Appendix A

Point Defiance Data Collection Plan

(September 2010)

Point Defiance Data Collection Plan

Objectives

- Peak Hour Turning Movement Counts
- Peak Hour Queue Lengths

Locations:	Schedule
1. Berkeley Street (3 intersections)	Sept. 21, 2010
2. Thorne Lane (3 Intersections)	Sept. 23, 2010
3. Barksdale Avenue (3 intersections)	Sept. 28, 2010
4. 41st Division Drive (2 Ramp Terminals)	Sept. 30, 2010

HDR Engineering

September 14, 2010

Sub-Consultant Contact and Vehicle Information

- Data Collection Firm: TC2, Inc.
  - Field Supervisors:

    (1) Jennifer Hodge: 360-446-0515 (Office) 360-389-7257 (Cell)

    (2) Lynne B. Phil: 425-861-8866 (Office) 206-300-6085 (Cell)
  - List of Surveyors/Substitutes:

Last Name	First Name	Middle Name	Date of Birth
Pihl	Lynne	B.	8/2/47
Pihl	James	M.	5/29/43
Alexander	Valerie	J.	1/6/54
Alexander	Richard	M.	12/16/50
Hodge	Jennifer	L.	9/11/1981

  - Vehicle Information:

Make	Model	Color	Plate Number	State of Issue
Ford	Escape	Silver	282YXC	WA
Chevrolet	Silverado	Green	B02312D	WA
Hyundai	Tucson	Blue-ish	847UUQ	WA

HDR Contact and Vehicle Information

- Supervisors:

  (1) Buzz Berger: 425-468-1547 (Office), 206-919-4177 (Cell)

  (2) Tony Wang: 425-450-6295 (Office),201-349-1915 (Cell)

- List of Surveyors/Substitutes:

Last Name	First Name	Middle Name	Date of Birth
McKnight	Gregory (Greg)	A.	01/03/1984
Nagamatsu	Mark	A.	09/29/1970
Wang	Hua (Tony)	N/A	12/30/1974
Rahman	Mohammad (Aziz)	Azizur	12/31/1976
Huynh	Tony	N/A	07/18/1976

- Company and Personal Vehicle Information:

Make	Model	Color	Plate Number	State of Issue
Toyota	Prius	Tan	ZDA	WA
Ford	Escape-Hybrid	White	B56330L	WA
Dodge	Caravan	Maroon	486RZP	WA
Acura	integra	Black		WA
Nissan	Xterra	True Blue	TXC-110	WA

Deliverables

- All videos. (8 cameras, 8 hours at each location)
- Turning movement counts summary (TC2 standard)
- Intersection Configuration Sheet (Lane with numbers that match with manual queue length observation sheets.
- Manual Queue Length Study should deliver raw (hand-writing) sheets and a data Summary in Excel.
- Video observation summary of queue length estimation on ramps and sections between intersections.

Berkeley Street Data Collection Plan

Berkeley Street (3 intersections)

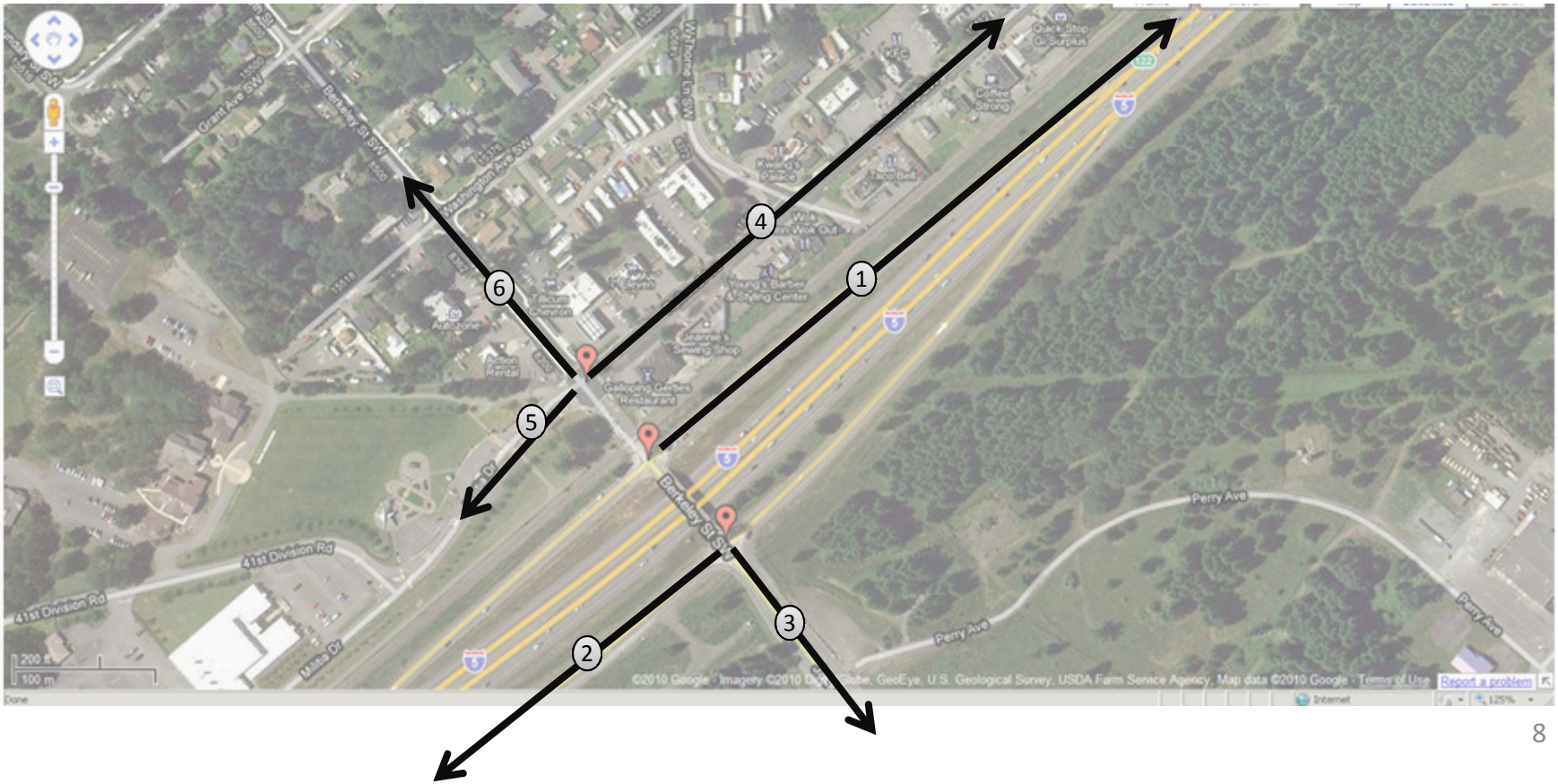
1. Berkeley Street and Union Avenue
2. Berkeley Street and I-5 SB Ramp Terminal
3. Berkeley Street and I-5 NB Ramp Terminal

Berkeley Street Turning Movement Counts

- 3 intersections, 3 Data Collection Units (DCU), 8 hours at each intersection
- AM Peak Period (5:00-9:00) 4 hours
- Lunch/NN Peak Period (11:00-13:00) 2 hours
- PM Peak Period (16:00-18:00) 2 hours
- One DCU camera view should cover the short section between intersection #1 and intersection #2 (for queue length)
- One DCU camera view should cover the bridge section between intersection #2 and intersection #3 (for queue length)
- Camera should NOT be pointed towards the base (gate).

