection: 4th + Glover

Date: 4/23/12

Name: B. Cooper

Begin Time: 8:30 am End Time: 8:45 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

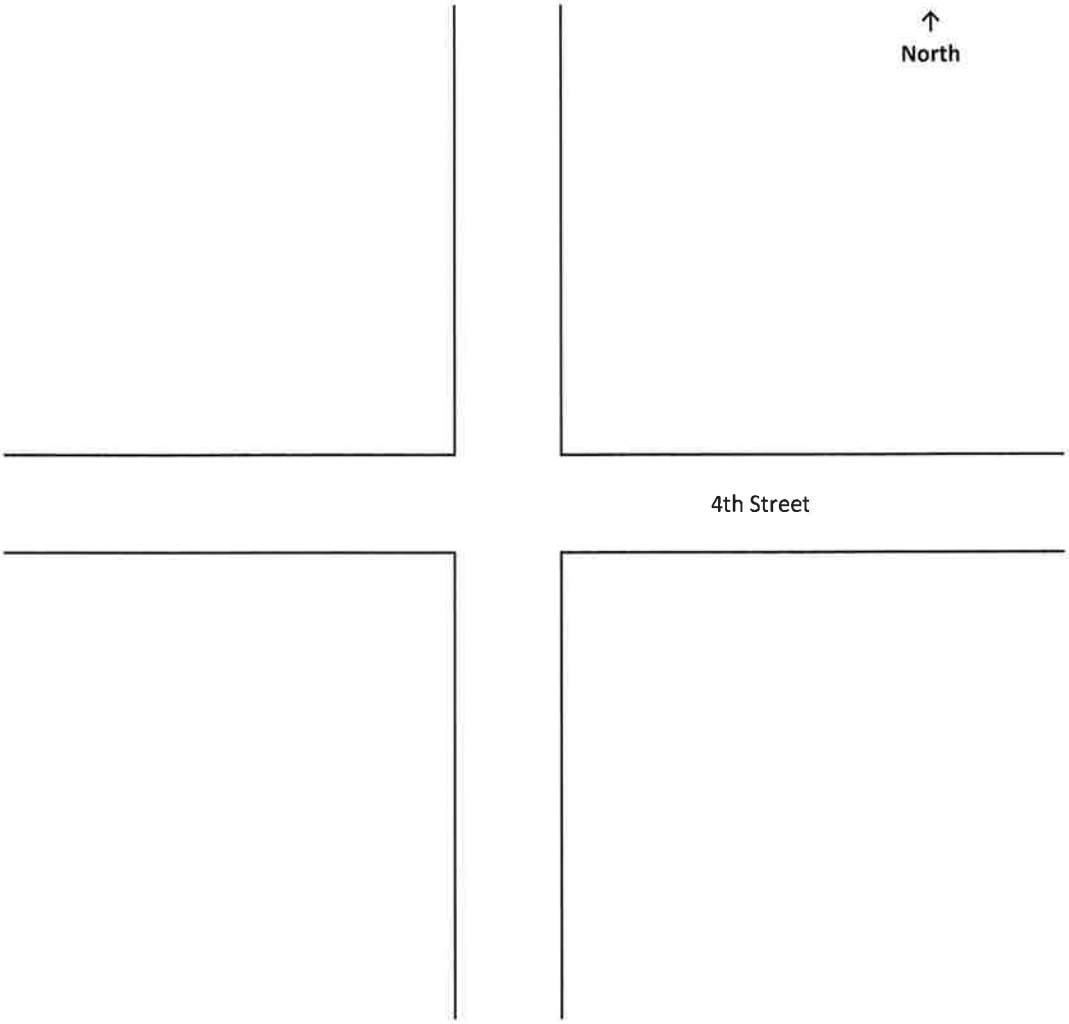
Intersection: 4th + Glover

Date: 4/23/12

Name: B. Cooper

Begin Time: 8:45 am End Time: 9:00 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