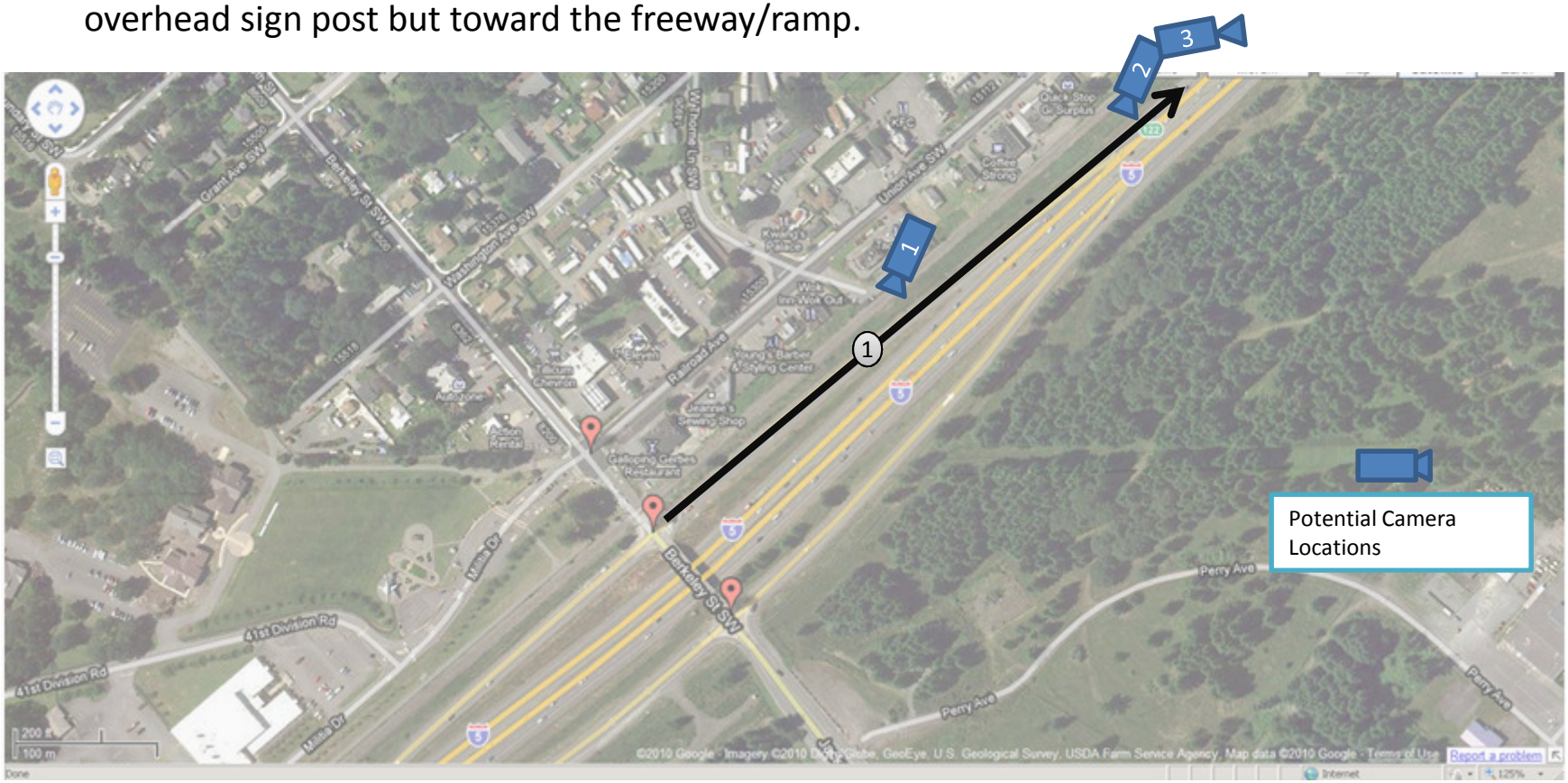
Berkeley Street Queue Length Study

- 6 approaches (on the figure) , 5 Data Collection Units (DCU), 2 persons. 4 hours at each approaches
- AM Peak Period (5:30-6:30) and (7:00-8:00) 2 hours
- Lunch/NN Peak Period (11:30-12:30) 1 hour
- PM Peak Period (16:30-17:30) 1 hour
- One camera view should cover the short section between intersection #1 and intersection #2 (for queue length)
- One camera view should cover the bridge section between intersection #2 and intersection #3 (for queue length)
- Camera should NOT be pointed towards the base (gate).



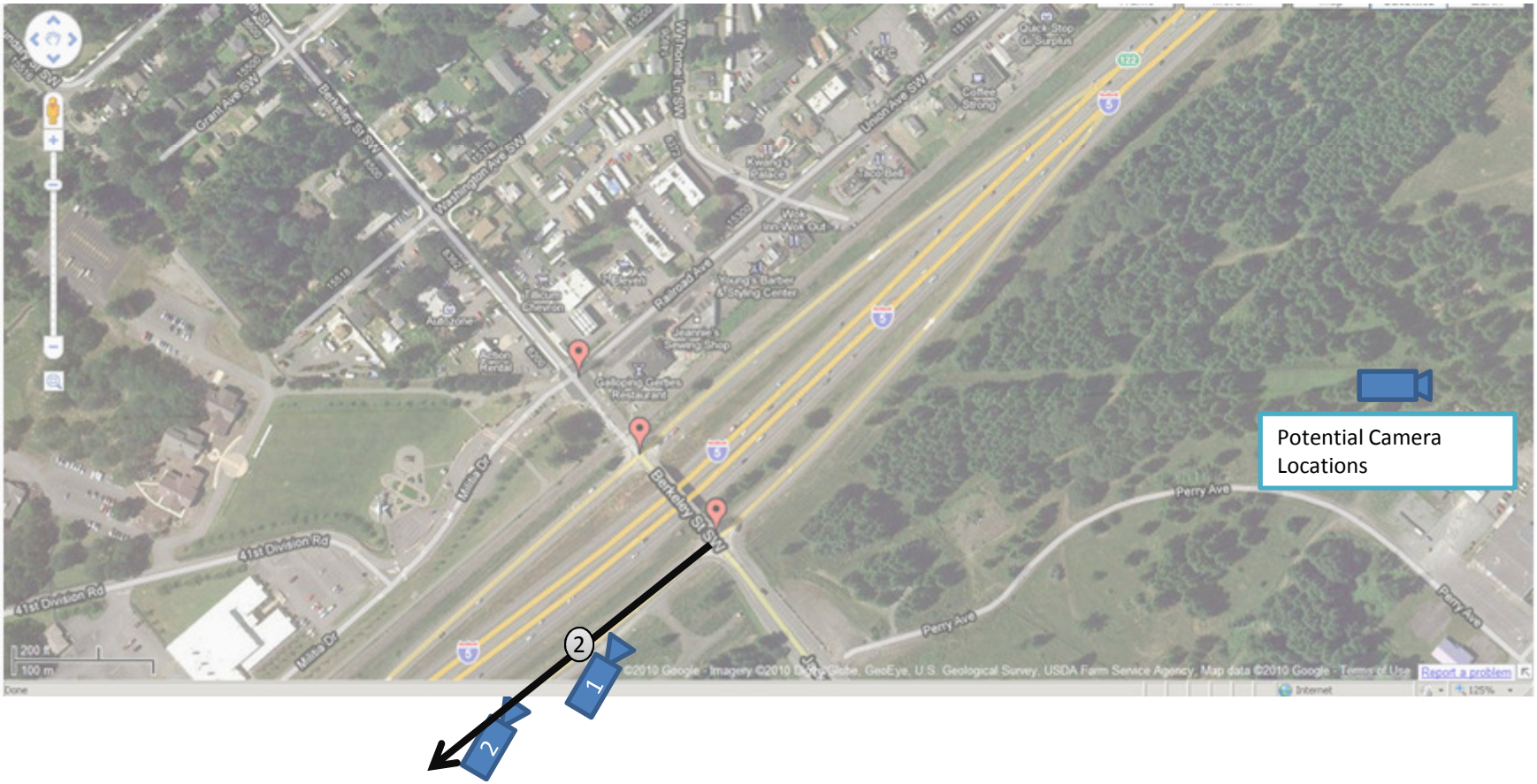
Approach 1 Queue Length Study

- Approach 1: This ramp has long queue in the morning (6:00-6:30). It can be longer than the ramp length. It needs 3 cameras. One camera for shorter queue with a DCU attached to light post). One camera for longer queue with a DCU attached to a overhead sign post approaching this ramp. One camera for super long queue with DCU attached to the same overhead sign post but toward the freeway/ramp.