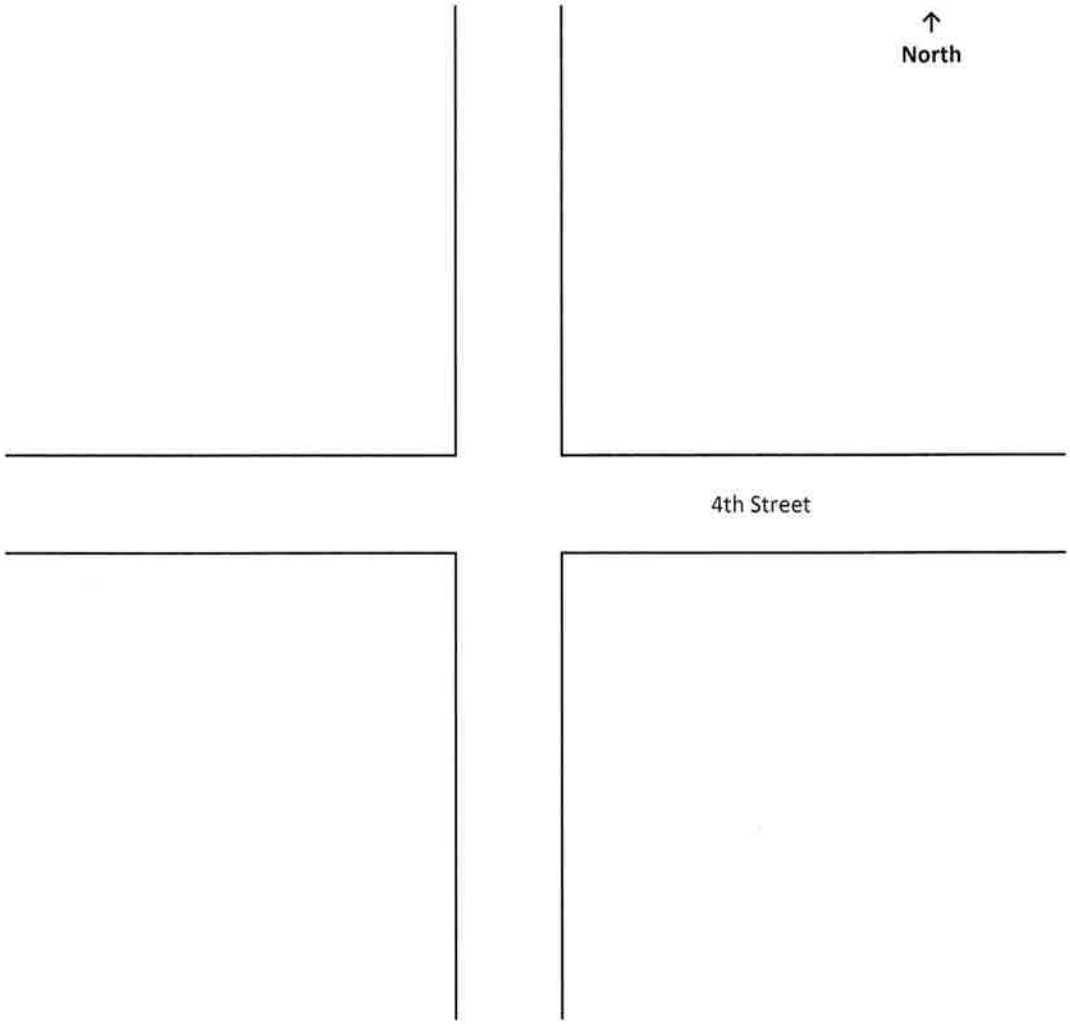
Intersection: 4th + Glover

Date: 4/23/12

Name: B. Cooper

Begin Time: 2:15 pm End Time: 2:30 pm

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

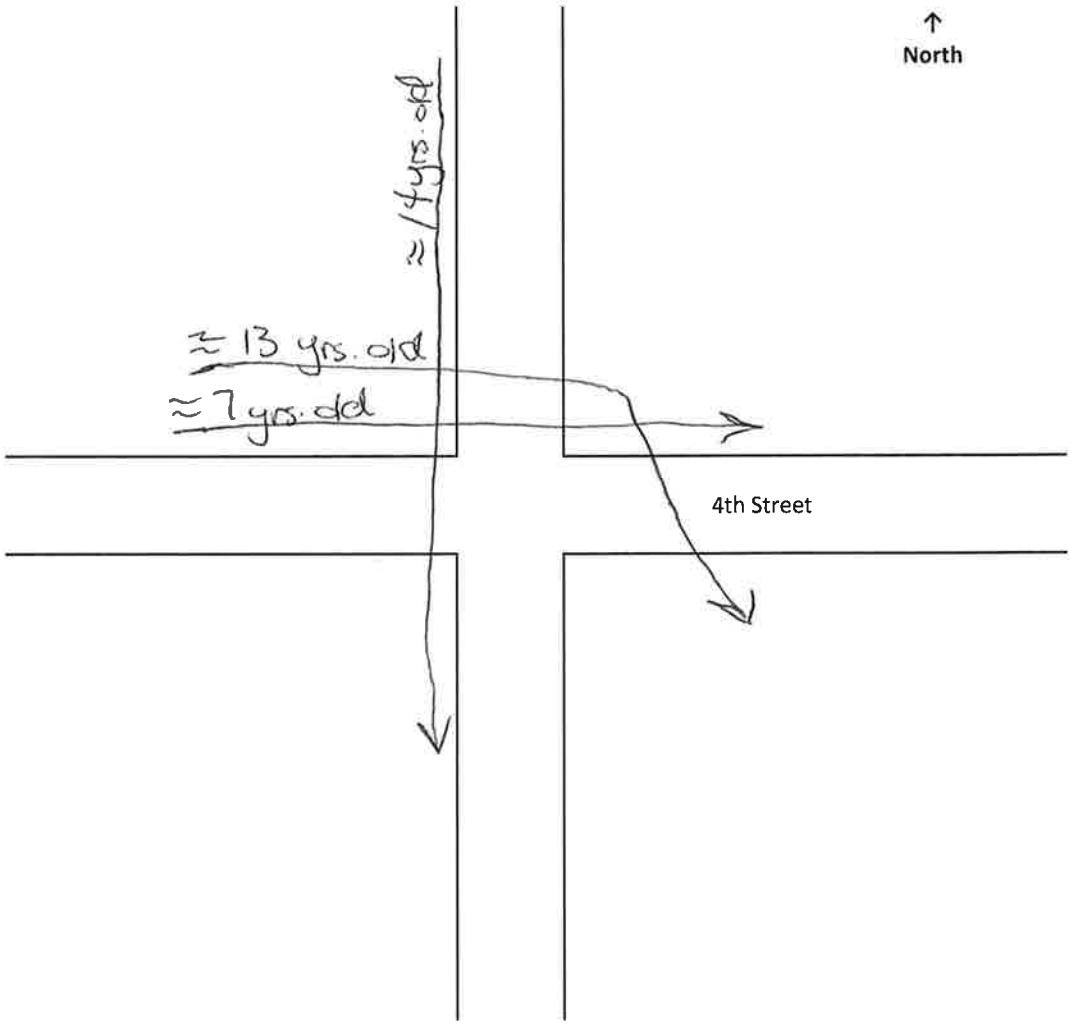
Intersection: 4th + Glover

Date: 4/23/12

Name: B. Cooper

Begin Time: 2:30 pm End Time: 2:45 pm

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

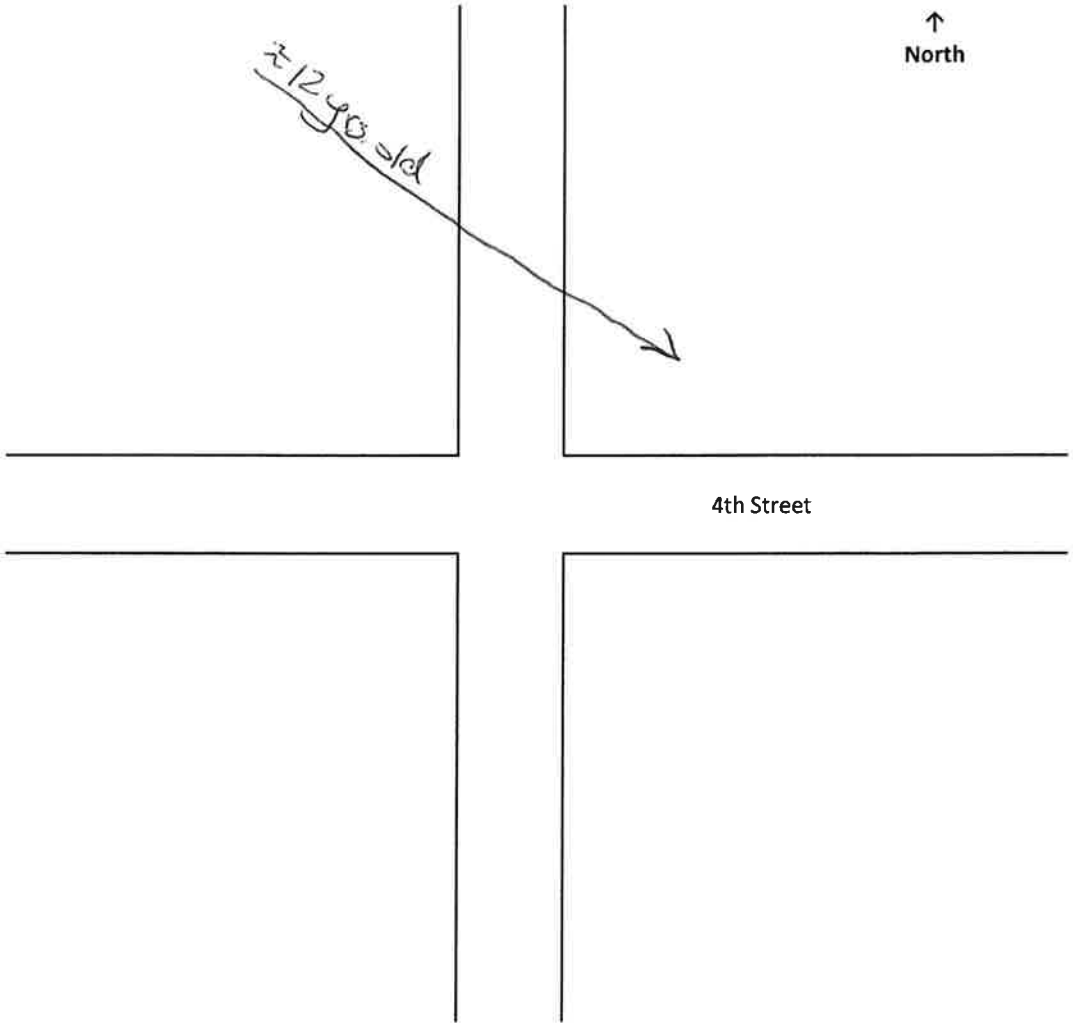
Intersection: 4th + Glover

Date: 4/23/12

Name: B. Cooper

Begin Time: 2:45 pm End Time: 3:00 pm

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

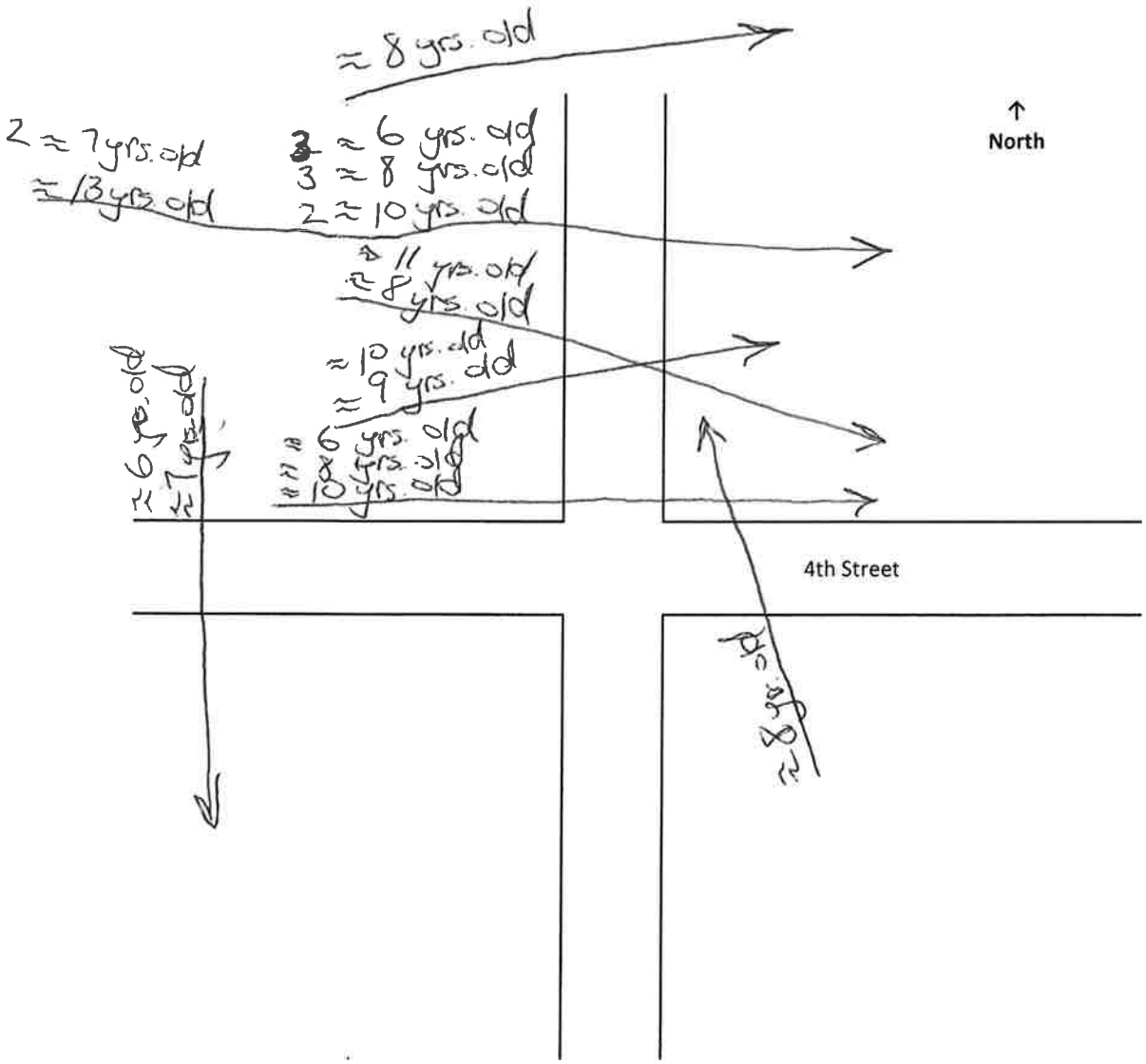
Intersection: 4th + Glover

Date: 4/23/12

Name: B. Cooper

Begin Time: 3:00 pm End Time: 3:15 pm

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

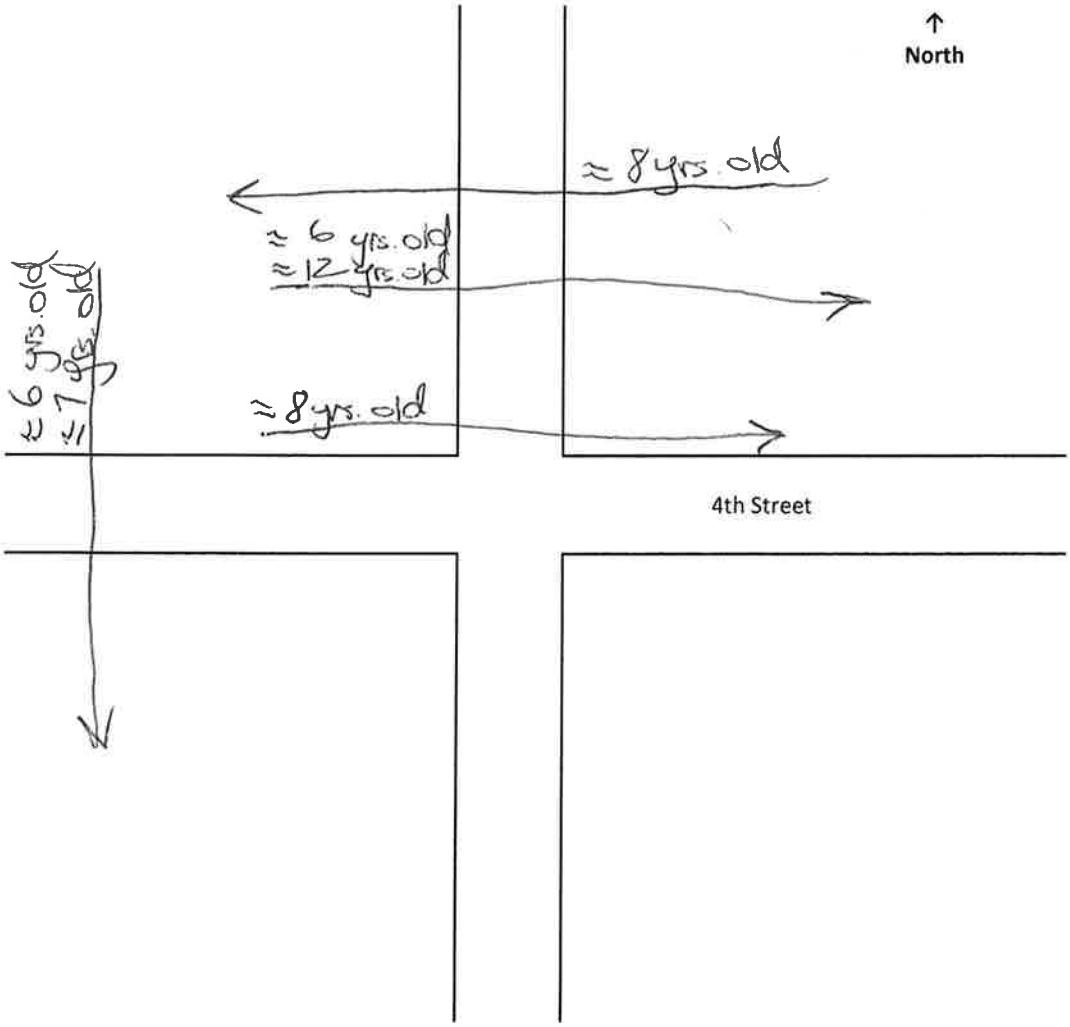
Intersection: 4th + Glover

Date: 4/23/12

Name: B. Cooper

Begin Time: 3:15 pm End Time: 3:30 pm

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

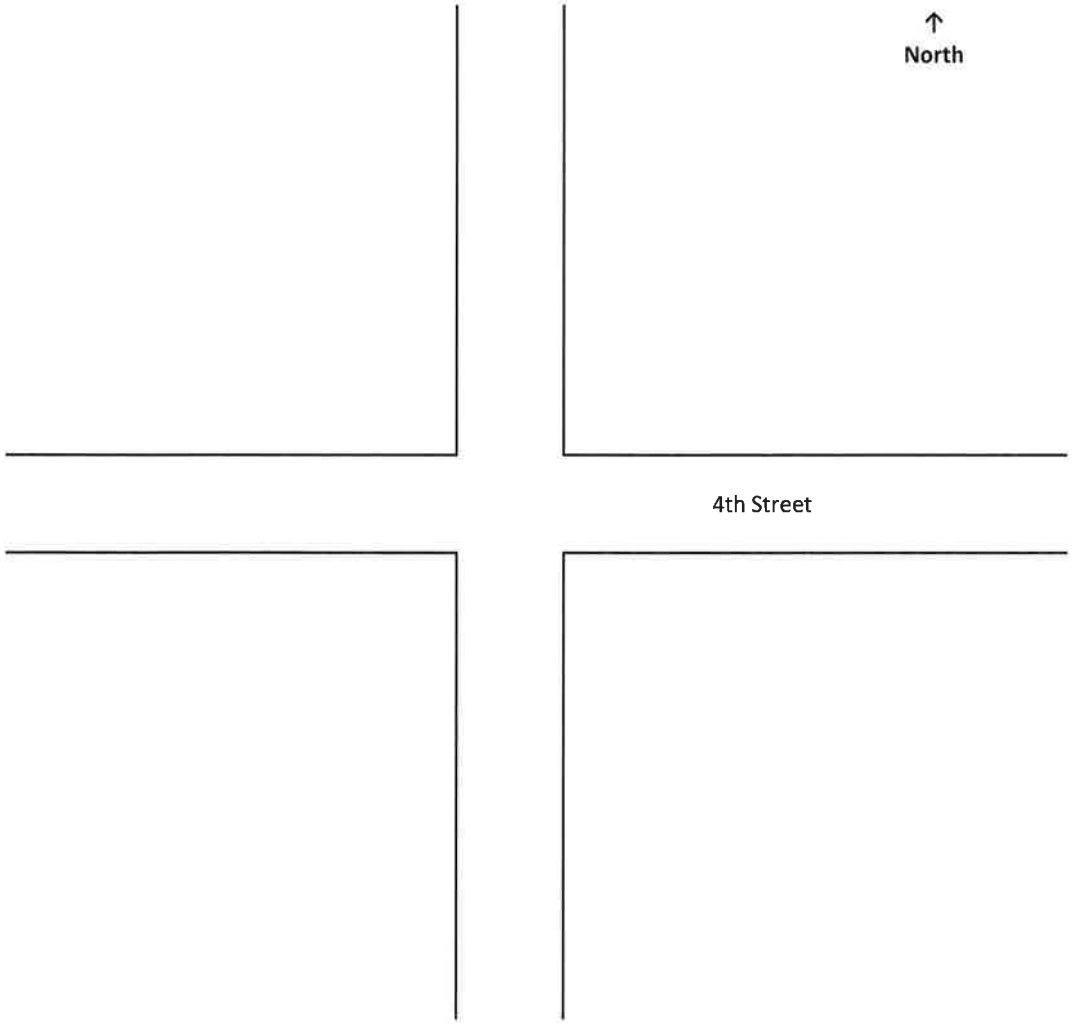
Intersection: 4th & Weller

Date: 4/18/12

Name: B. Cooper

Begin Time: 7:15am End Time: 7:30 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

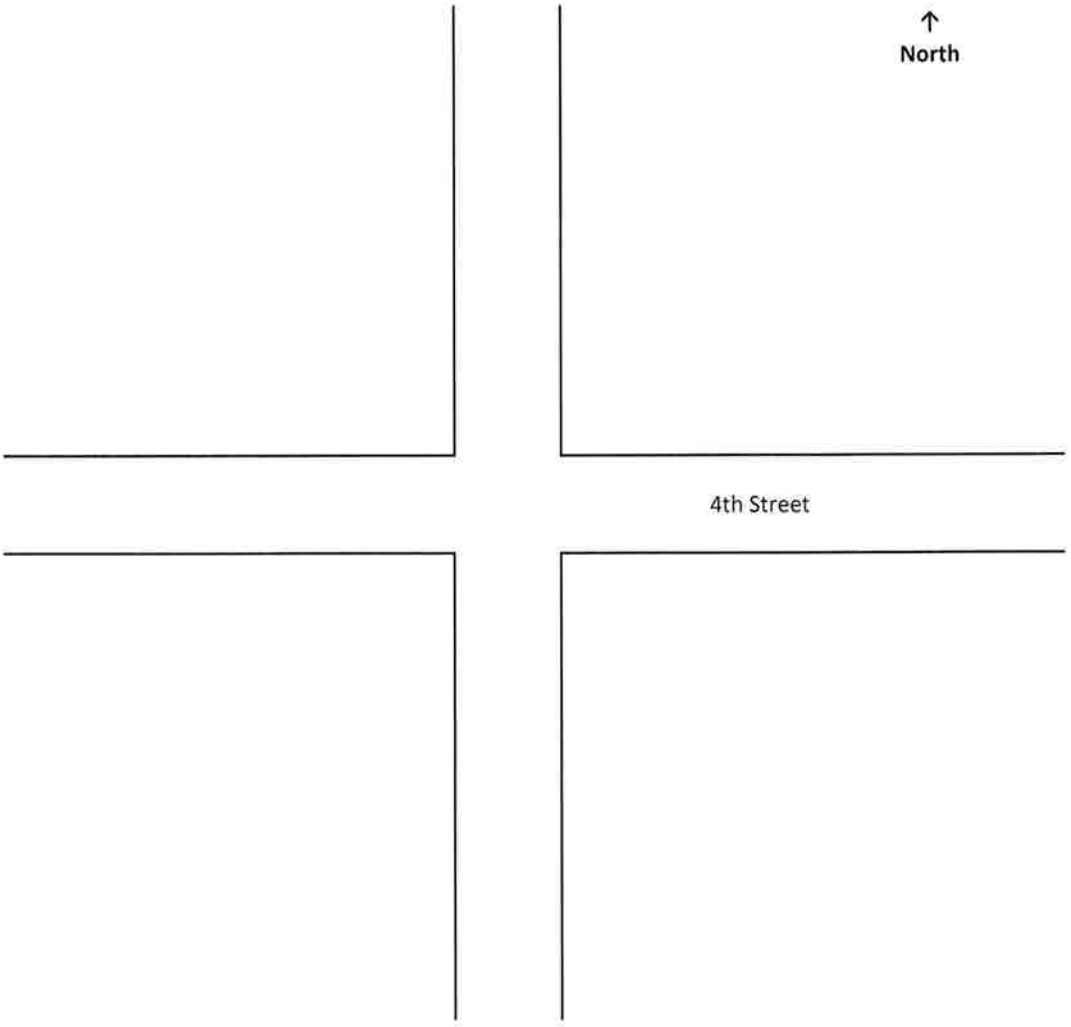
Intersection: 4th + Waller

Date: 4/18/12

Name: B. Cooper

Begin Time: 7:30 am End Time: 7:45 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

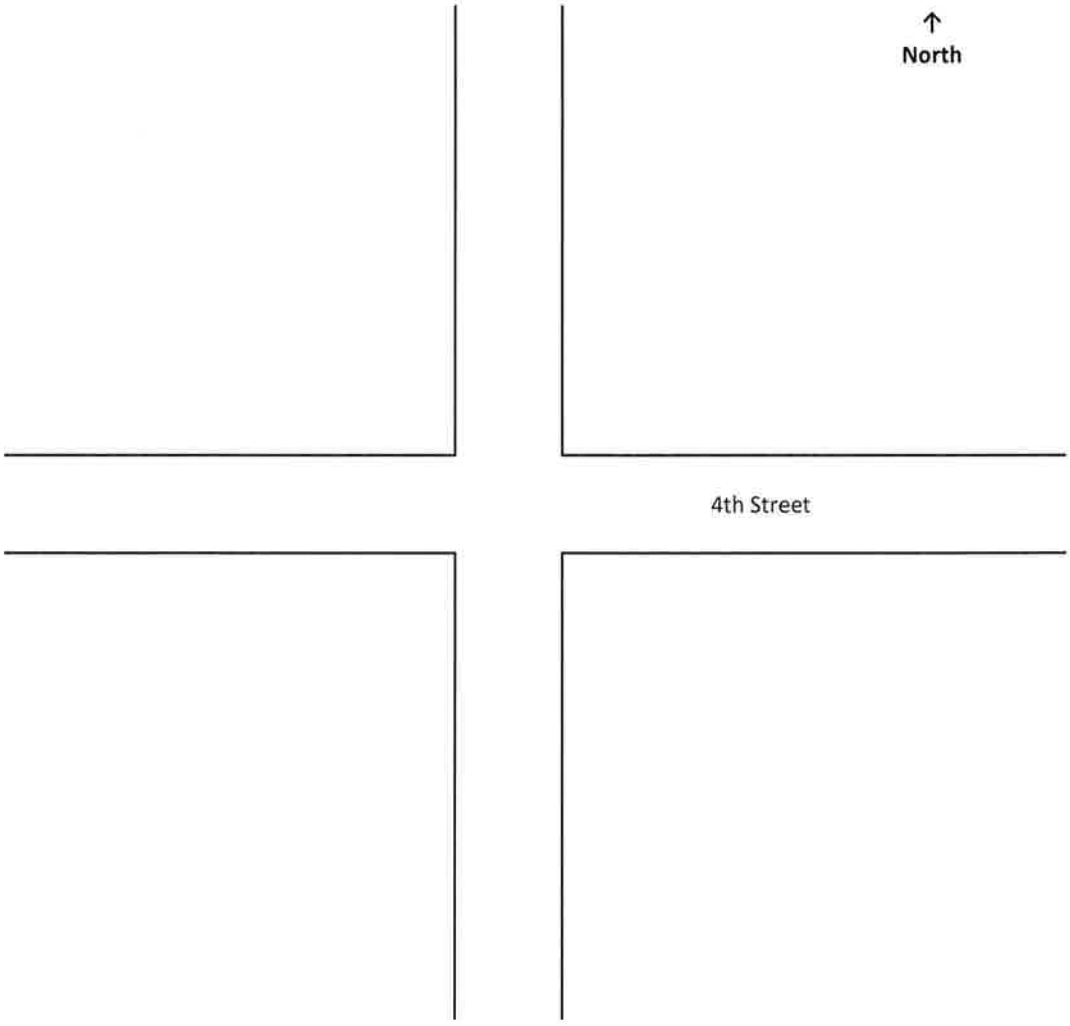
Intersection: 4th + Waller

Date: 4/18/12

Name: B. Cooper

Begin Time: 7:45 am End Time: 8:00 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

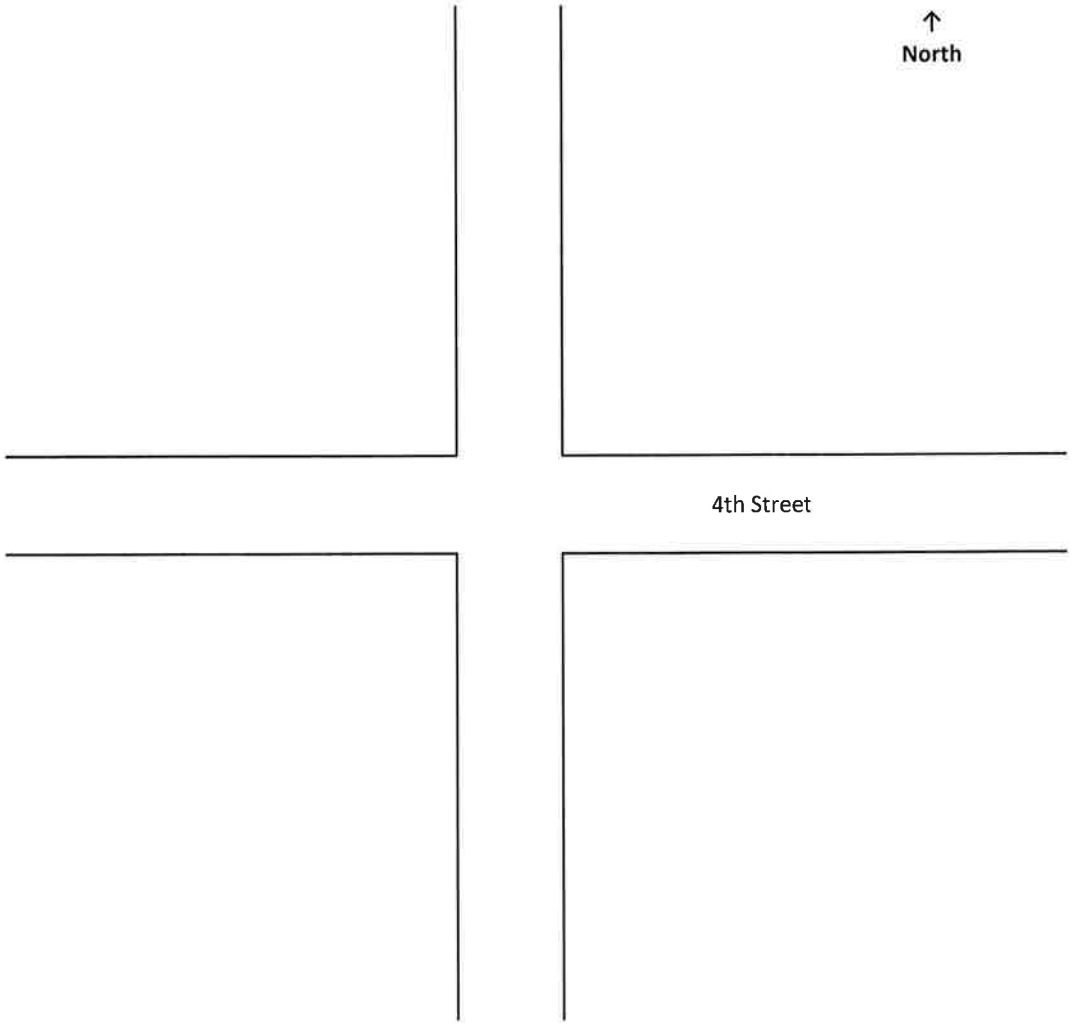
Intersection: 4th + Waller

Date: 4/18/12

Name: B. Cooper

Begin Time: 8:00 am End Time: 8:15 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

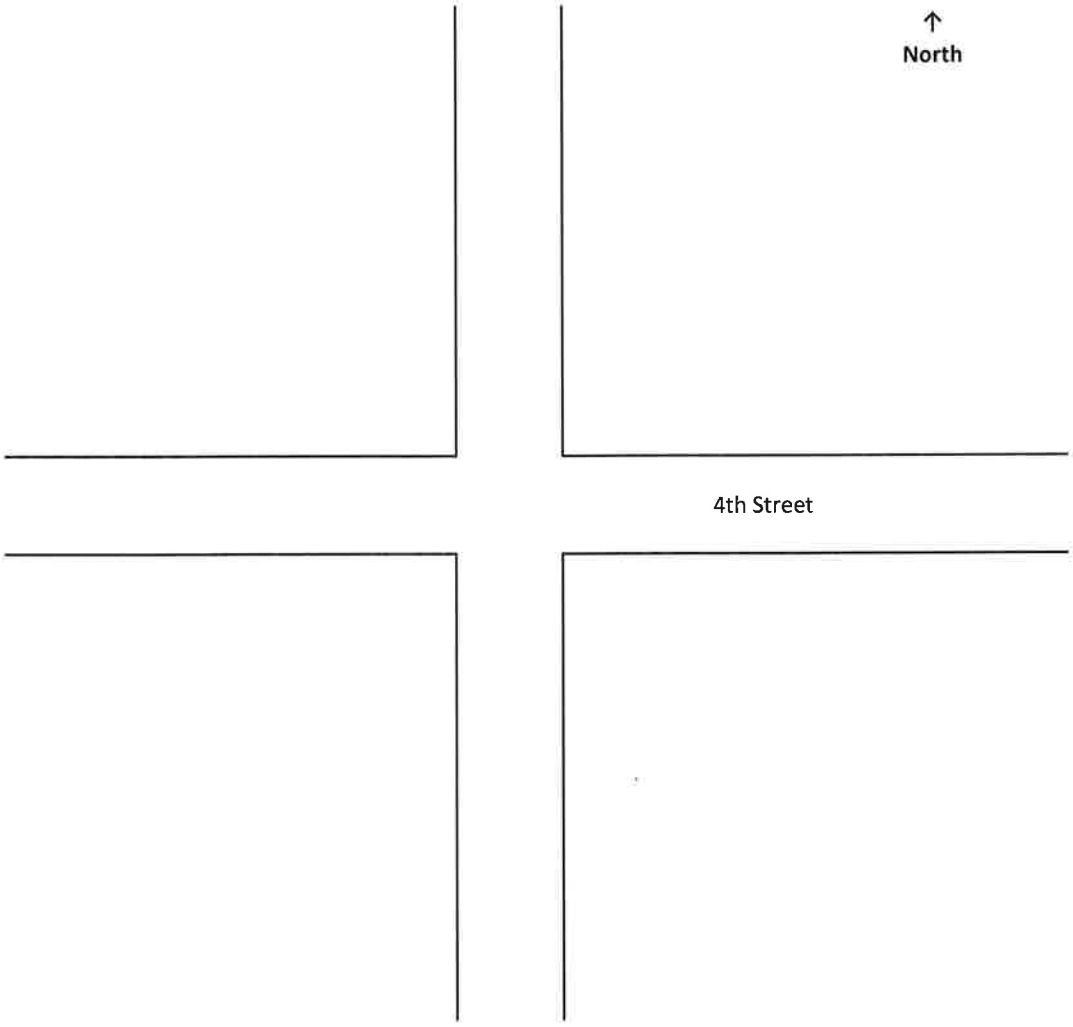
Intersection: 4th + Waller

Date: 4/18/12

Name: B. Cooper

Begin Time: 8:15 am End Time: 8:30 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