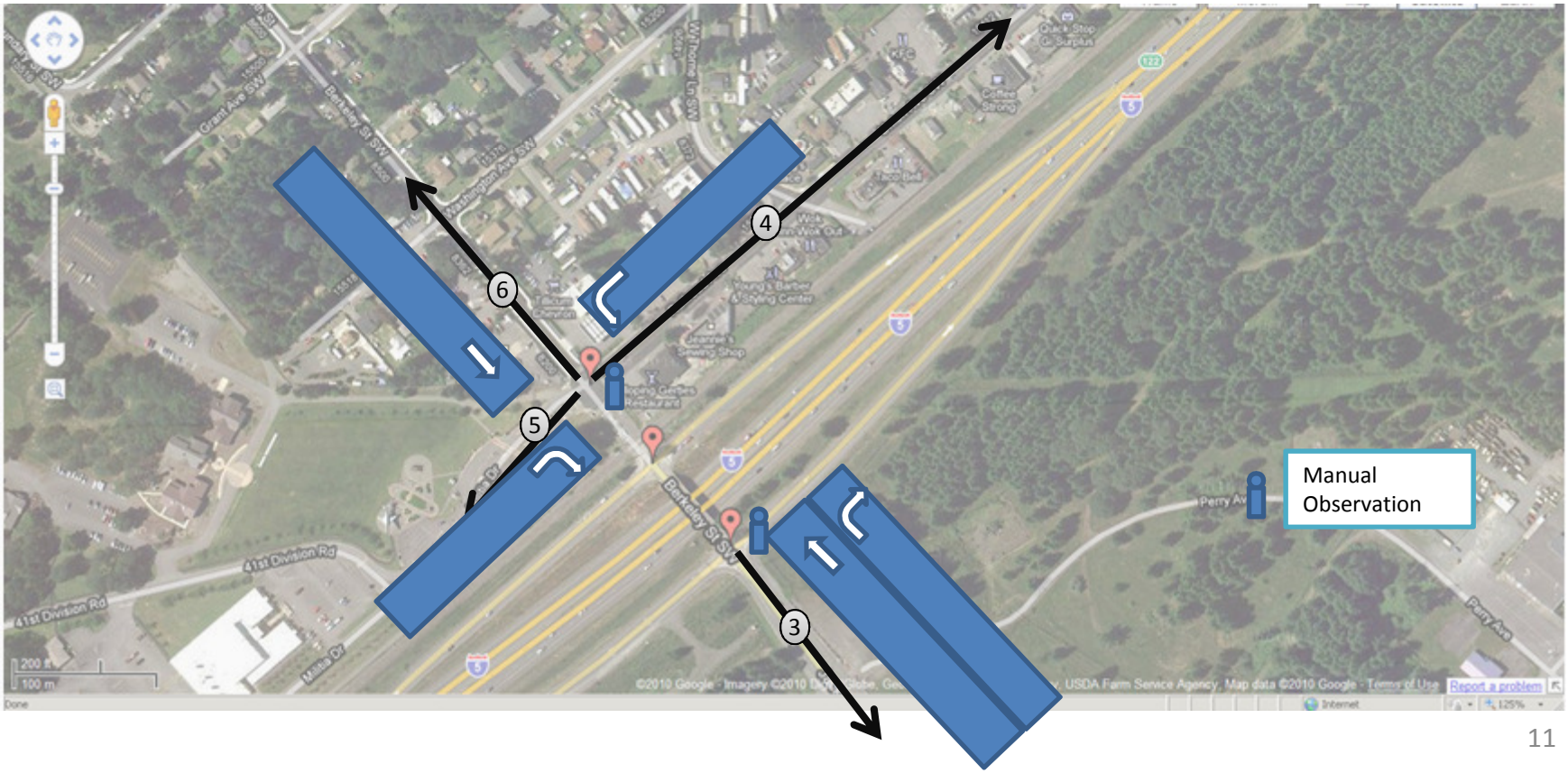
Approach 2 Queue Length Study

- Approach 2: This ramp has long queue in the morning (6:00-6:30). It can be longer than the ramp length. It needs 2 cameras. One camera for shorter queue with a DCU attached to light post). One camera for longer queue with a DCU attached to a overhead sign post approaching this ramp.



Approach 3 through 6 Queue Length Study

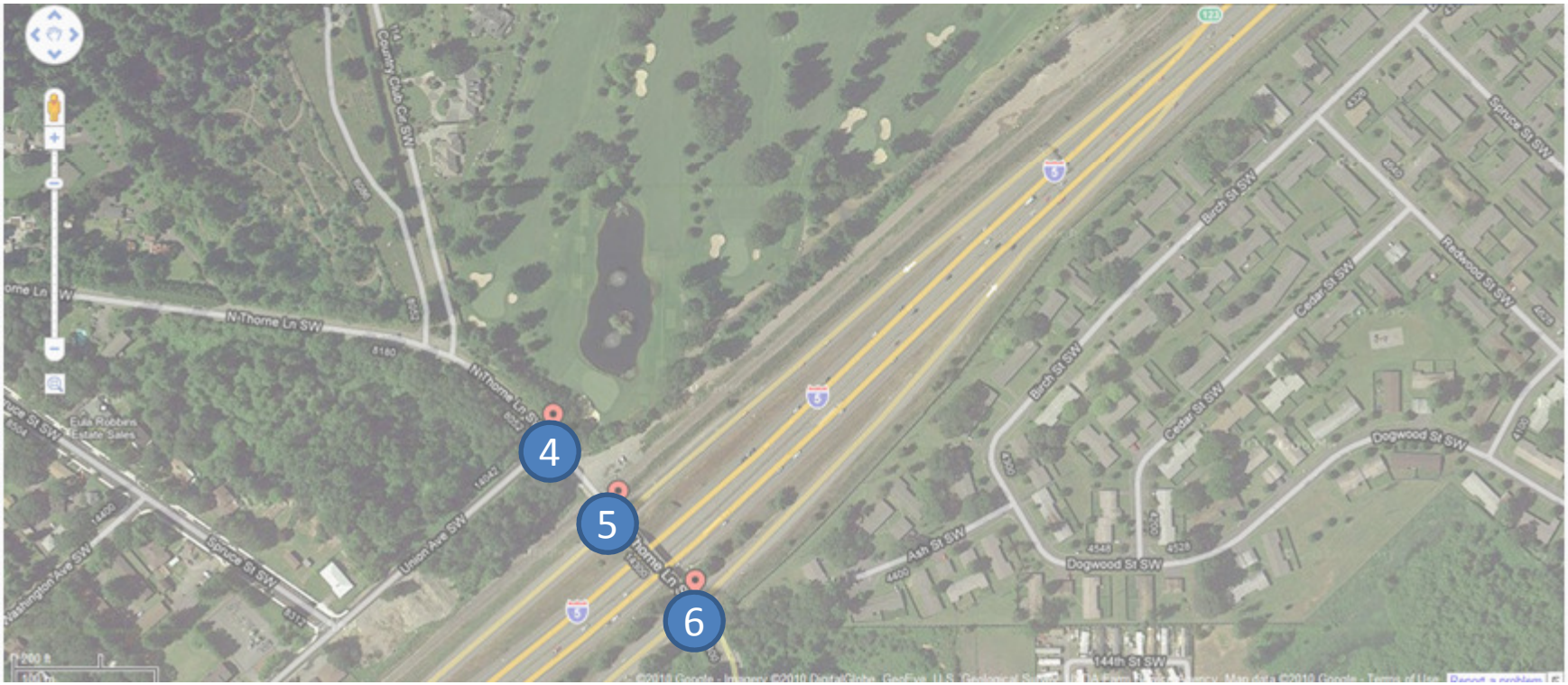
- Approach 3- Manual observations at the beginning of green signal of each cycle and count the vehicles in the queue and slowly joining queue. (# of vehicles – through lane and right turning lane separately) (one person) . **Please position personnel so you will minimize impact to the signal during data collection.**
- Approach 4,5 and, 6 - Manual observations every 2 minute. (# of vehicles – stopped at approaches) (one person)