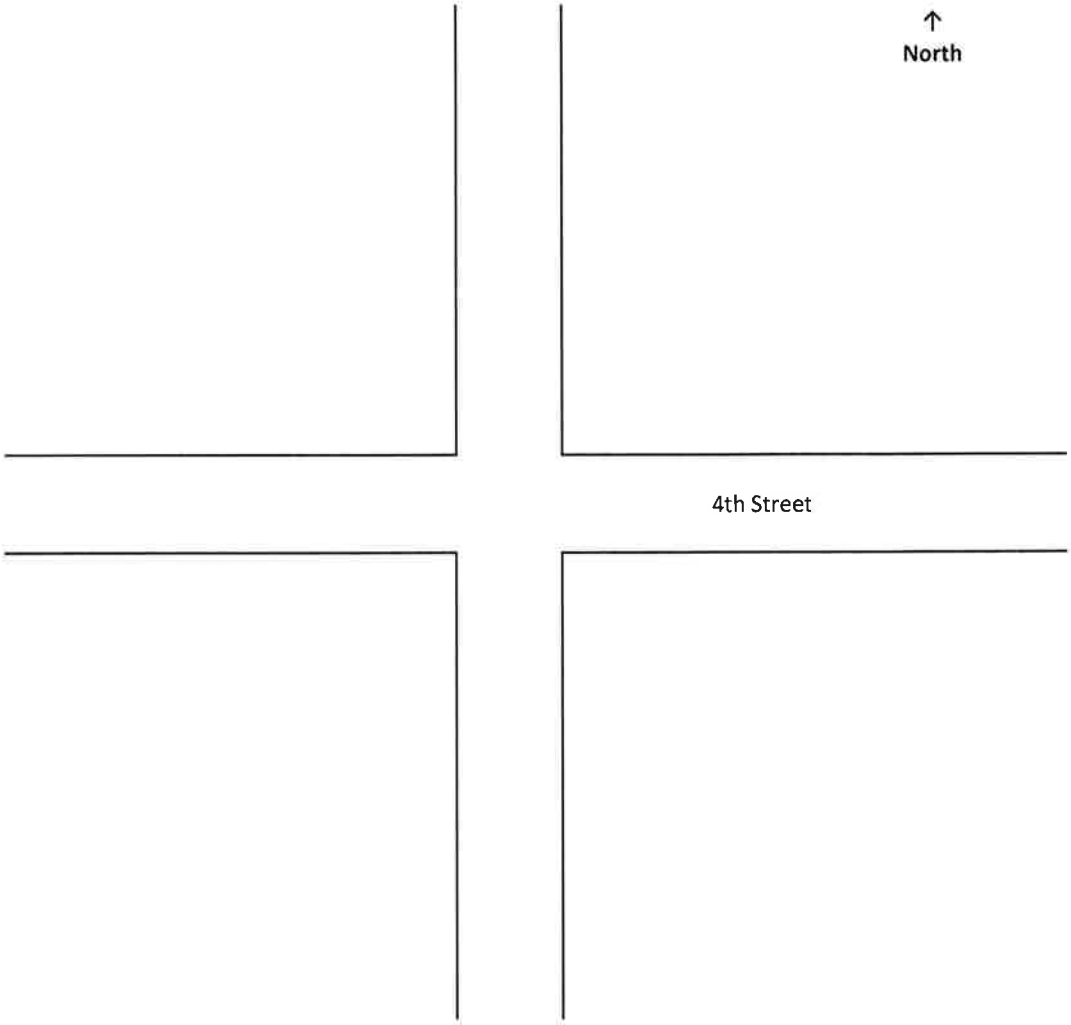
Intersection: 4th + Waller

Date: 4/18/12

Name: B. Cooper

Begin Time: 8:30 am End Time: 8:45 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

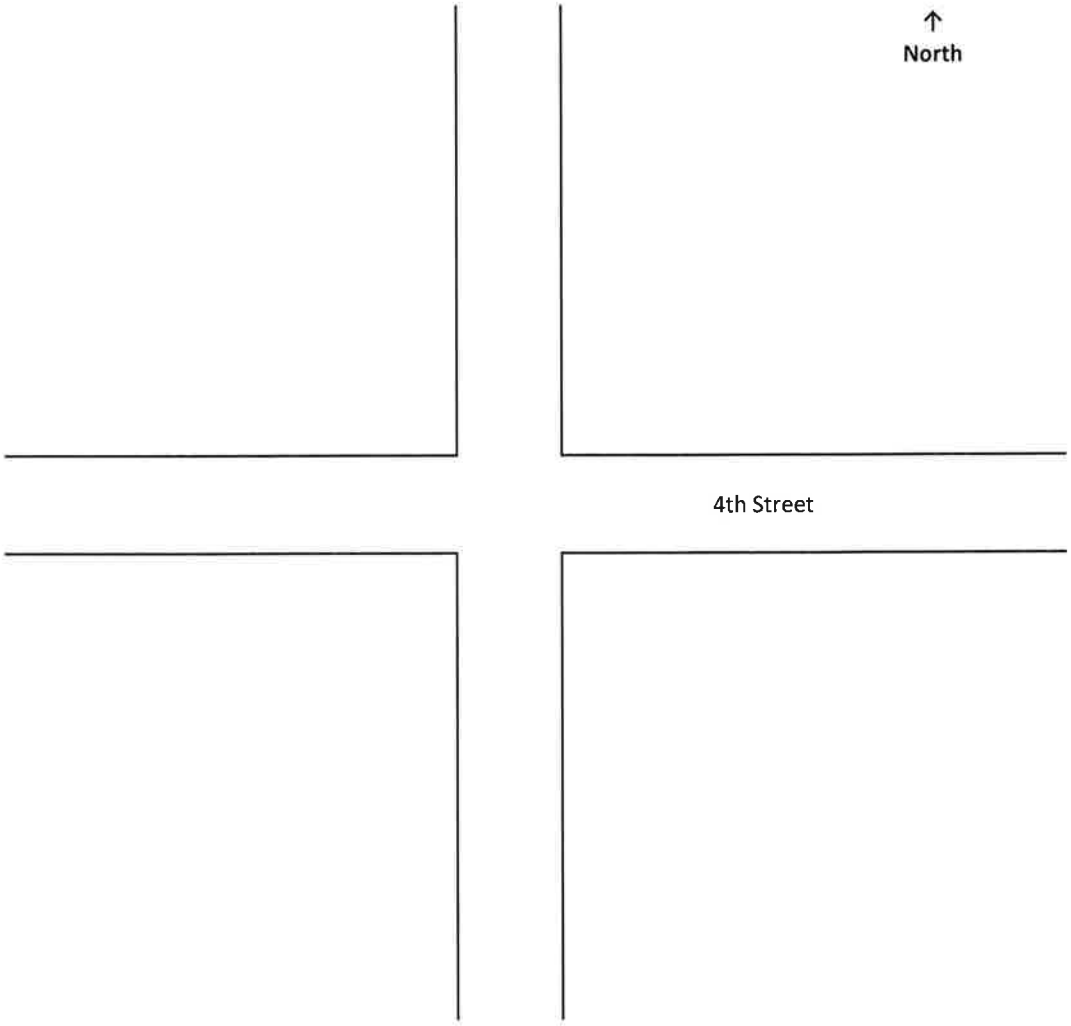
Intersection: 4th + Waller

Date: 4/18/12

Name: B. Cooper

Begin Time: 8:45am End Time: 9:00 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

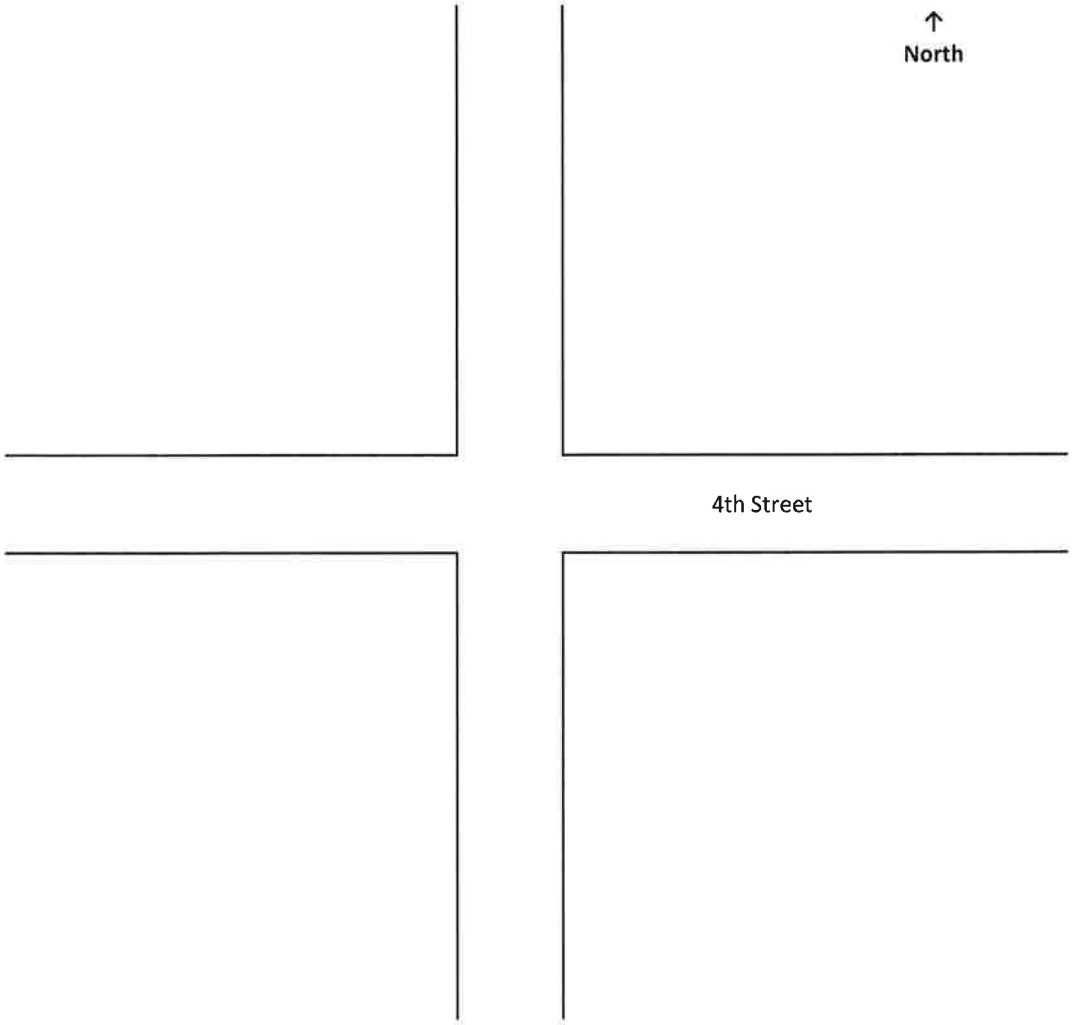
Intersection: 4th + Waller

Date: 4/18/12

Name: B. Cooper

Begin Time: 2:15 pm End Time: 2:30 pm

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

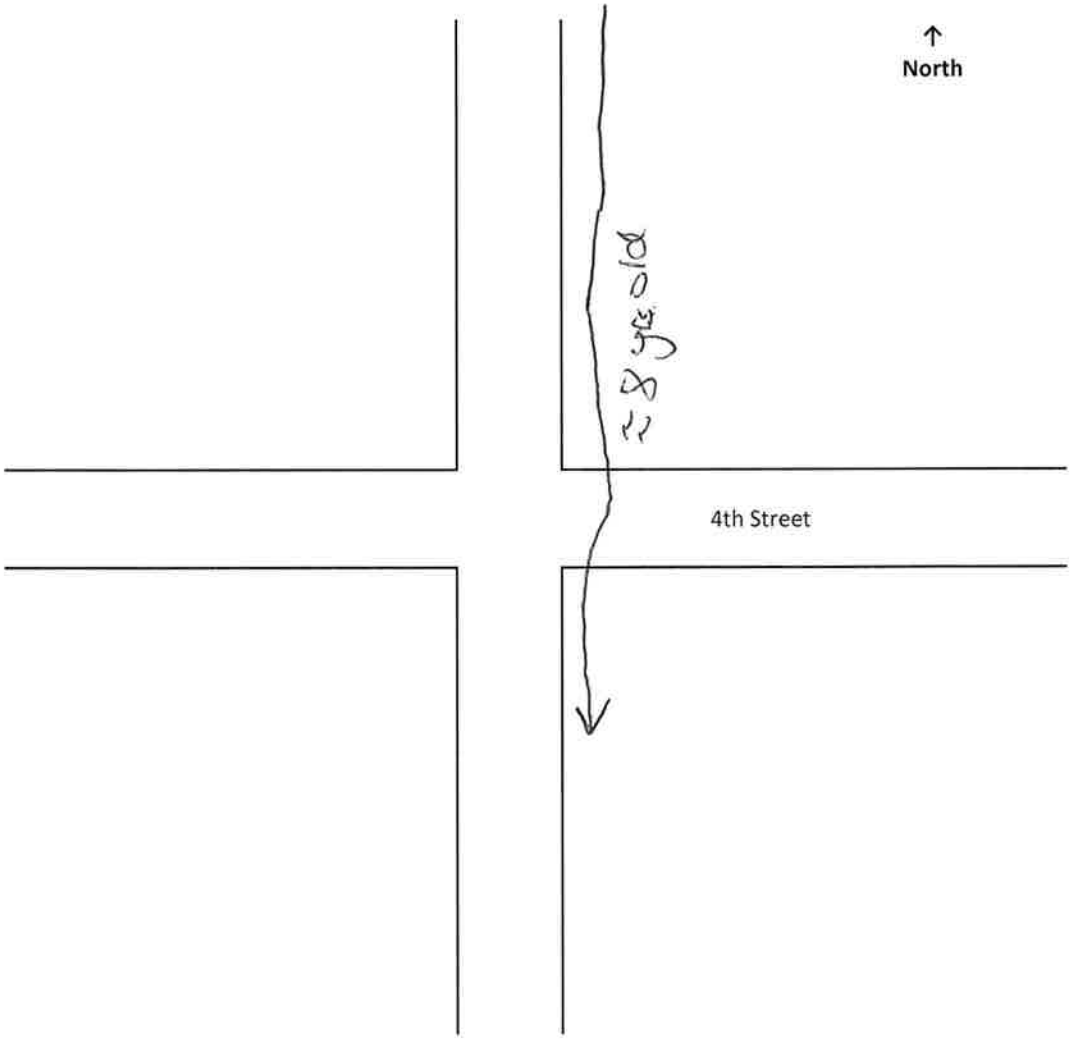
Intersection: 4th & Waller

Date: 4/18/12

Name: B. Cooper

Begin Time: 2:30 pm End Time: 2:45 pm

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

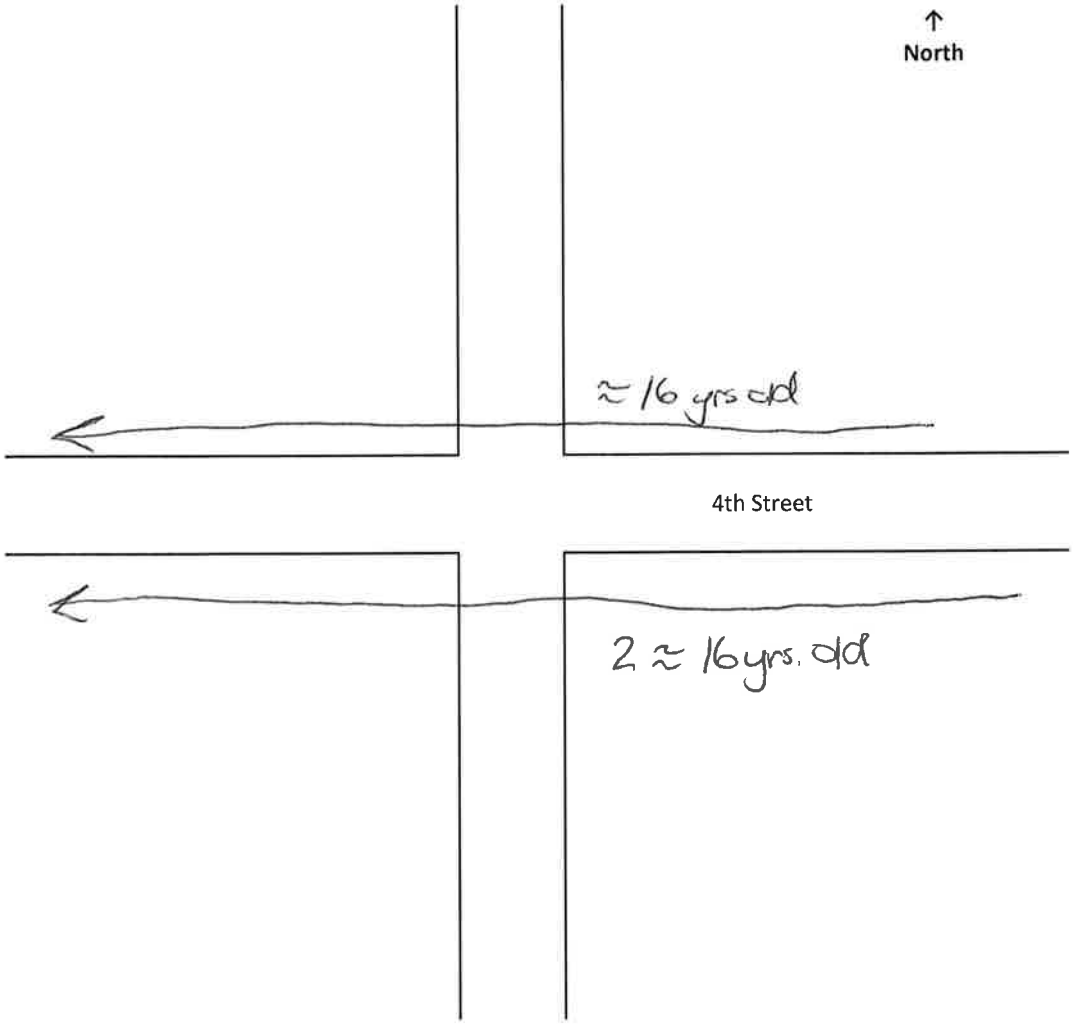
Intersection: 4th + Walker

Date: 4/18/12

Name: B. Cooper

Begin Time: 2:45 pm End Time: 3:00 pm

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

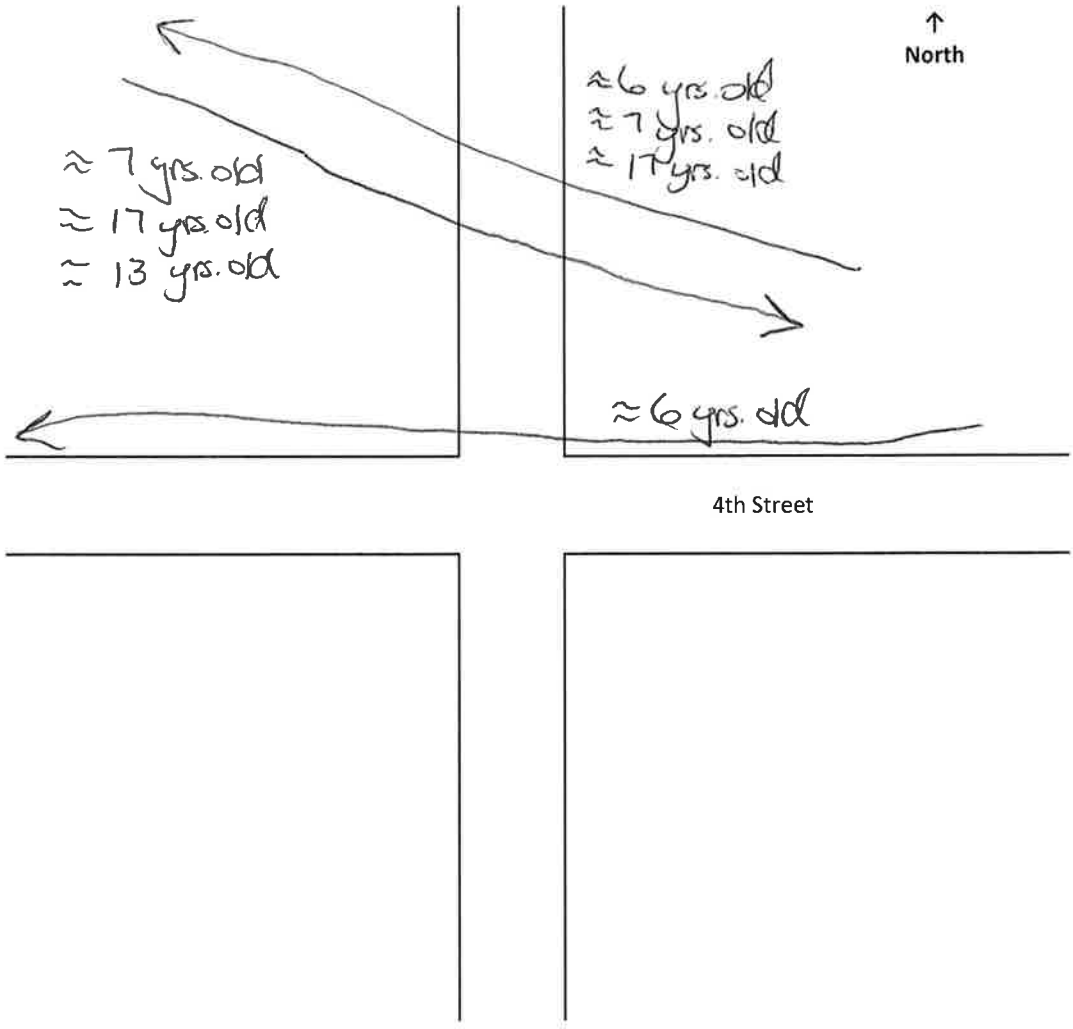
Intersection: 4th + Waller

Date: 4/18/12

Name: B. Cooper

Begin Time: 3:00 pm End Time: 3:15 pm

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

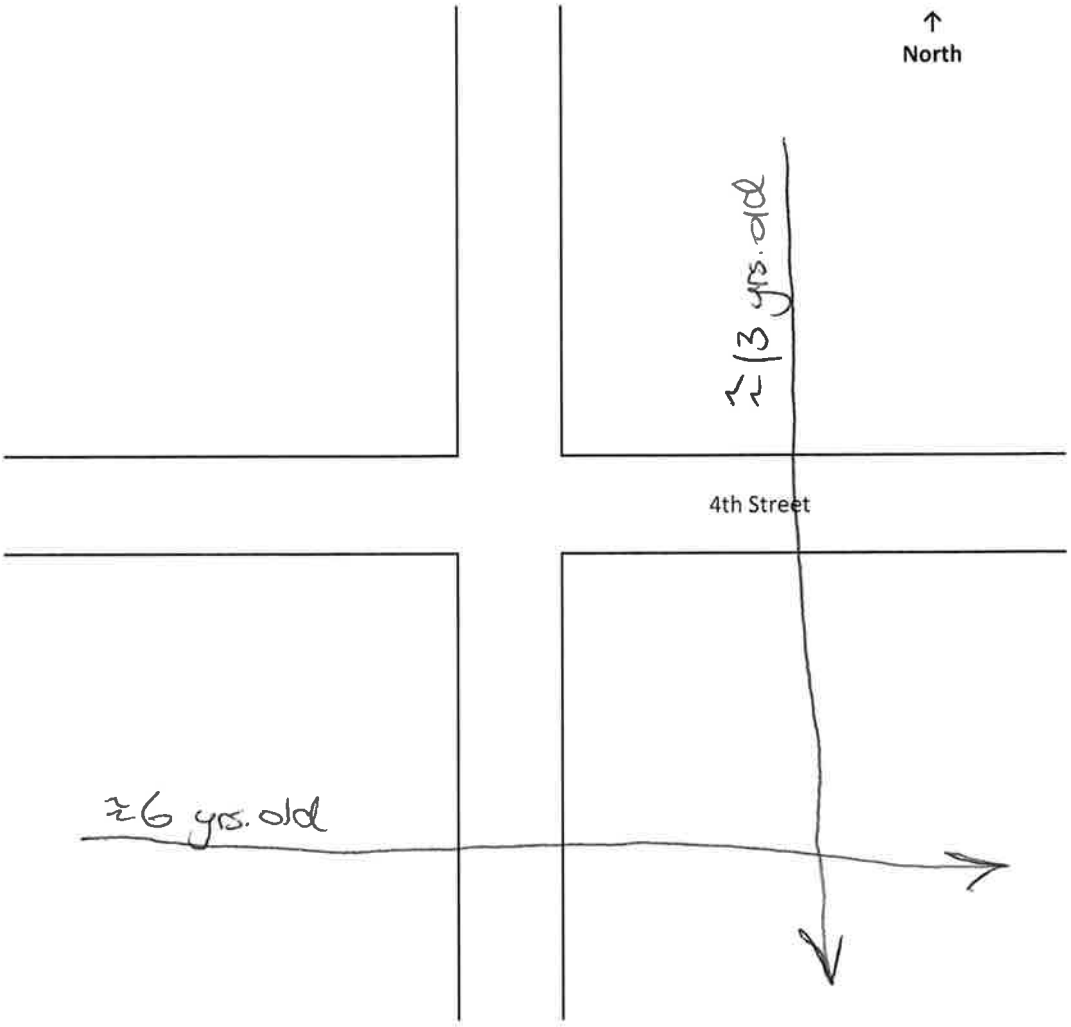
Intersection: 4th + Waller

Date: 4/18/12

Name: B. Cooper

Begin Time: 3:15 pm End Time: 3:30 pm

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

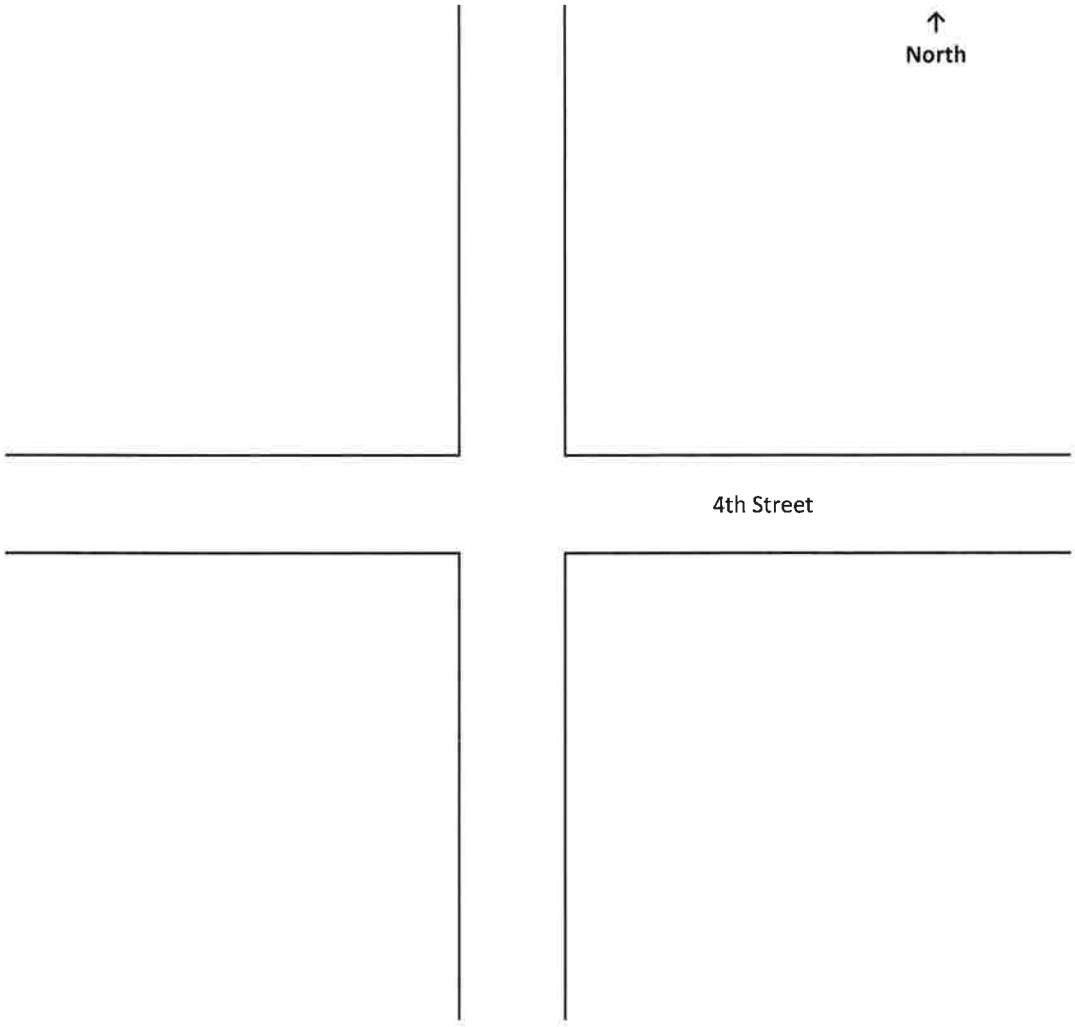
Intersection: 4th + Union

Date: 4/19/12

Name: B. Cooper

Begin Time: 7:15 am End Time: 7:30 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