Thorne Lane Data Collection Plan

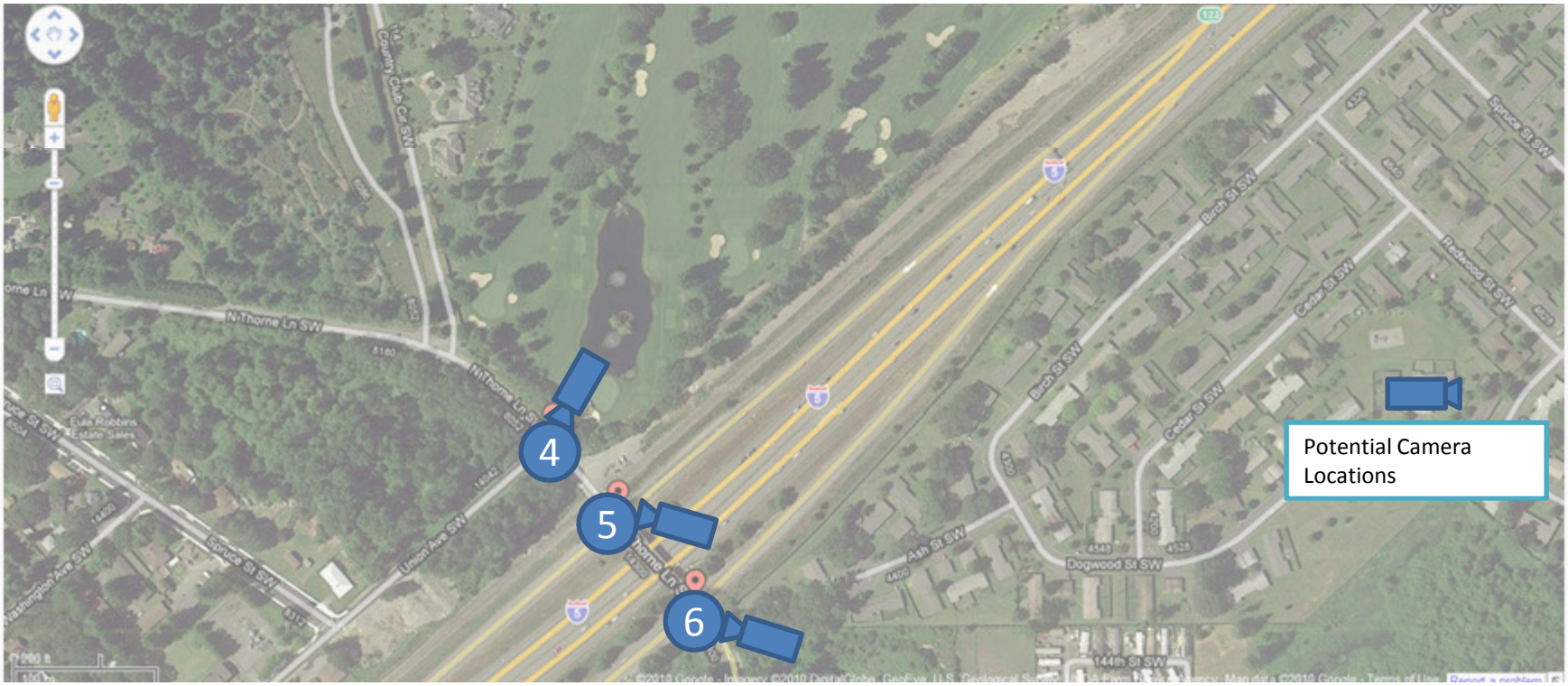
Thorne Lane (3 intersections)

4. Thorne Lane and Union Avenue
5. Thorne Lane and I-5 SB Ramp Terminal
6. Thorne Lane and I-5 NB Ramp Terminal



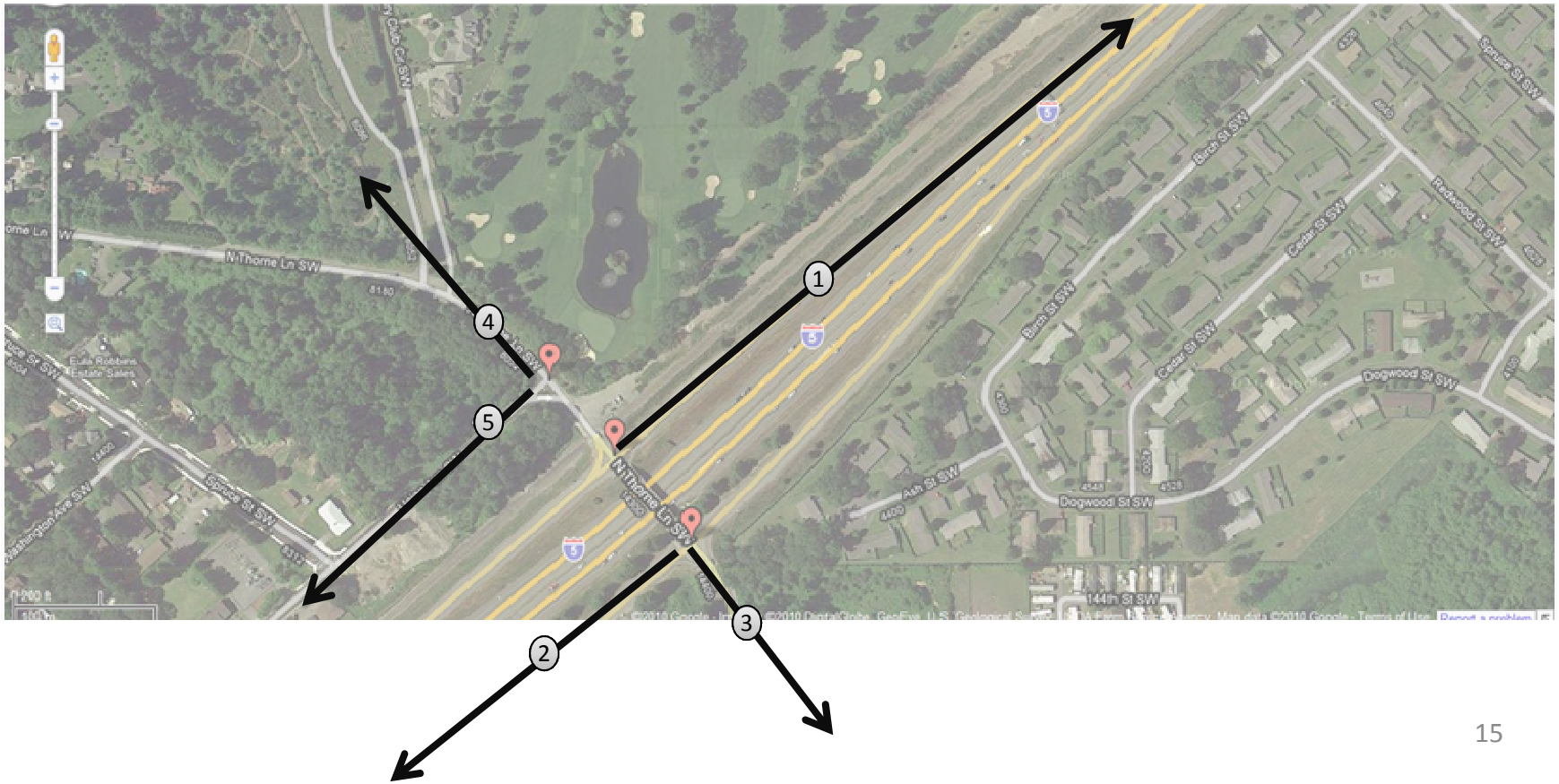
Thorne Lane Turning Movement Counts

- 3 intersections, 3 Data Collection Units (DCU) , 8 hours at each intersection
- AM Peak Period (5:00-9:00) 4 hours
- Lunch/NN Peak Period (11:00-13:00) 2 hours
- PM Peak Period (16:00-18:00) 2 hours
- One DCU camera view should cover the short section between intersection #1 and intersection #2 (for queue length)
- One DCU camera view should cover the bridge section between intersection #2 and intersection #3 (for queue length)
- Camera should NOT be pointed towards the base (gate).



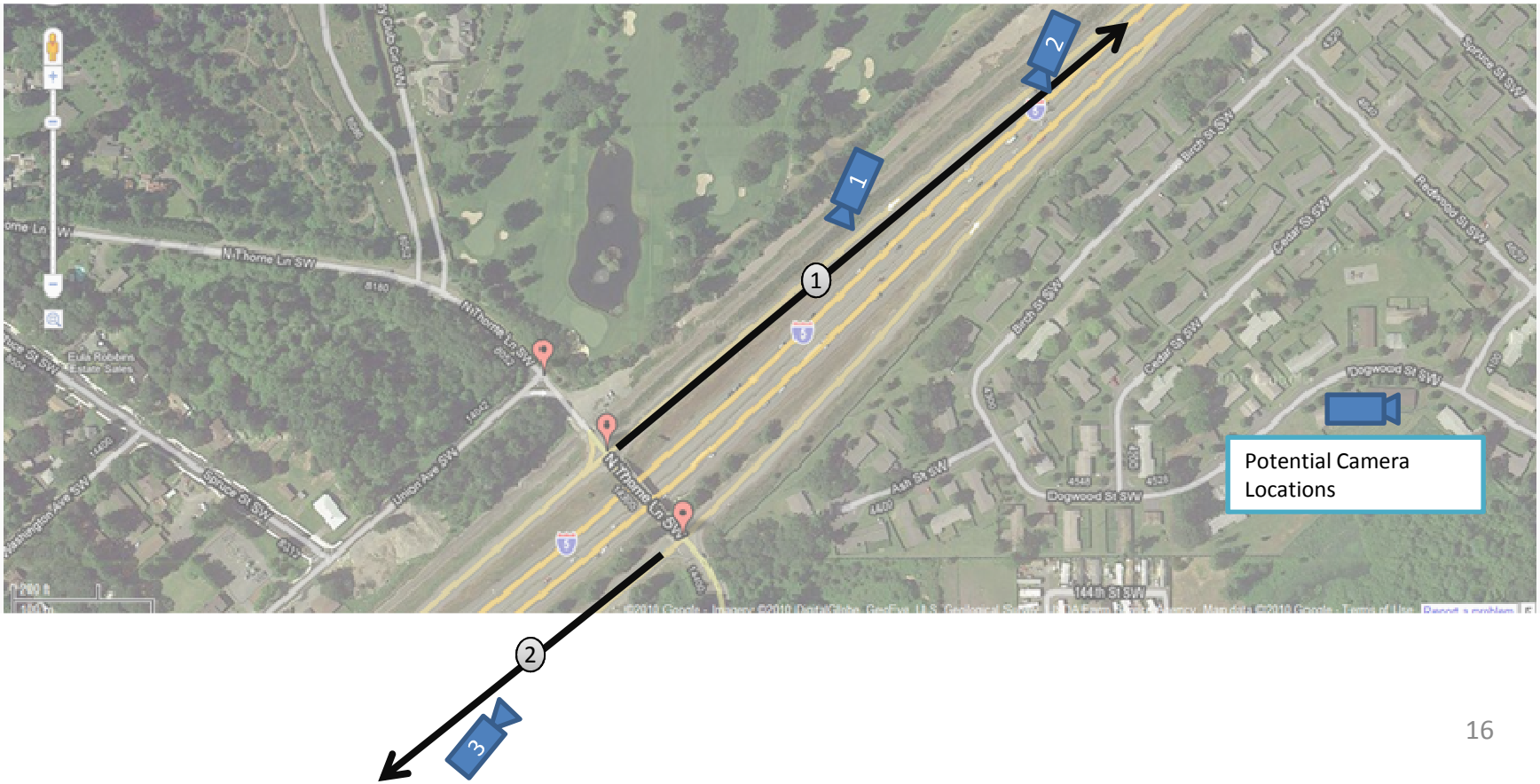
Thorne Lane Queue Length Study

- 5 approaches (on the figure) , 5 Data Collection Units (DCU), 2 persons. 4 hours at each approaches
- AM Peak Period (5:30-6:30) and (7:00-8:00) 2 hours
- Lunch/NN Peak Period (11:30-12:30) 1 hour
- PM Peak Period (16:30-17:30) 1 hour
- One camera view should cover the short section between intersection #1 and intersection #2 (for queue length)
- One camera view should cover the bridge section between intersection #2 and intersection #3 (for queue length)
- Camera should NOT be pointed towards the base (gate).



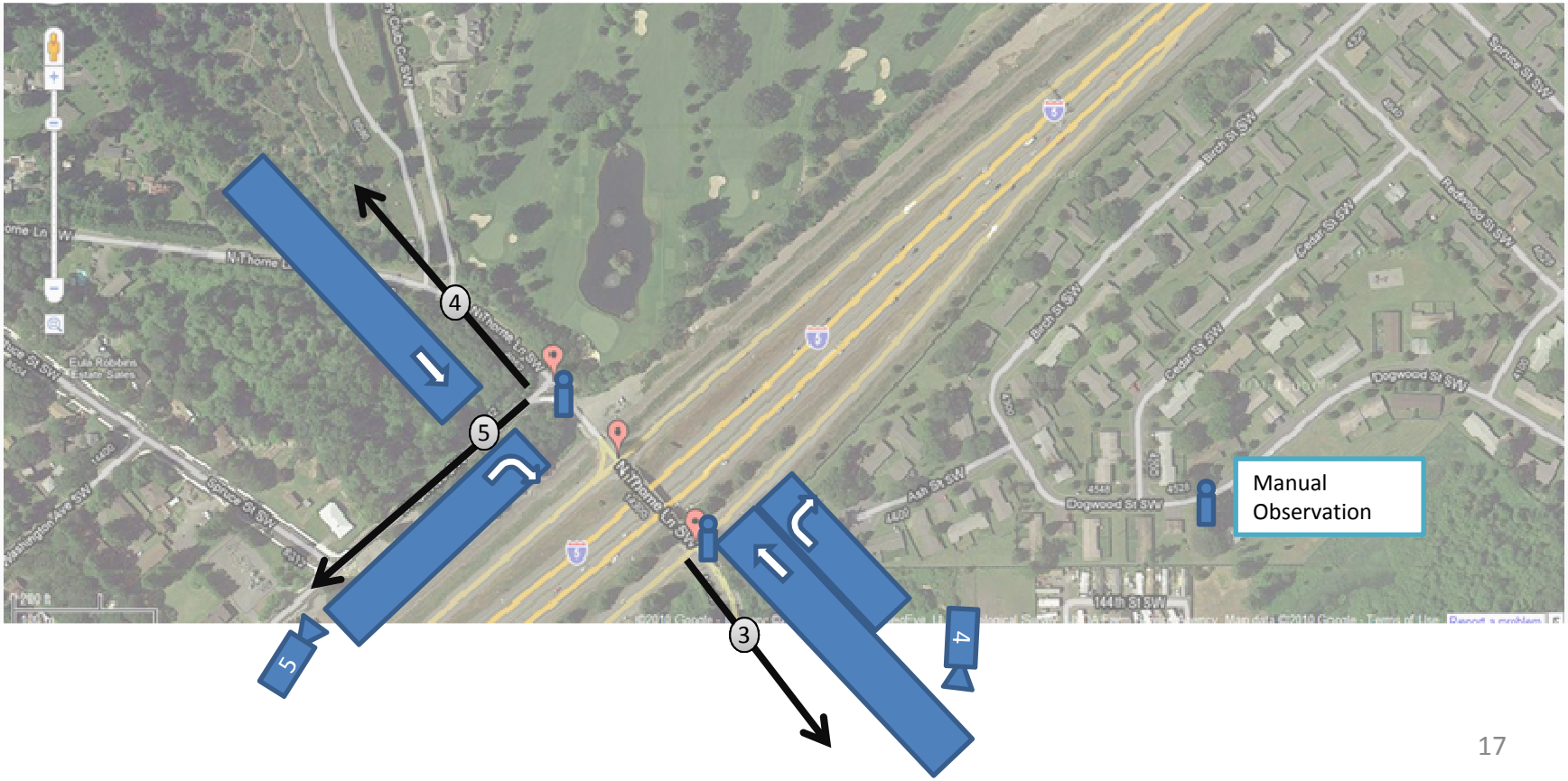
Approach 1 and 2 Queue Length Study

- Approach 1: This ramp has medium queue. It should be ok to use two camera.
- Approach 2: This ramp has medium queue. It should be ok to use one camera.



Approach 3 through 5 Queue Length Study

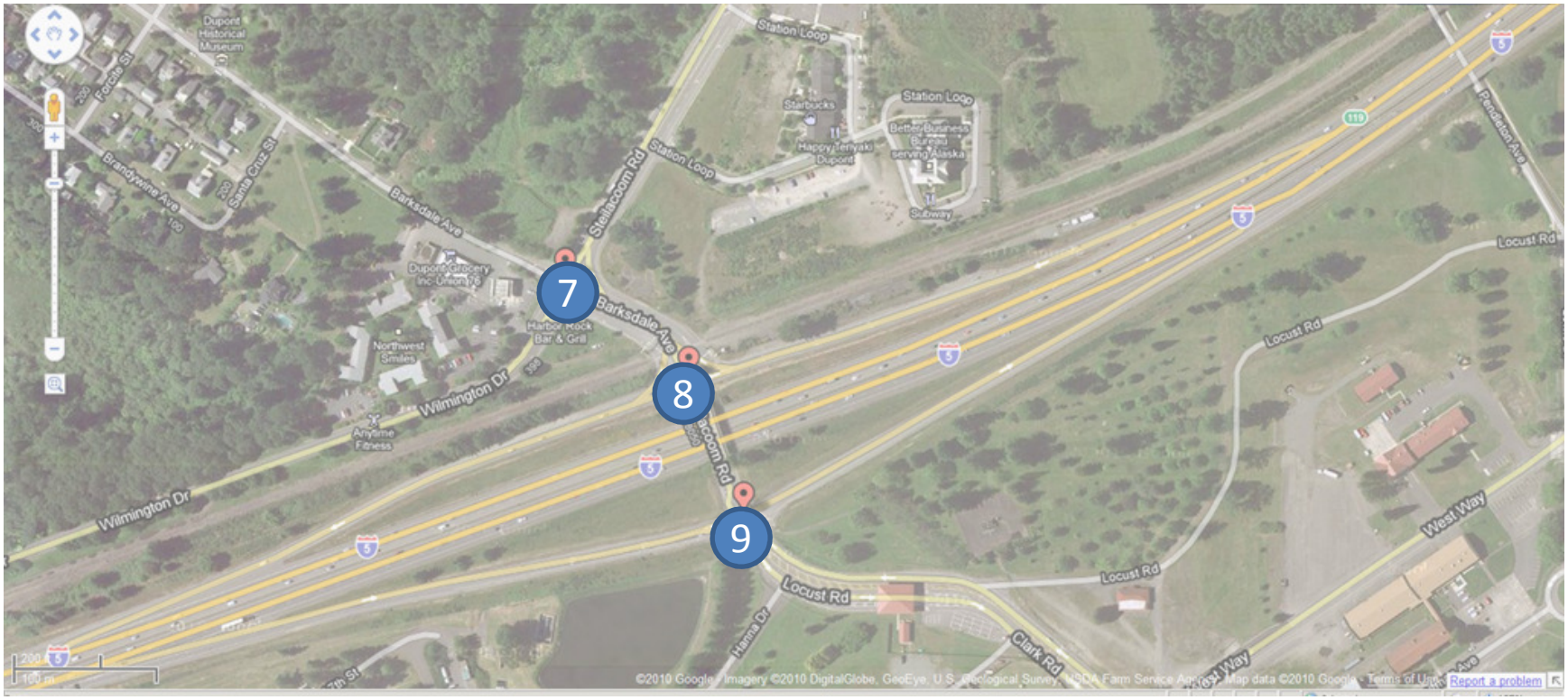
- Approach 3- Manual observations at the beginning of green signal of each cycle and count the vehicles in the queue and slowly joining queue. (# of vehicles – through lane and right turning lane separately) (one person) . **Please position personnel so you will minimize impact to the signal during data collection.**
- **Approach 3 is on a curve.** Camera 4 is used to supplement the queue information
- Approach 4 and 5- Manual observations every 2 minute. (# of vehicles – stopped at approaches) (one person)
- Approach 5 has long queue. Camera 5 is used to supplement the queue information.



Barksdale Avenue Data Collection Plan

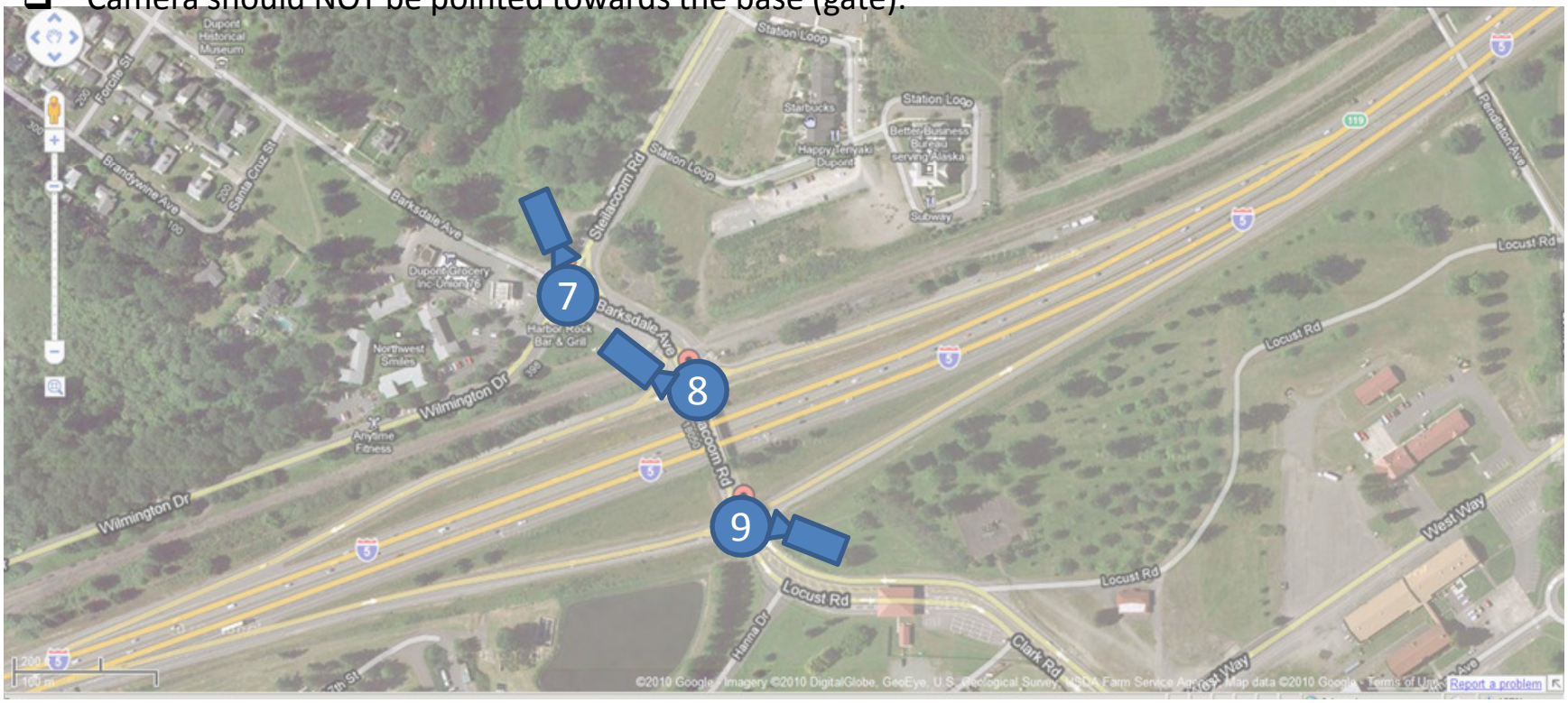
Barksdale Avenue(3 intersections)

7. Barksdale Avenue and Steilacoom Road
8. Barksdale Avenue and I-5 SB Ramp Terminal
9. Barksdale Avenue and I-5 NB Ramp Terminal



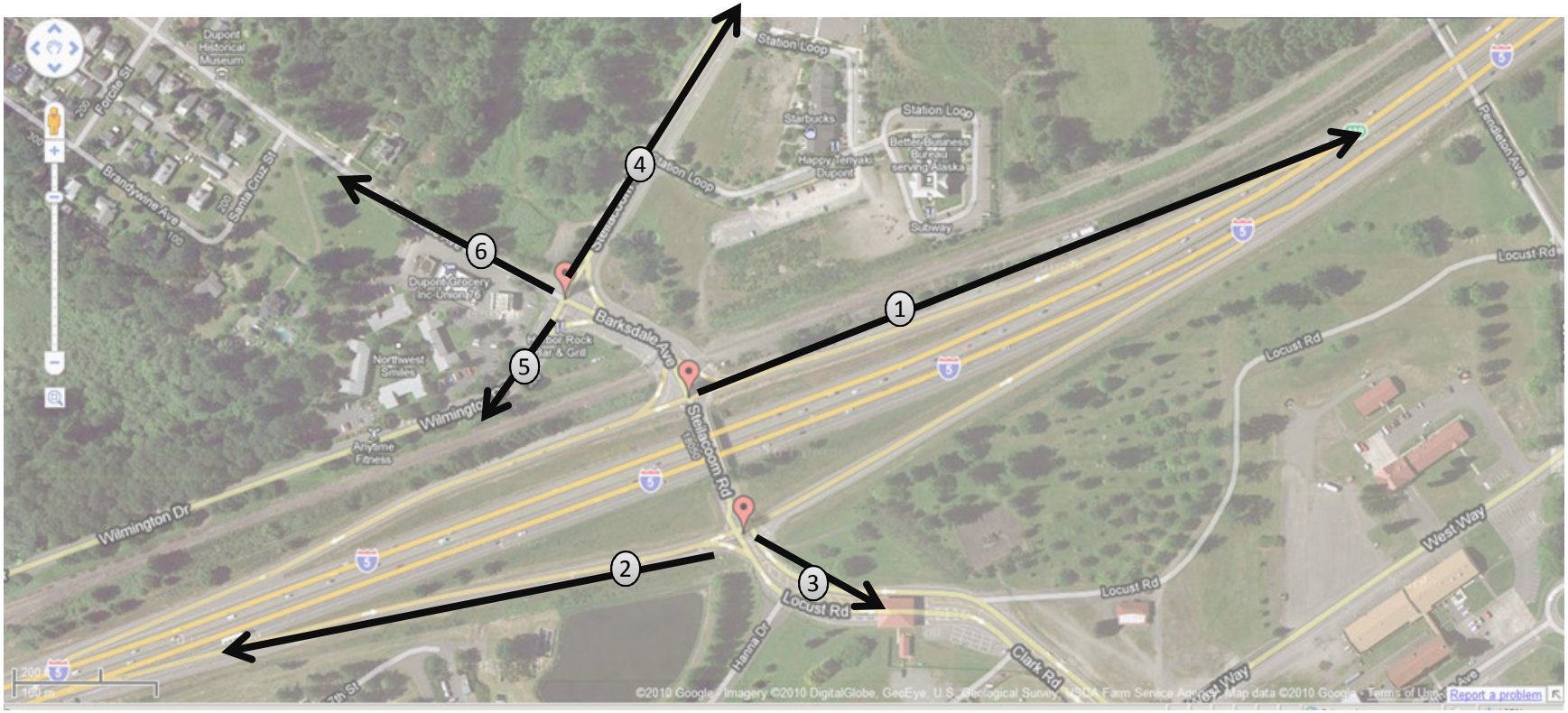
Barksdale Avenue Turning Movement Counts

- 3 intersections, 3 Data Collection Units (DCU),, 8 hours at each intersection
- AM Peak Period (5:00-9:00) 4 hours
- Lunch/NN Peak Period (11:00-13:00) 2 hours
- PM Peak Period (16:00-18:00) 2 hours
- One DCU camera view should cover the short section between intersection #1 and intersection #2 (for queue length)
- One DCU camera view should cover the bridge section between intersection #2 and intersection #3 (for queue length)
- Camera should NOT be pointed towards the base (gate).



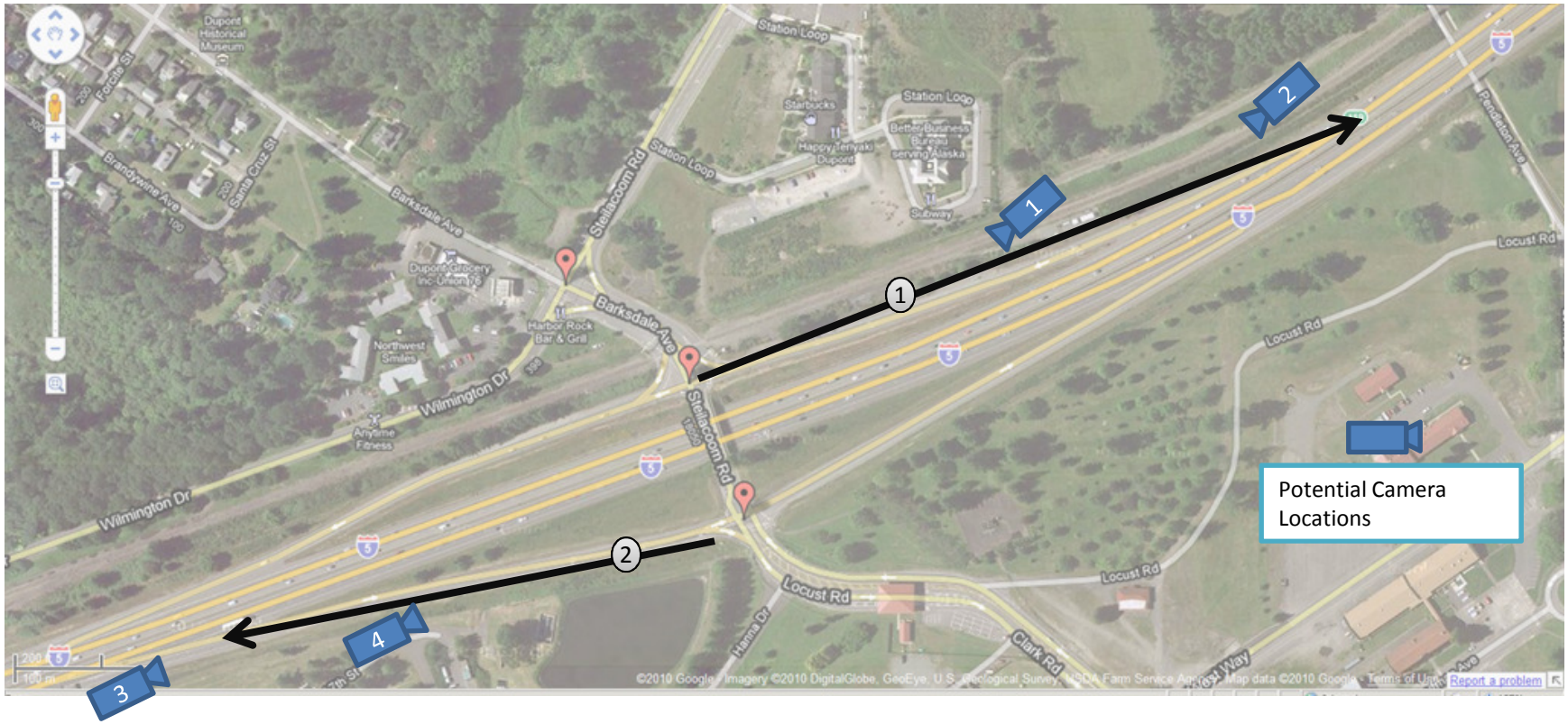
Barksdale Avenue Queue Length Study

- 6 approaches (on the figure) , 5 Data Collection Units (DCU), 2 persons. 4 hours at each approaches
- AM Peak Period (5:30-6:30) and (7:00-8:00) 2 hours
- Lunch/NN Peak Period (11:30-12:30) 1 hour
- PM Peak Period (16:30-17:30) 1 hour
- One camera view should cover the short section between intersection #1 and intersection #2 (for queue length)
- One camera view should cover the bridge section between intersection #2 and intersection #3 (for queue length)
- Camera should NOT be pointed towards the base (gate).



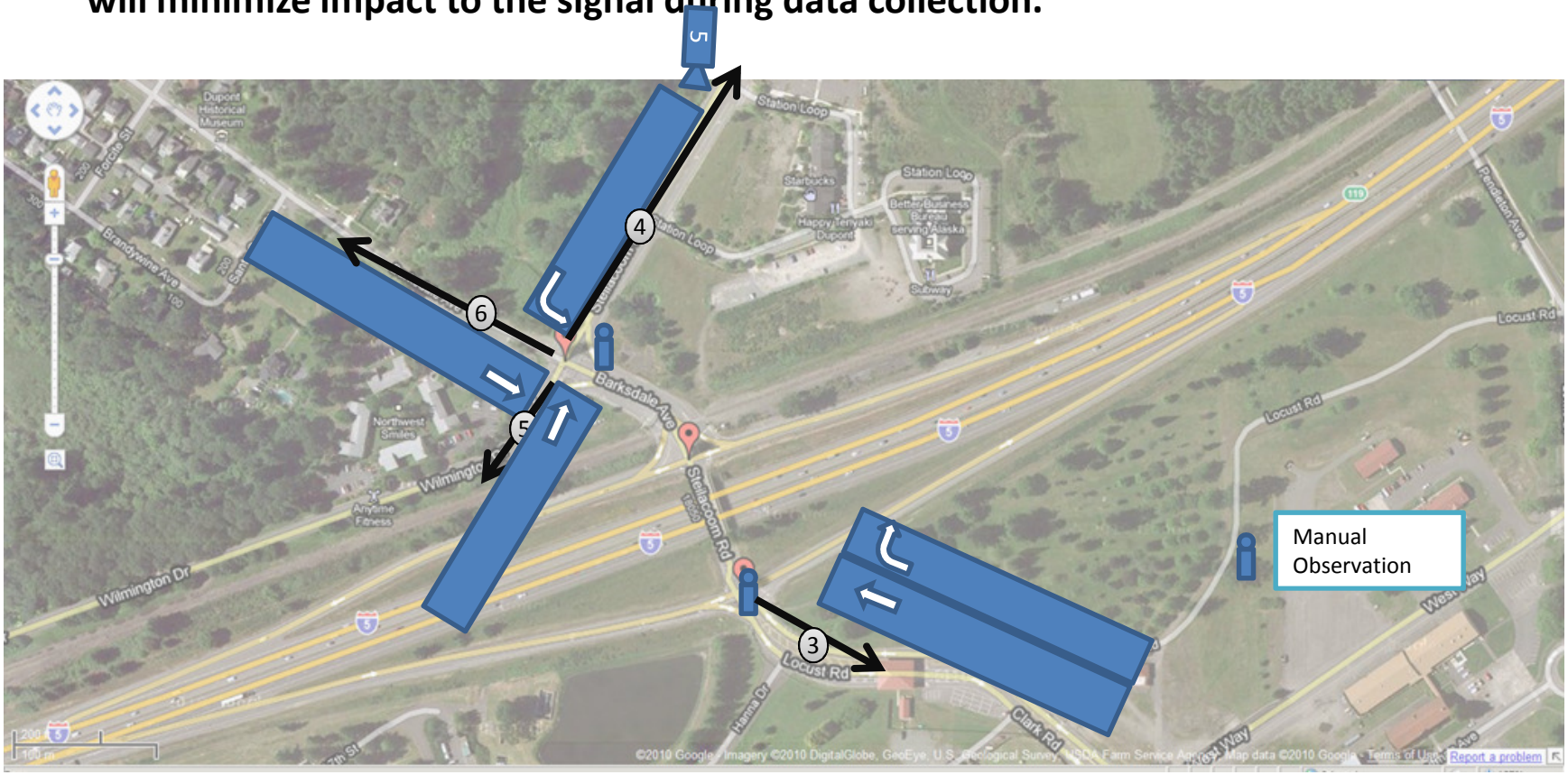
Approach 1 and 2 Queue Length Study

- Approach 1: This ramp has long queue. It should be ok to have two cameras.
- Approach 2: This ramp has long queue. It should be ok to have two cameras.



Approach 3 through 6 Queue Length Study

- Approach 3- Manual observations at the beginning of green signal of each cycle and count the vehicles in the queue and slowly joining queue. (# of vehicles – through lane and right turning lane separately) (one person) . **Please position personnel so you will minimize impact to the signal during data collection.**
- Approach 4, 5, 6- Manual observations at the beginning of green signal of each cycle and count the vehicles in the queue and slowly joining queue. (# of vehicles – through lane and right turning lane separately) (one person) . **Please position personnel so you will minimize impact to the signal during data collection.**



41st Division Drive Data Collection Plan

41st Division Drive Ramp Movement Counts

- 8 ramps, 4 DCUs, 8 hours at each location
- AM Peak Period (5:00-9:00) 4 hours
- Lunch/NN Peak Period (11:00-13:00) 2 hours
- PM Peak Period (16:00-18:00) 2 hours
- Camera should NOT be pointed towards the gates.