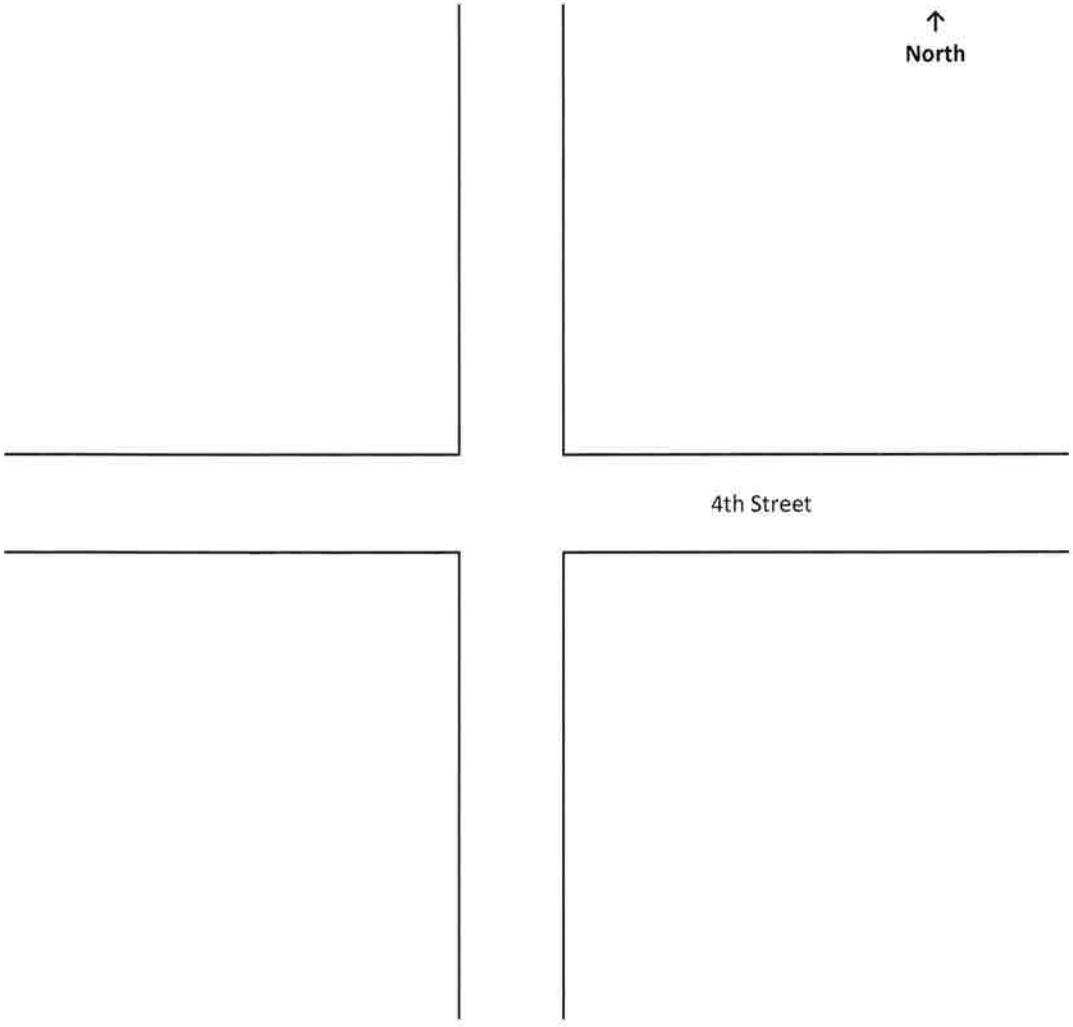
Intersection: 4th + Union

Date: 4/19/12

Name: B. Cooper

Begin Time: 7:30 am End Time: 7:45 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

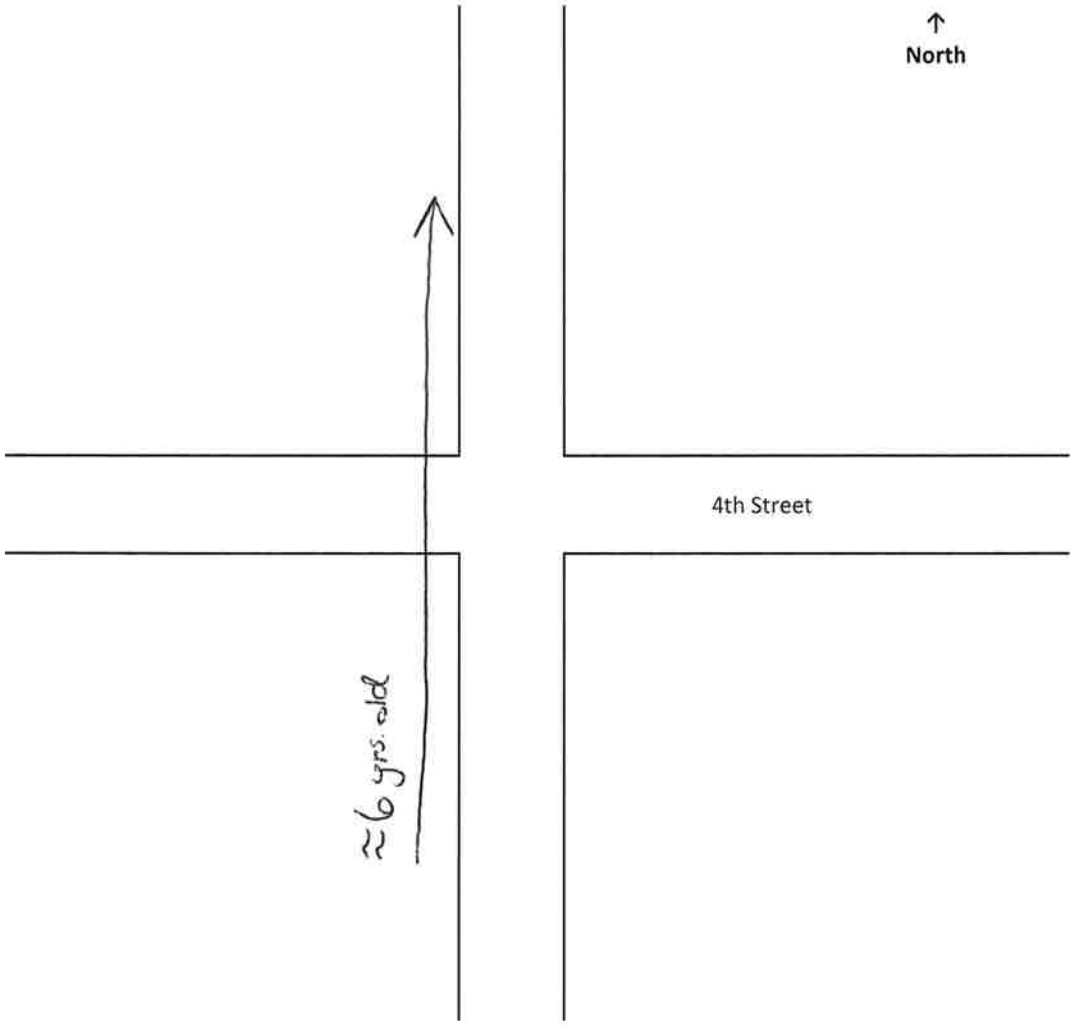
Intersection: 4th + Union

Date: 4/19/12

Name: B. Cooper

Begin Time: 7:45 am End Time: 8:00 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

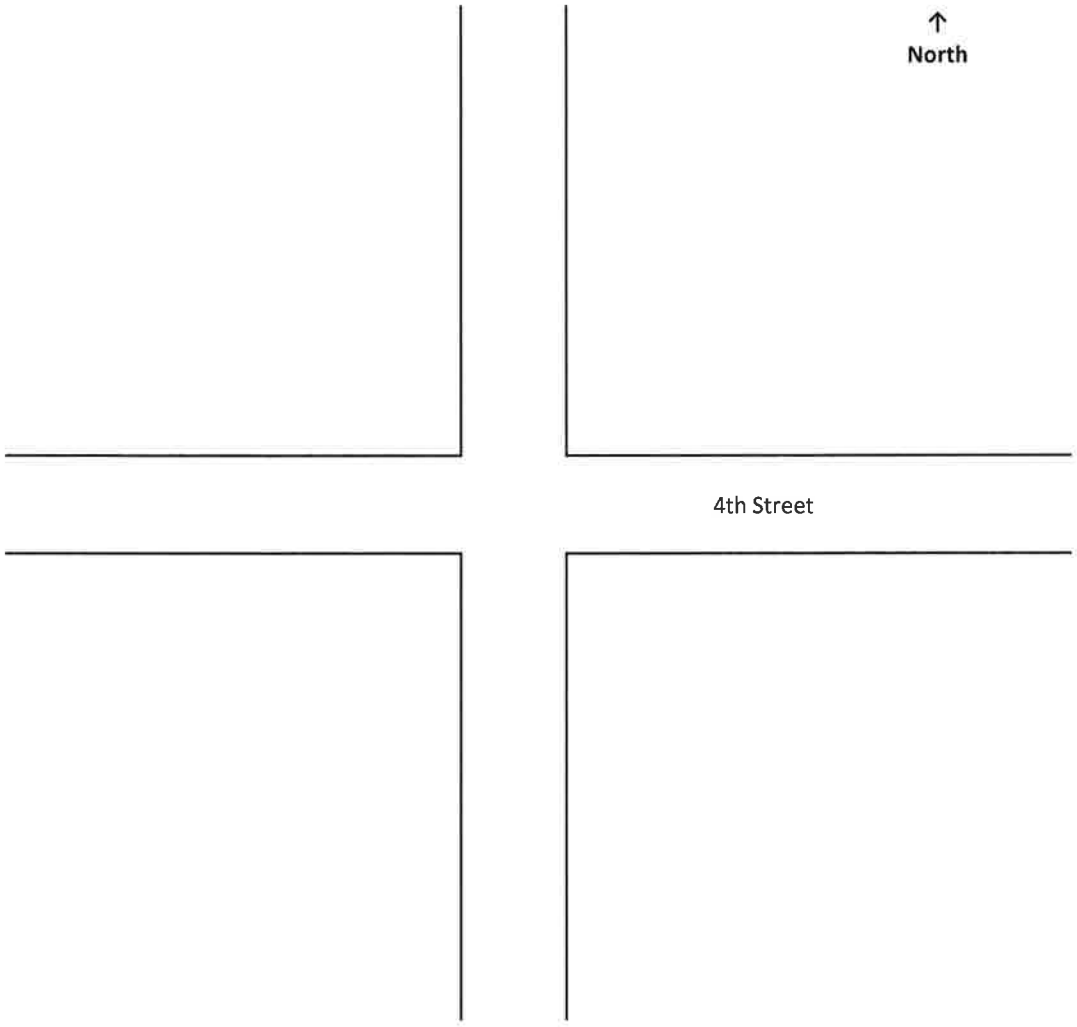
Intersection: 4th + Union

Date: 4/19/12

Name: B. Cooper

Begin Time: 8:00 am End Time: 8:15 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

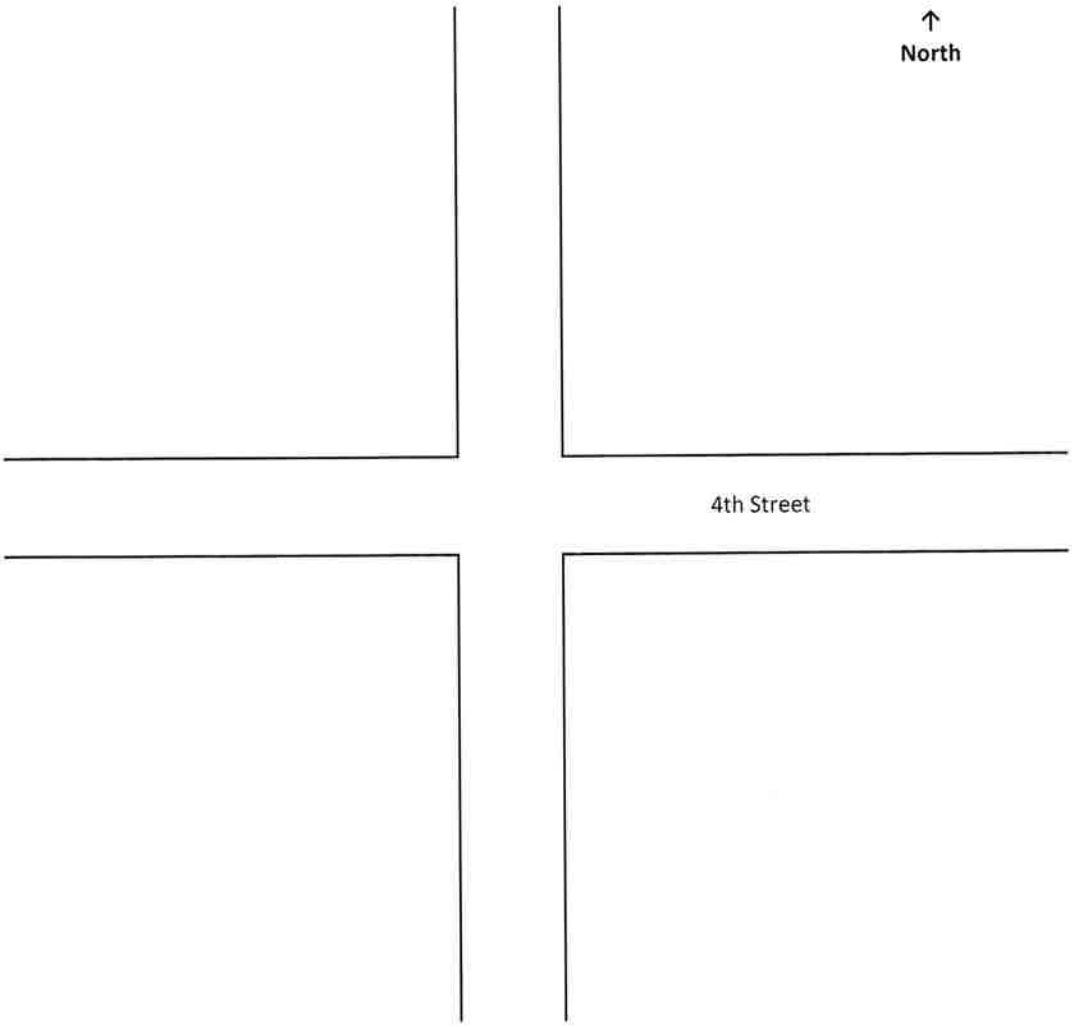
Intersection: 4th + Union

Date: 4/19/12

Name: B. Cooper

Begin Time: 8:15 am End Time: 8:30 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

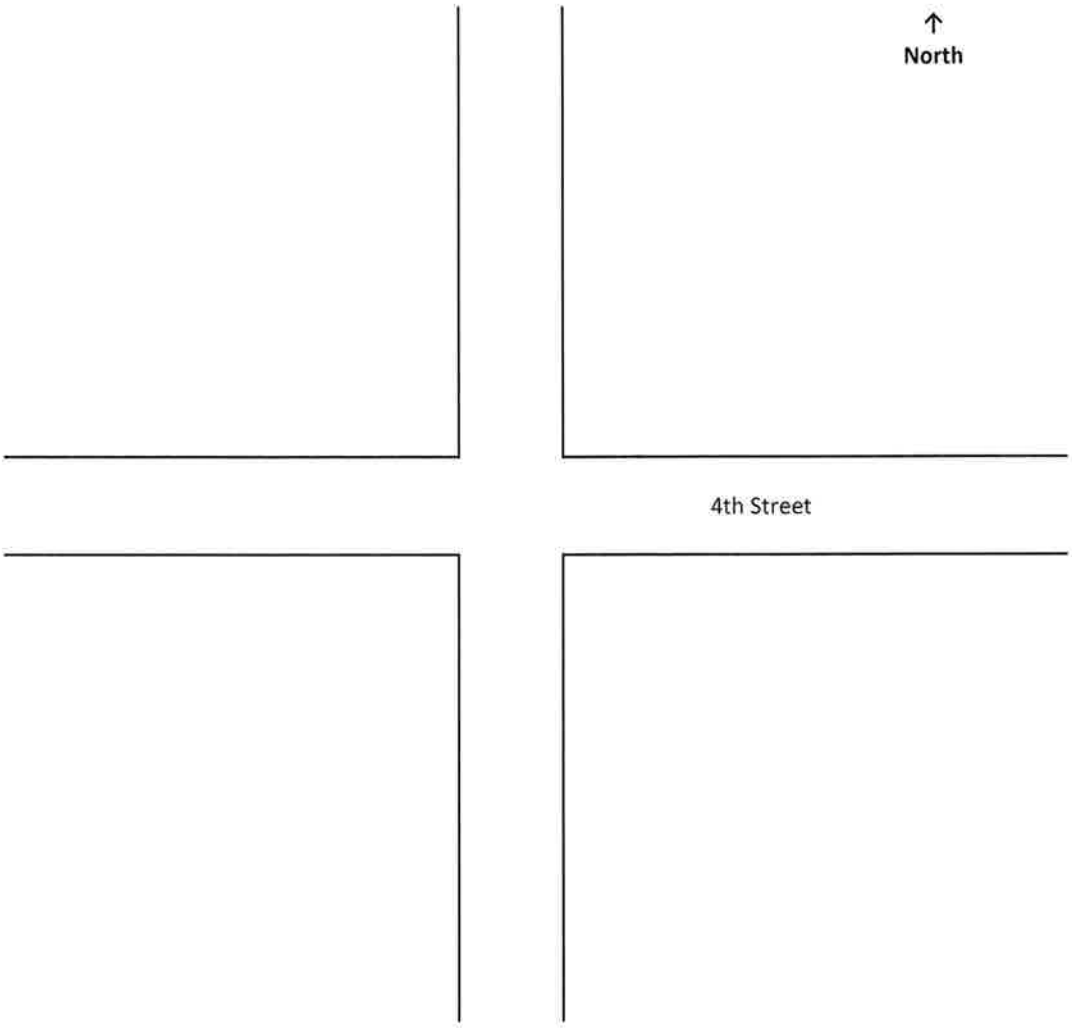
Intersection: 4th & Union

Date: 4/19/12

Name: B. Cooper

Begin Time: 8:30 am End Time: 8:45 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

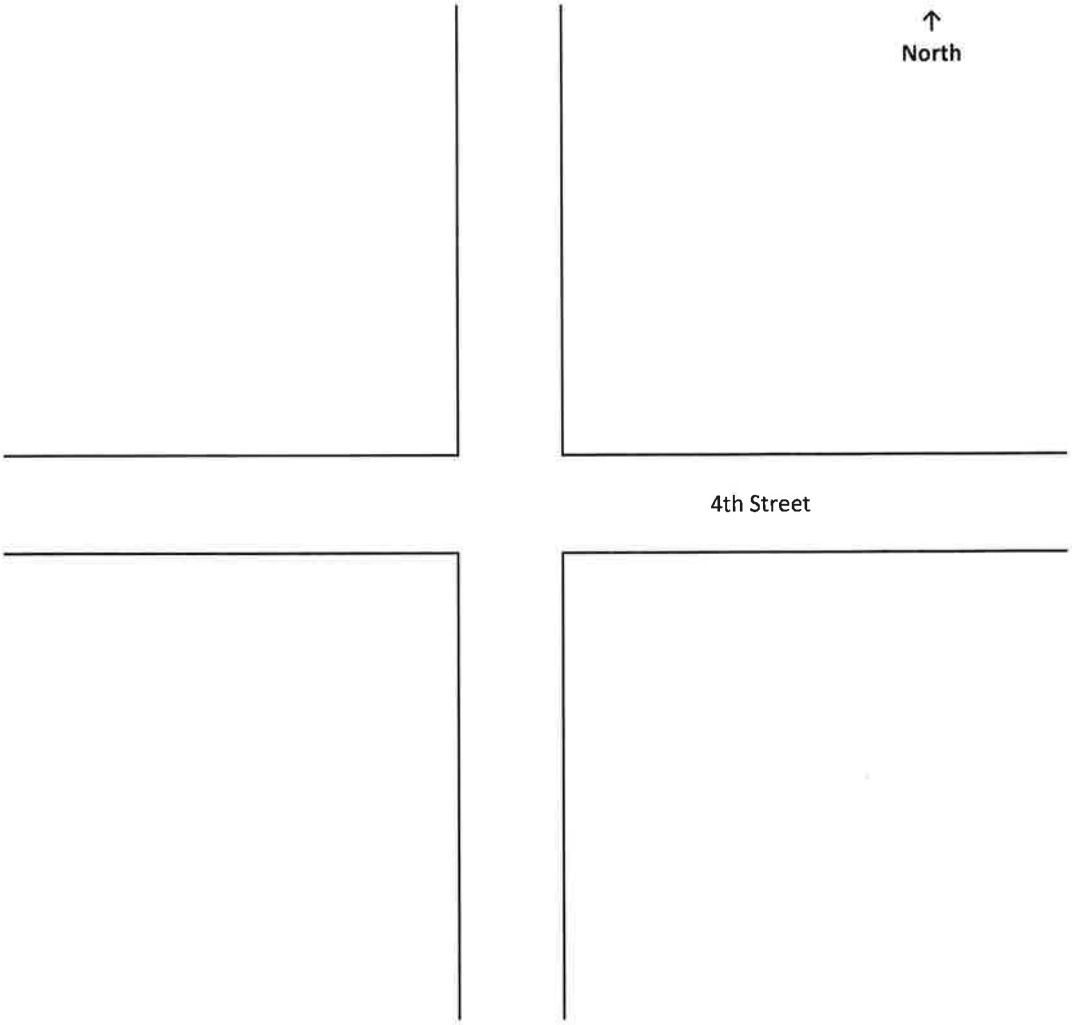
Intersection: 4th + Union

Date: 4/19/12

Name: B. Cooper

Begin Time: 8:45 am End Time: 9:00 am

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

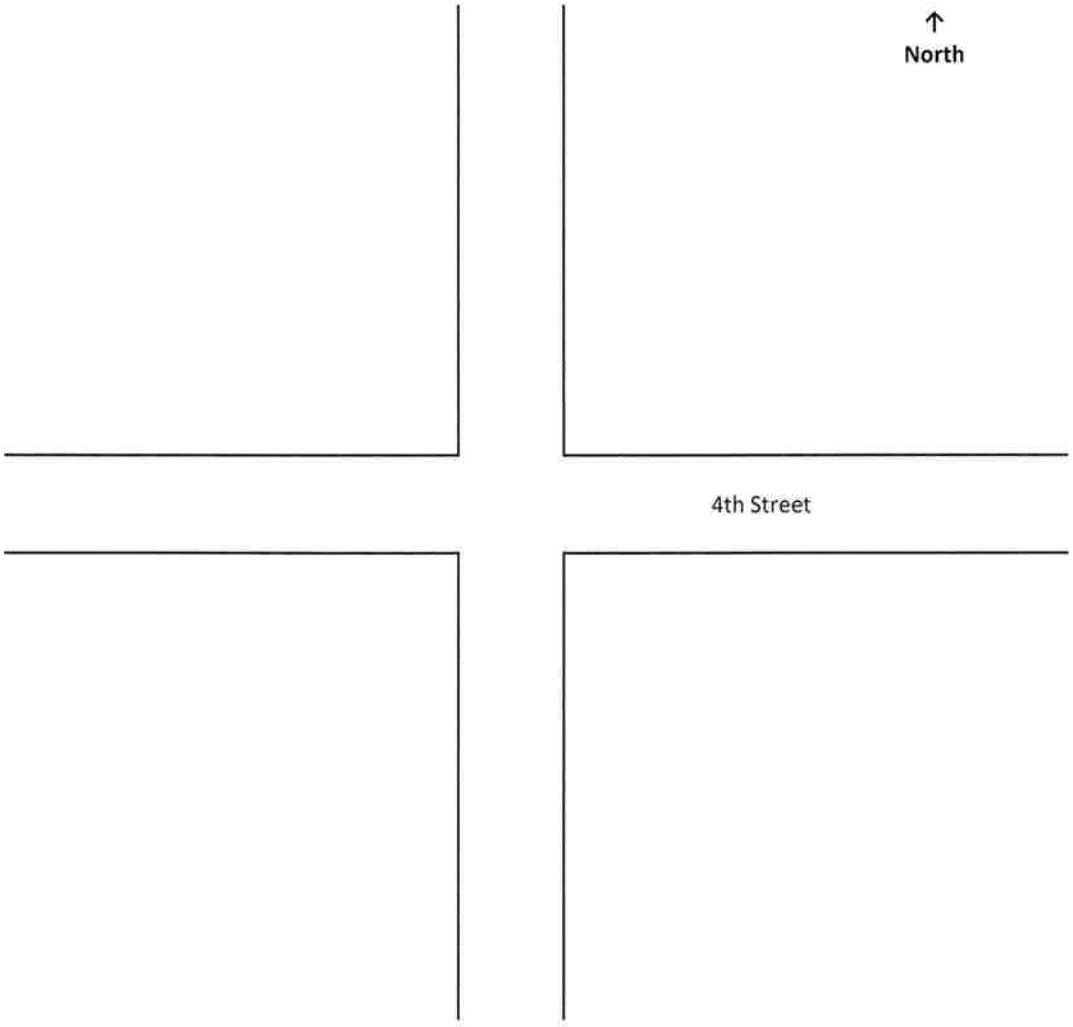
Intersection: 4th & Union

Date: 4/19/12

Name: B. Cooper

Begin Time: 2:15 pm End Time: 2:30 pm

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

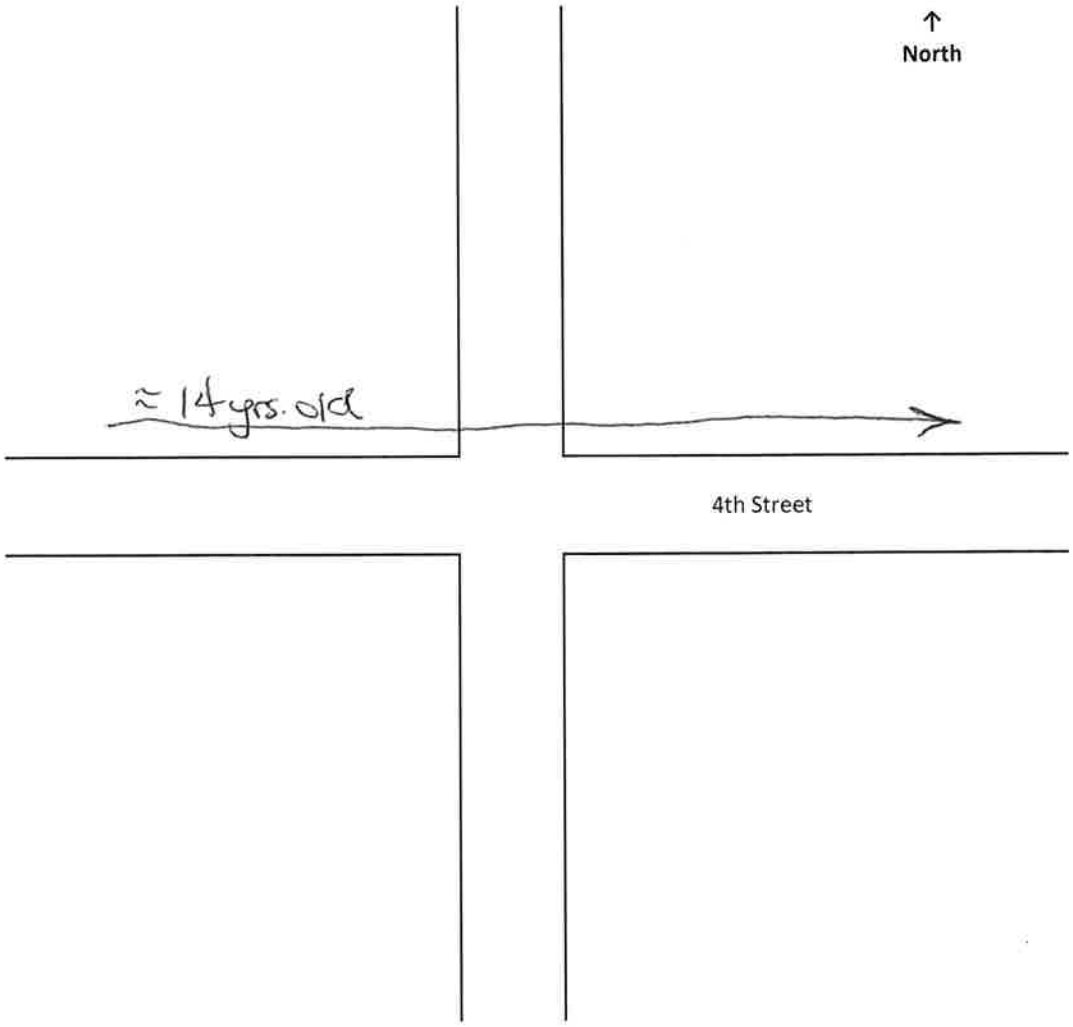
Intersection: 4th & Union

Date: 4/19/12

Name: B. Cooper

Begin Time: 2:30 pm End Time: 2:45 pm

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

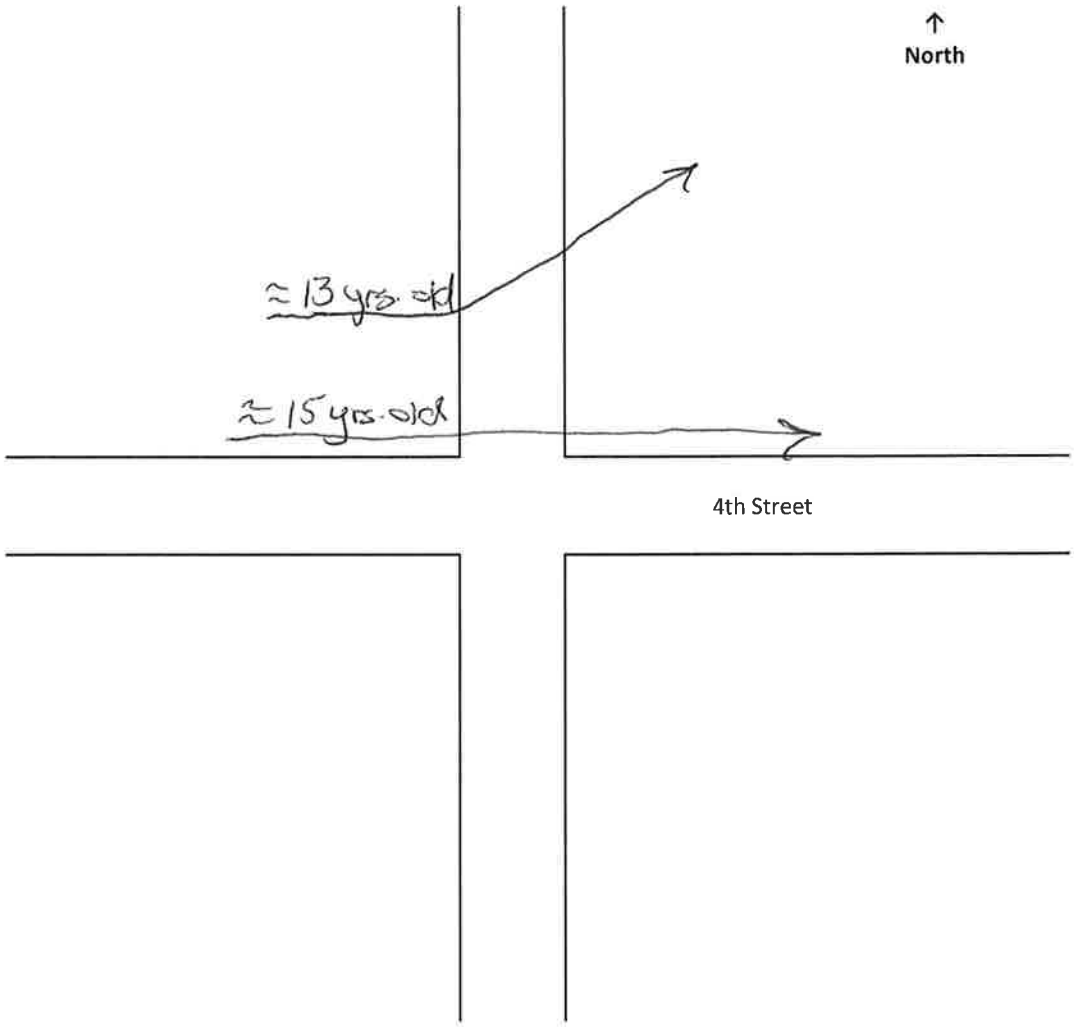
Intersection: 4th + Union

Date: 4/19/12

Name: B. Cooper

Begin Time: 2:45 pm End Time: 3:00 pm

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

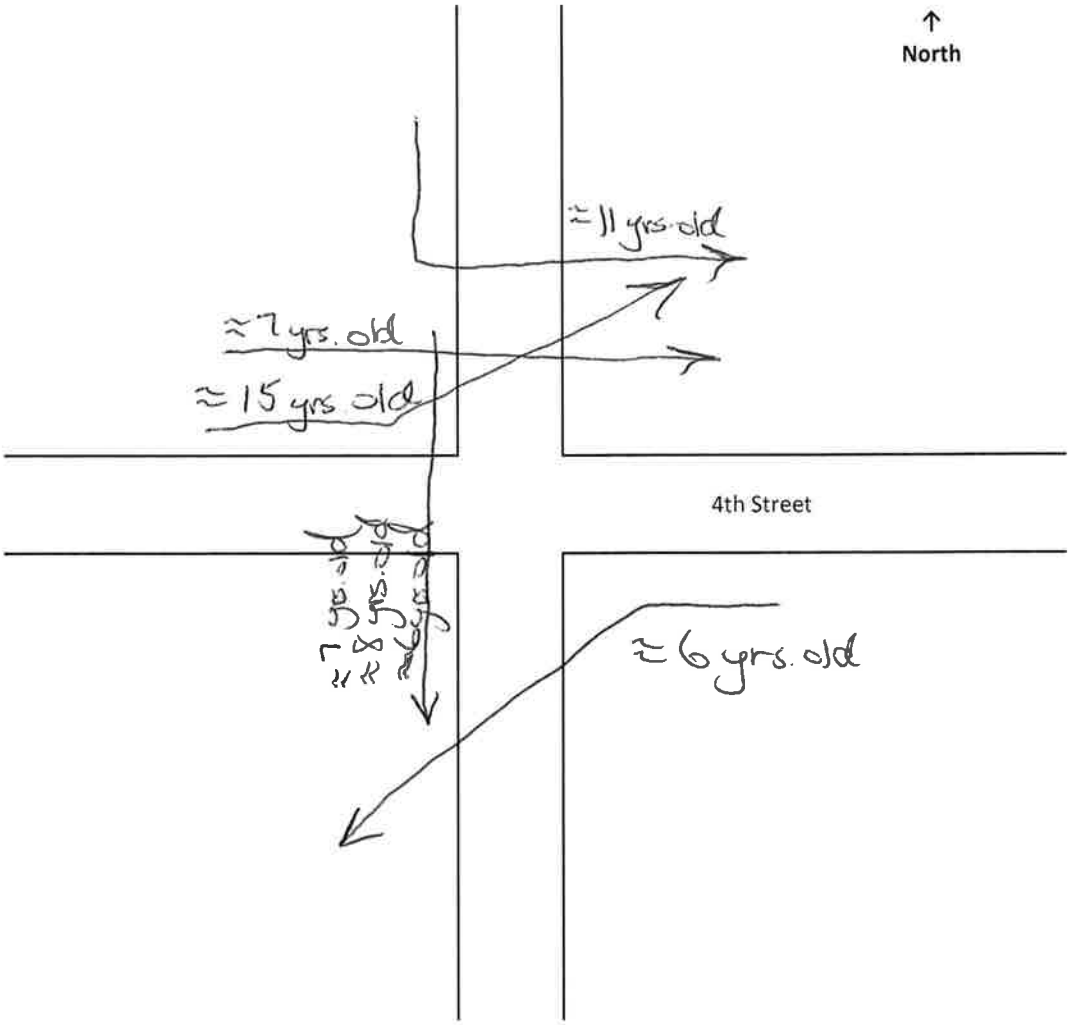
Intersection: 4th + Union

Date: 4/19/12

Name: B. Cooper

Begin Time: 3:00 pm End Time: 3:15 pm

***Start a new sheet every 15 minutes.



Notes:

Manual Intersection Counts

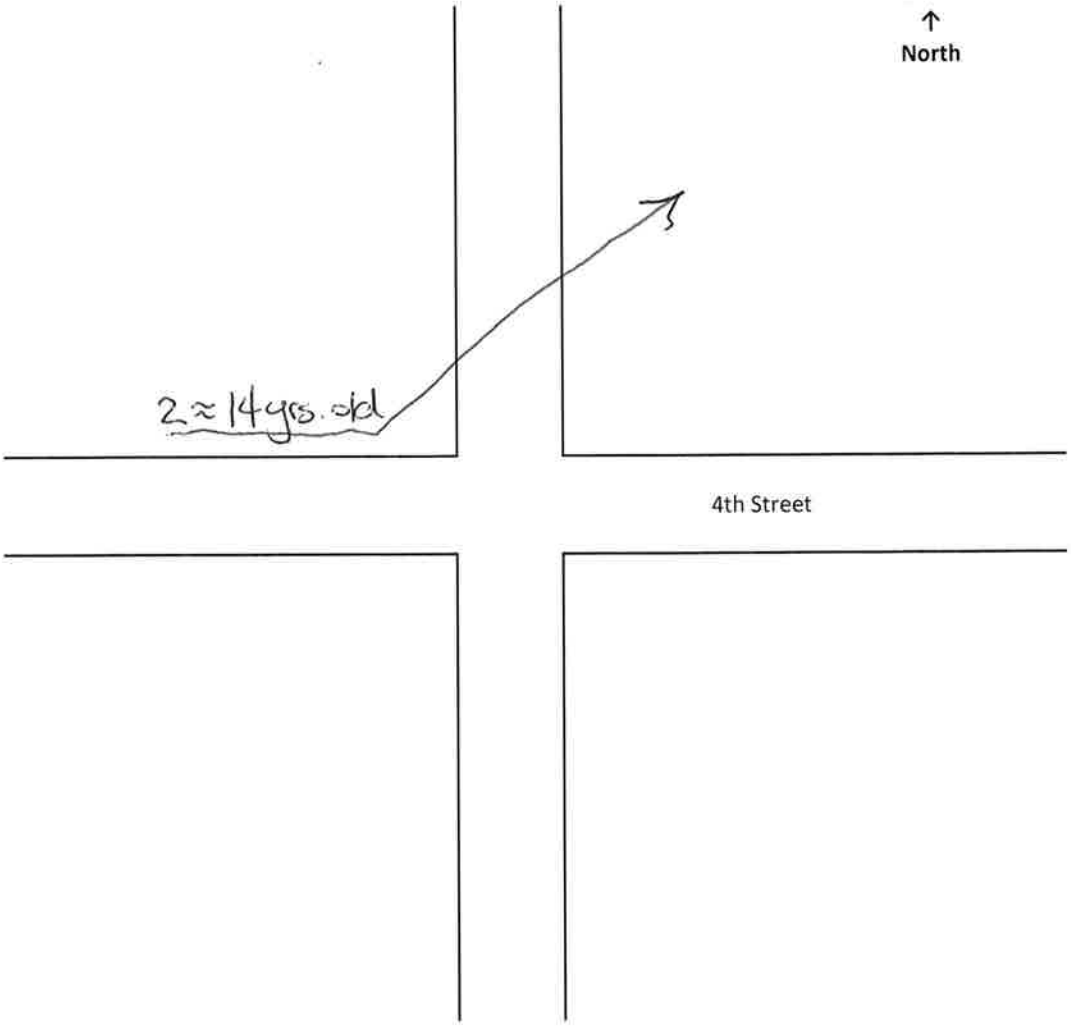
Intersection: 4th + Union

Date: 4/19/12

Name: B. Cooper

Begin Time: 3:15 pm End Time: 3:30 pm

***Start a new sheet every 15 minutes.



Notes: