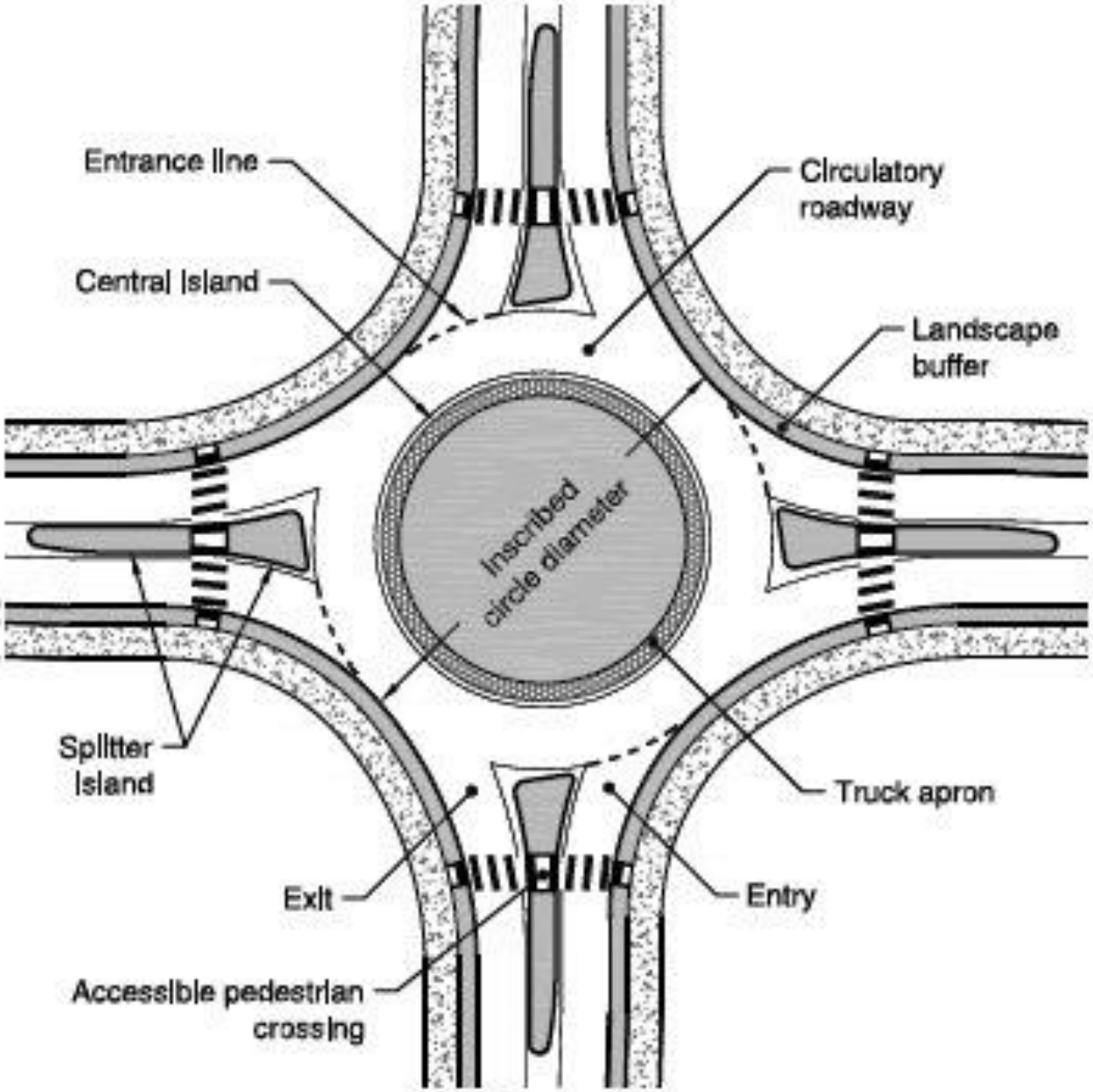
CE 572 – Spring 2015

Intersection Traffic Operations

Class 10

9 February 2015


Entrance line
Circulatory roadway
Central island
Landscape buffer
Inscribed circle diameter
Splitter island
Truck apron
Exit
Entry
Accessible pedestrian crossing


WEST
Bremerton
EAST
ROUNDABOUT
AHEAD
10
M.P.H.

(a) Traffic control

Yield control is used on all entries. The circulatory roadway has no control. *Santa Barbara, CA*

Some traffic circles use stop control, or no control, on one or more entries. *Hagerstown, MD*

(b) Priority to circulating vehicles

Circulating vehicles have the right-of-way. *Santa Barbara, CA*

Some traffic circles require circulating traffic to yield to entering traffic. *Sarasota, FL*

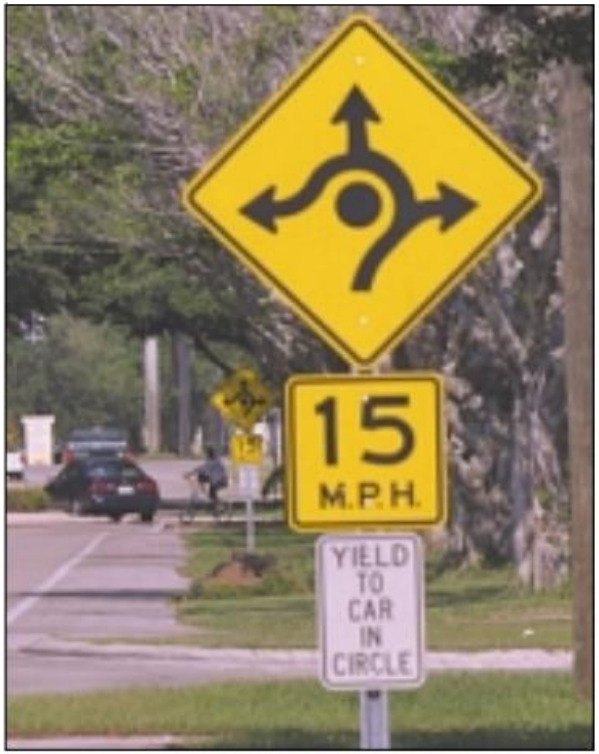
(c) Pedestrian access
Pedestrian access is allowed only across the legs of the roundabout, behind the yield line. *Santa Barbara, CA*

Some traffic circles allow pedestrian access to the central island. *Sarasota, FL*

(d) Parking
No parking is allowed within the circulatory roadway or at the entries. *Avon, CO*

Some traffic circles allow parking within the circulatory roadway. *Sarasota, FL*

Roundabouts

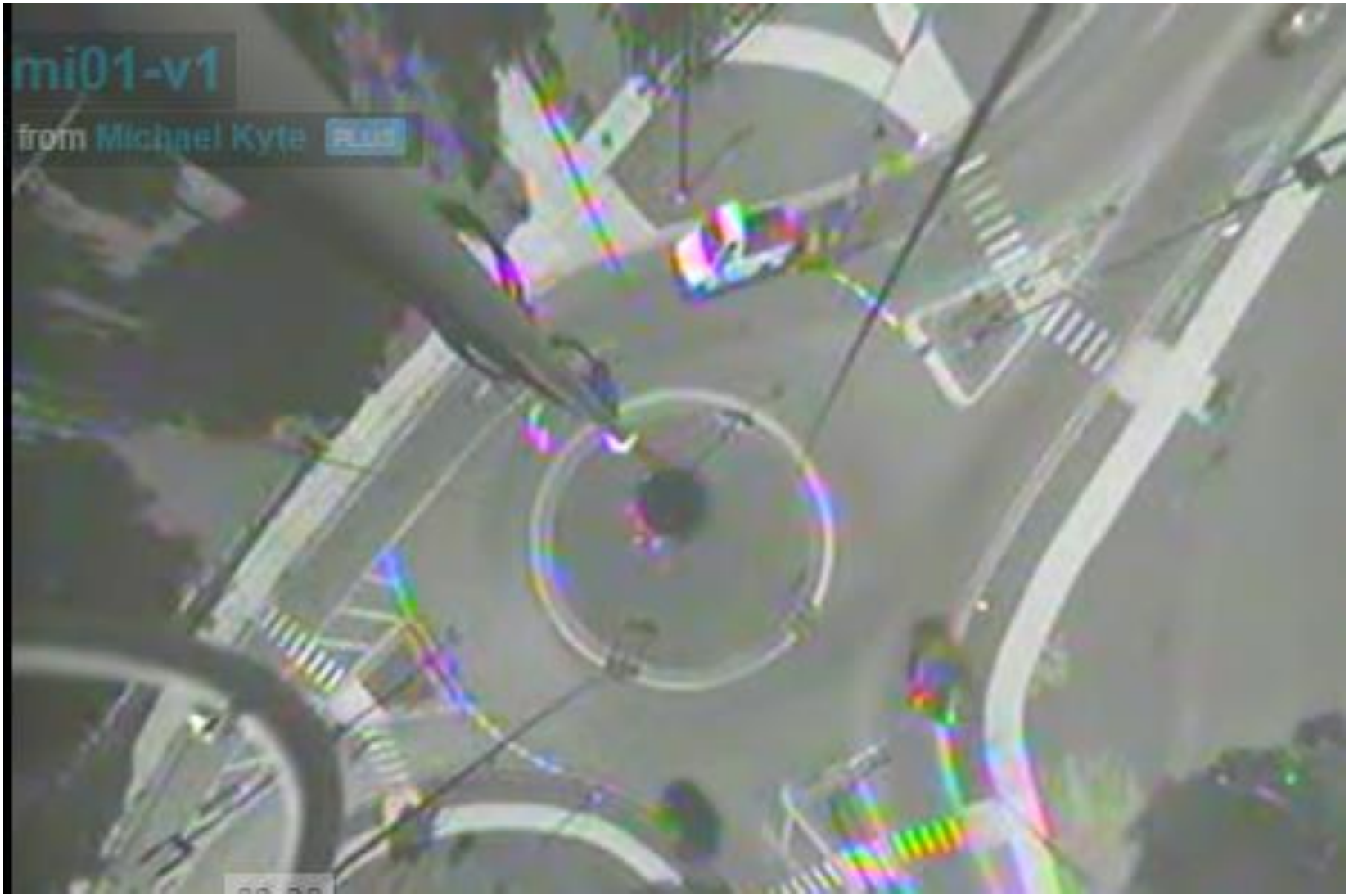


(e) Direction of circulation

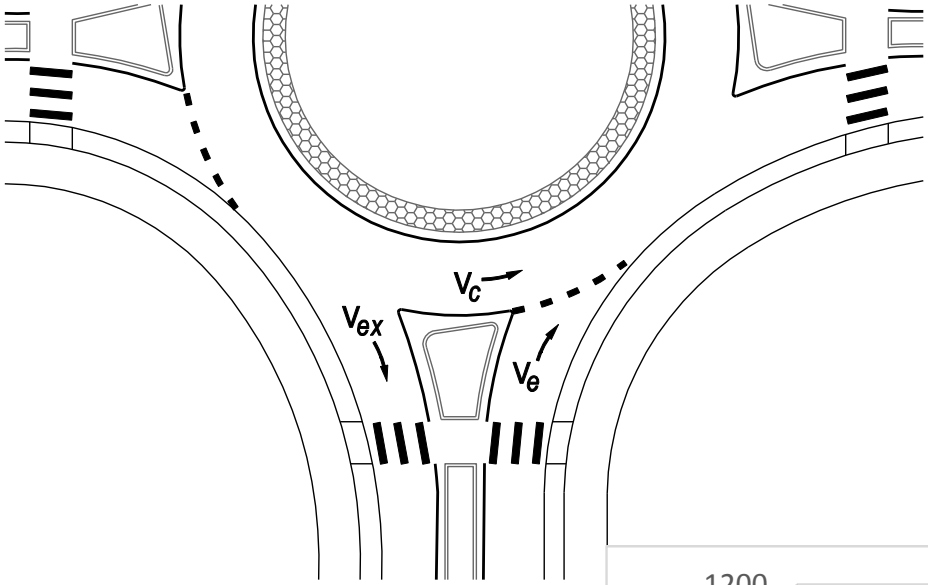
All vehicles circulate counter-clockwise and pass to the right of the central island. *Naples, FL*

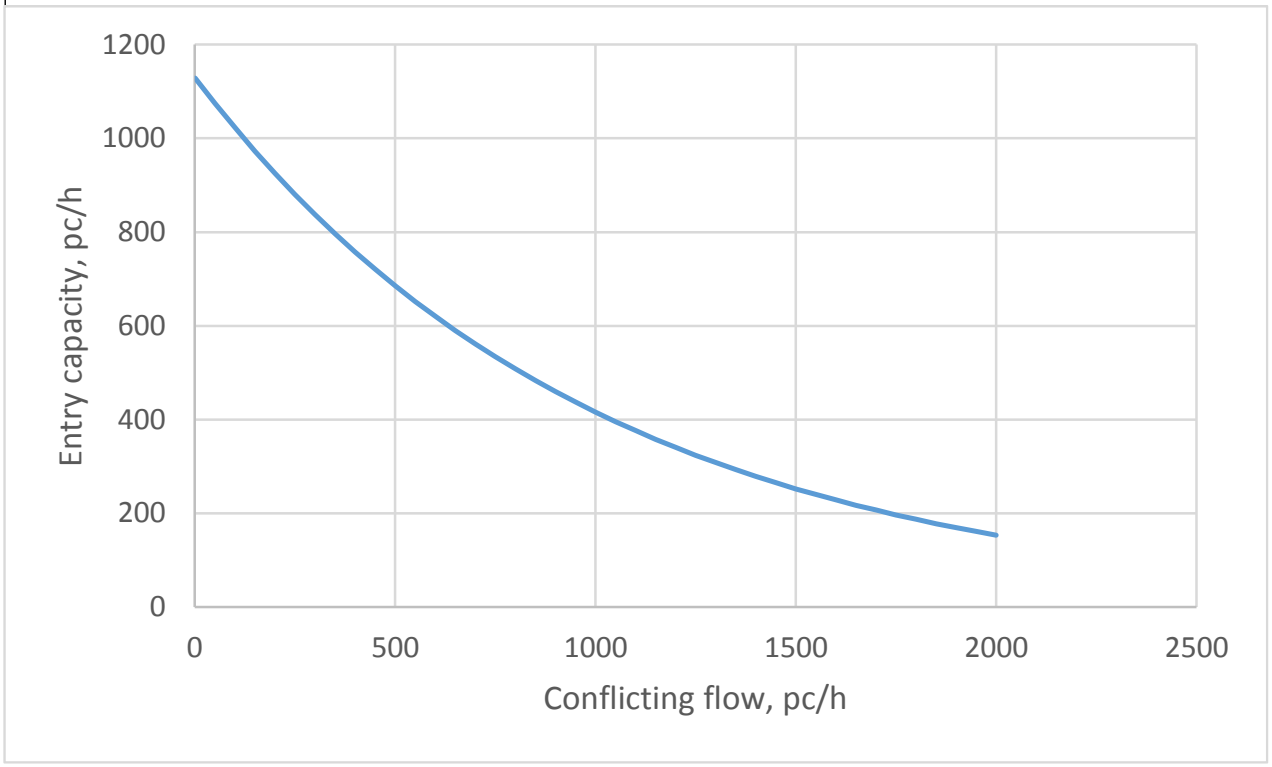
Traffic Circles

Some neighborhood traffic circles allow left-turning vehicles to pass to the left of the central island. *Portland, OR*



How does a roundabout operate?


V_c
V_{ex}
V_e


1200
1000
800
600
400
200
0
Entry capacity, pc/h
0
500
1000
1500
2000
2500
Conflicting flow, pc/h

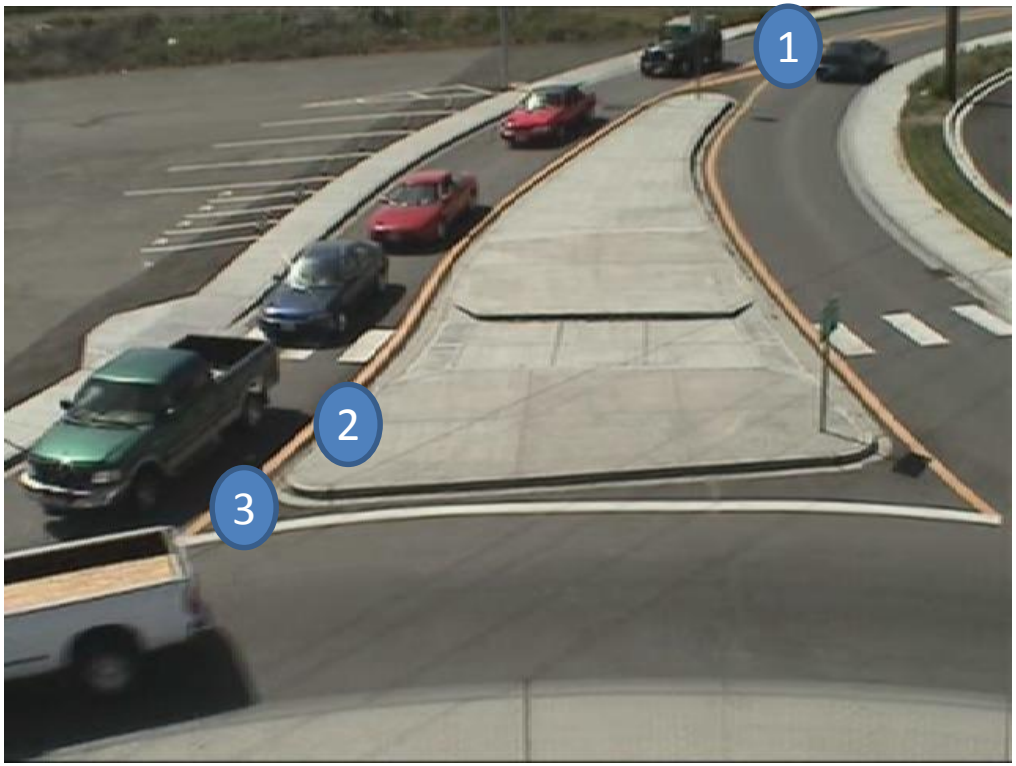

roundabout queuing concepts video 2014.02.2
from Michael Kyte PLUS
Queue
00:43


roundabout gap acceptance video 2014.02.24
from Michael Kyte PLUS
Gap #7
Interval = 18.3 sec
Number of vehicles using gap = 5
01:13

Events of interest

Delay data

1. Time vehicle arrives at back of queue
2. Time vehicle arrives at yield line
3. Time vehicle enters roundabout



Events of interest

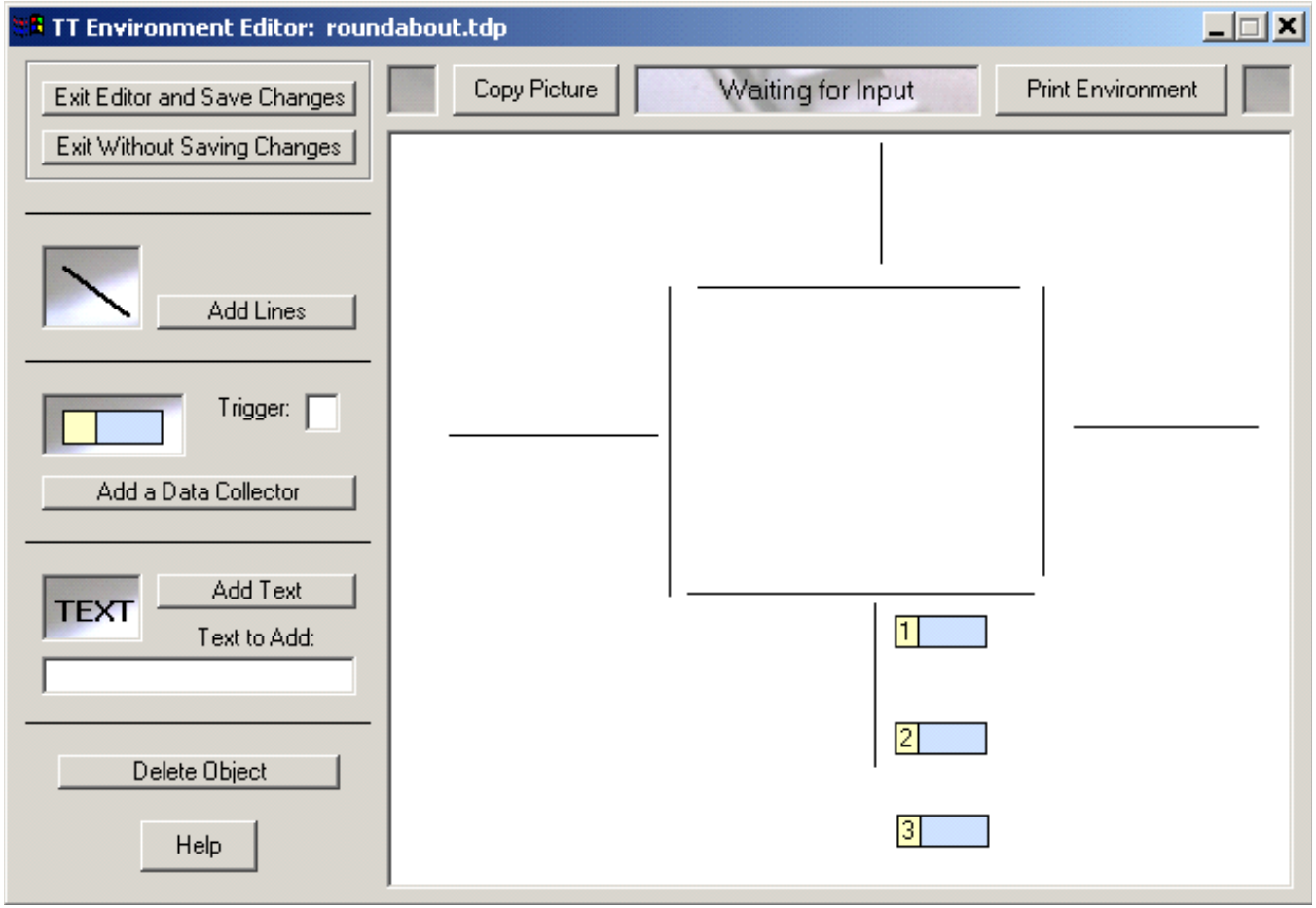
Gaps accepted and rejected

- Begin and end gap events for circulatory vehicles (4)
- Time minor stream vehicle enters roundabout (3)

Using Traffic Tracker

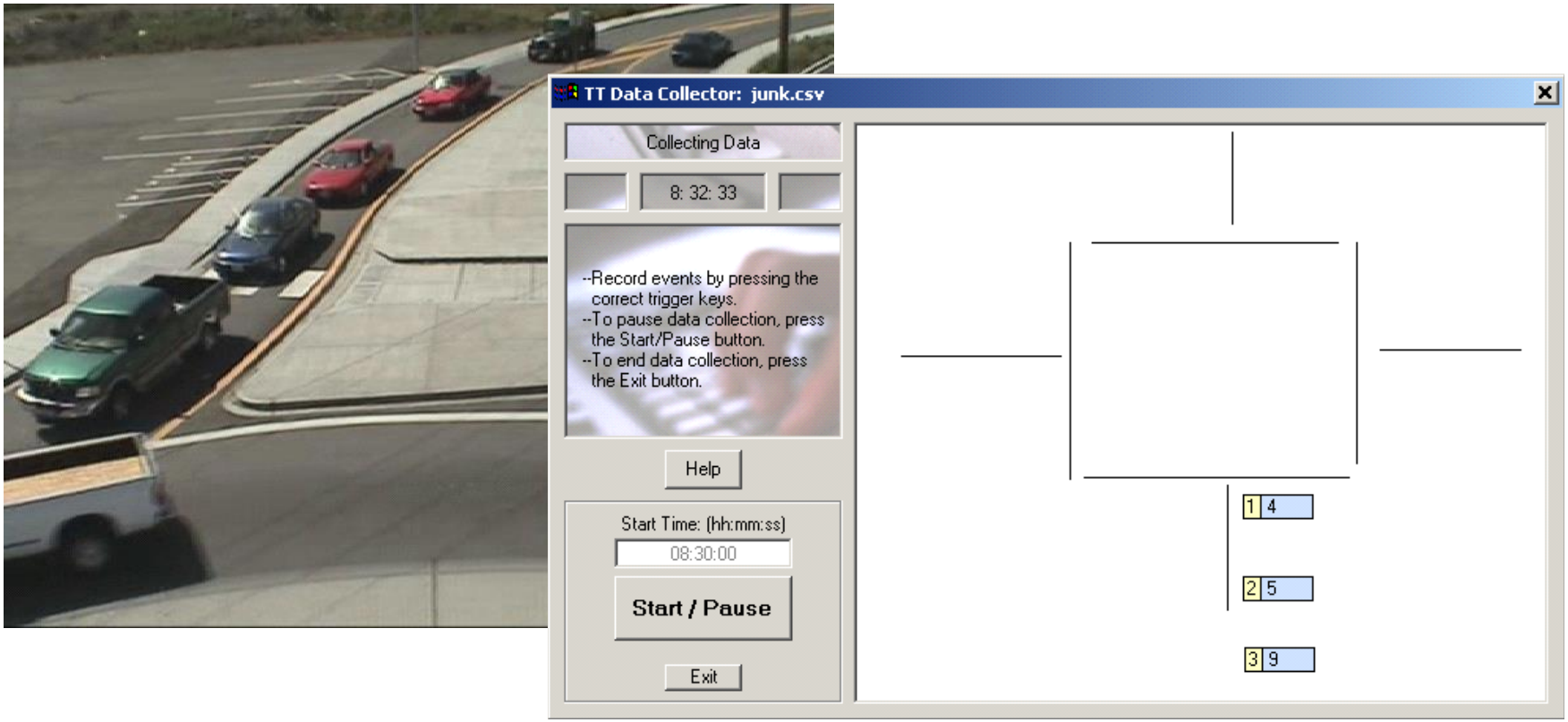
Using Traffic Tracker

- Setting up a data collection environment



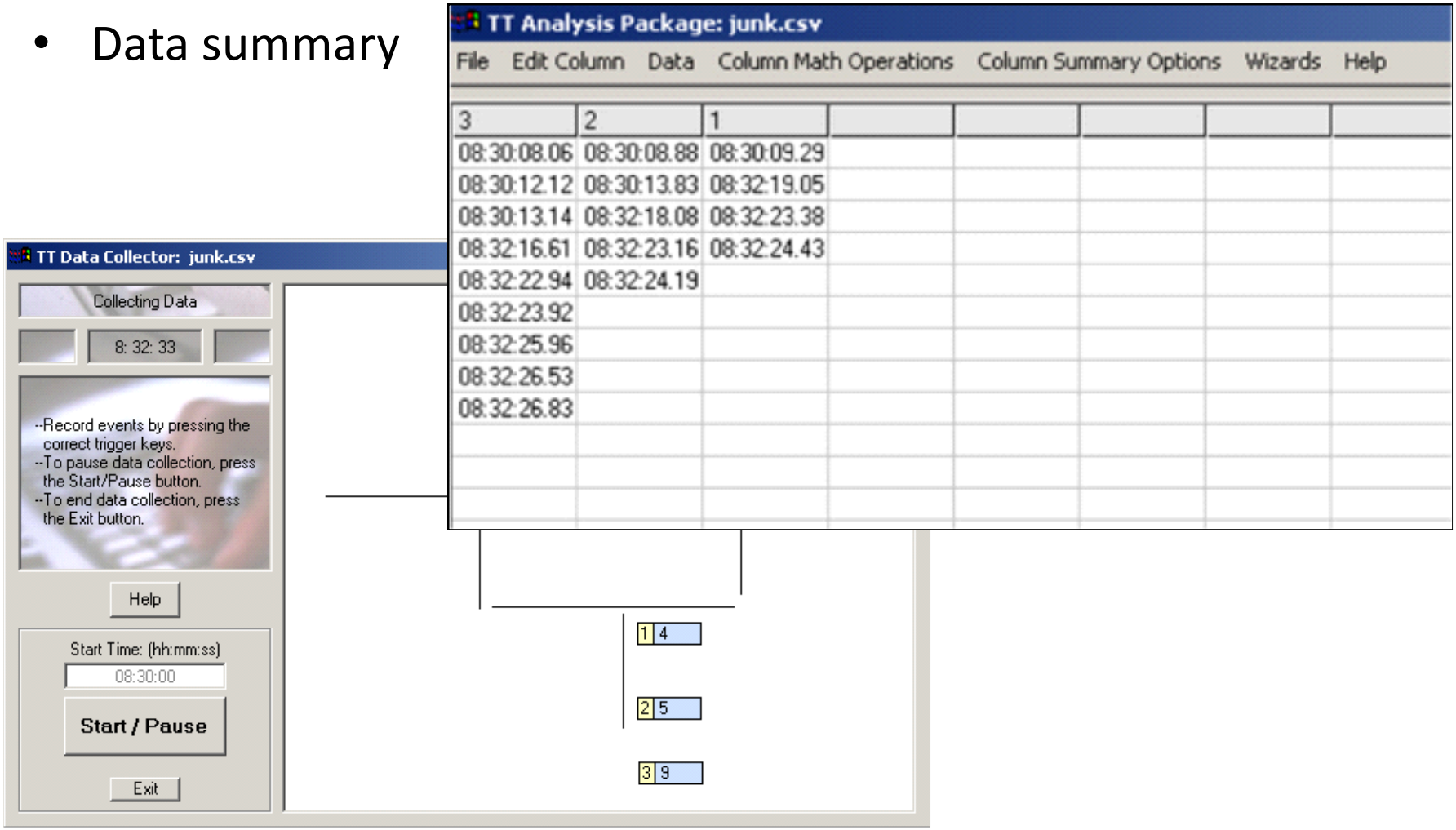
Using Traffic Tracker

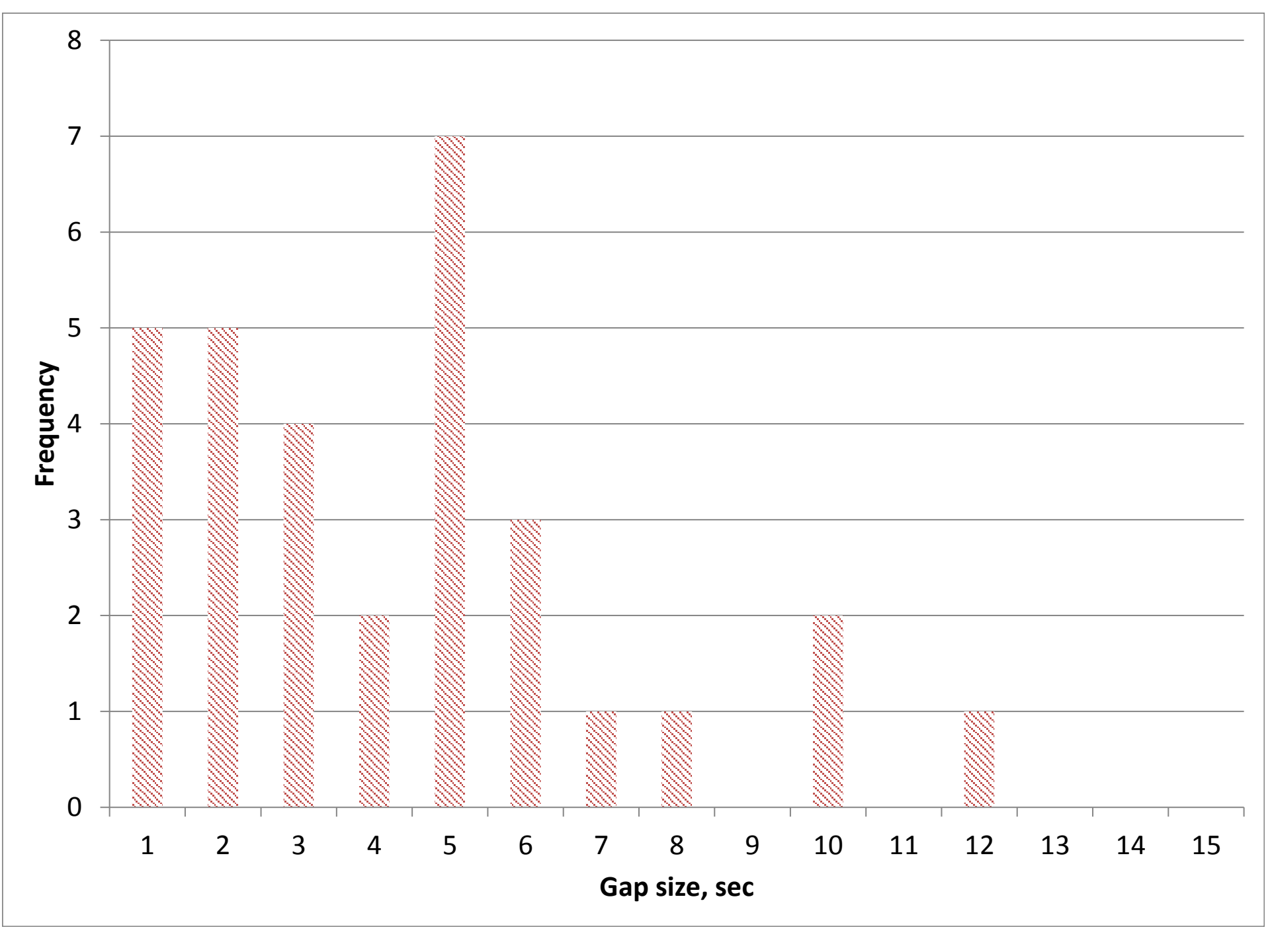
- Data collection

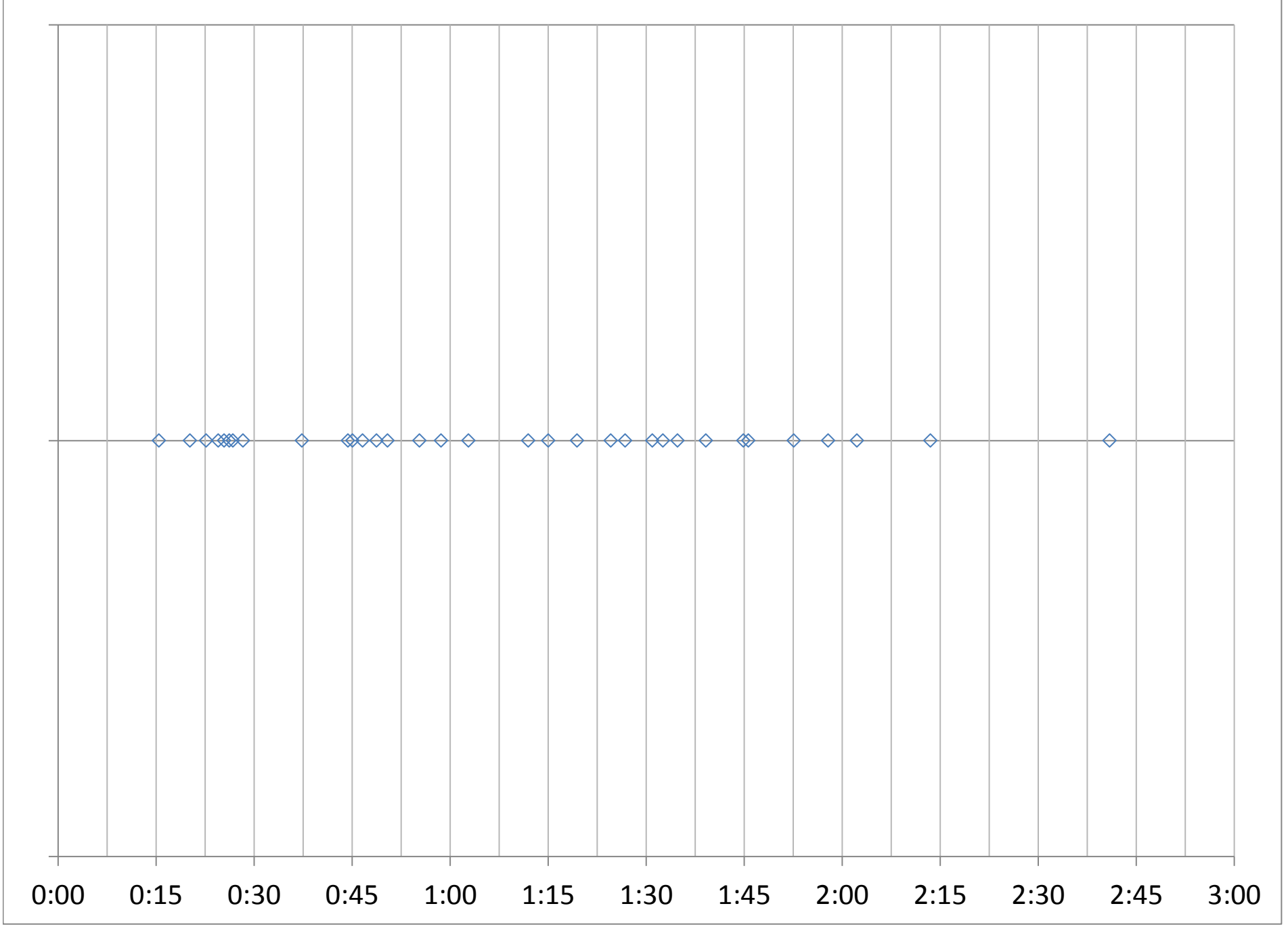


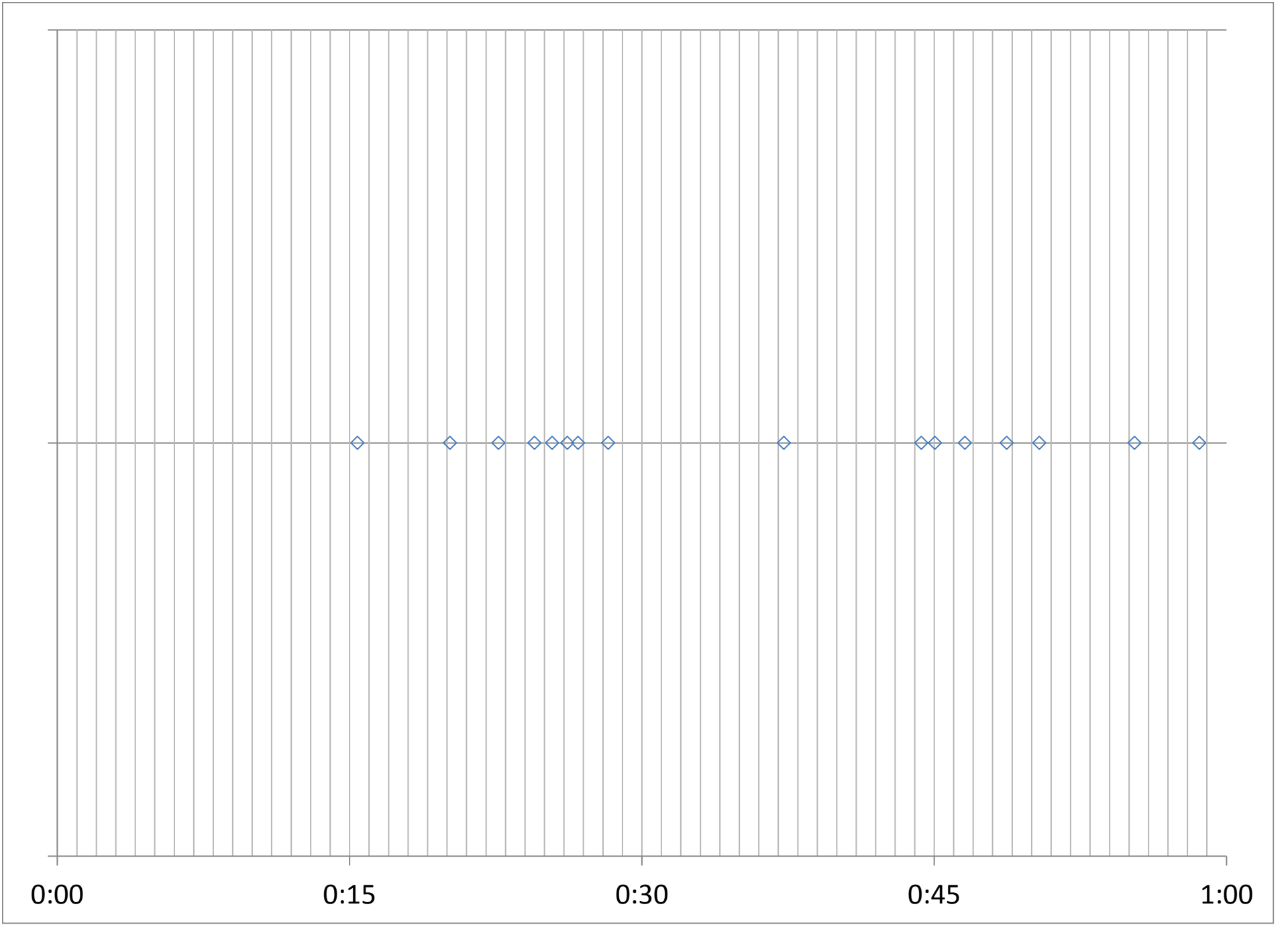
Using Traffic Tracker

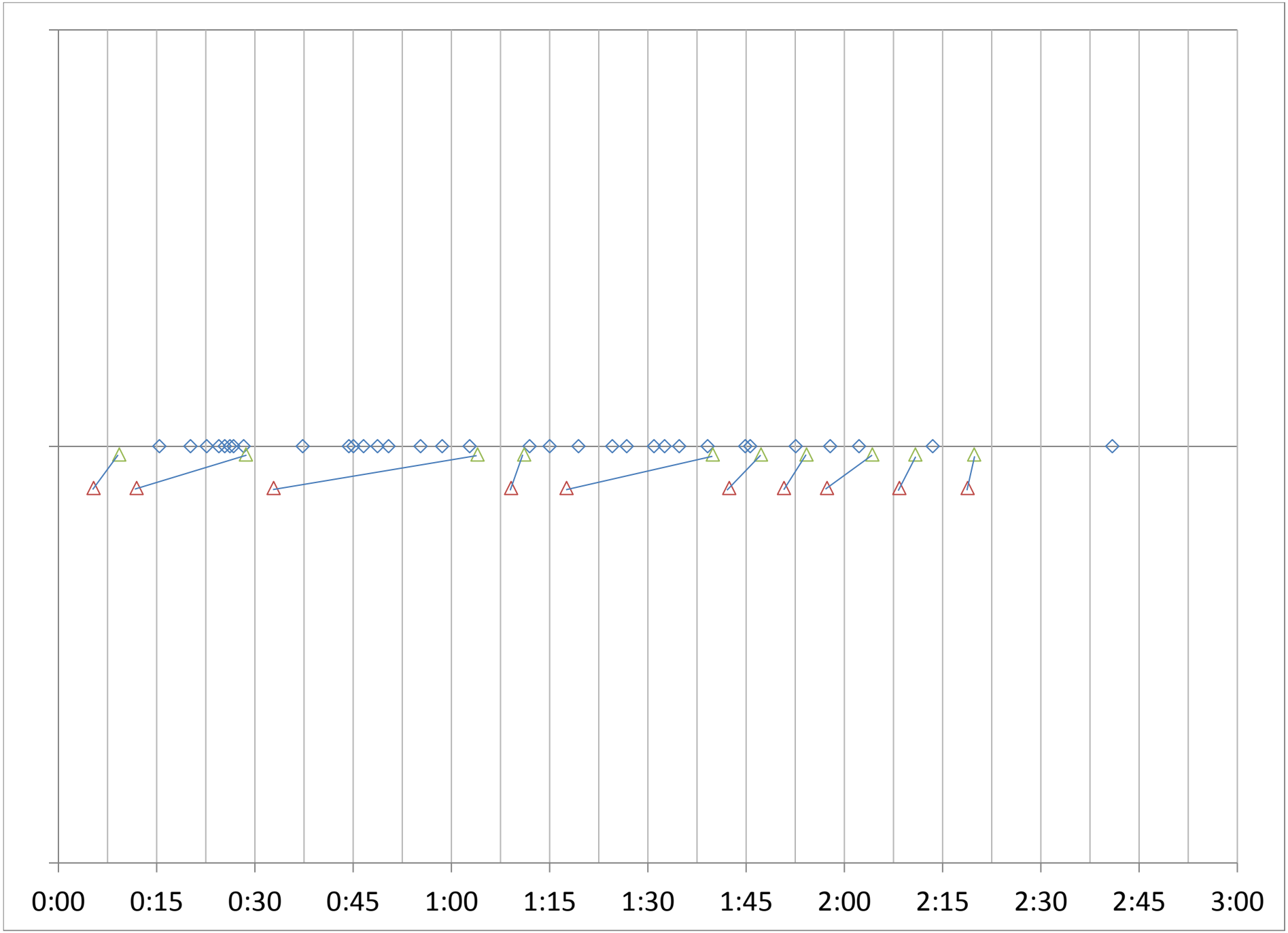
- Data summary




8
7
6
5
4
3
2
1
0
Frequency
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Gap size, sec


0:00
0:15
0:30
0:45
1:00
1:15
1:30
1:45
2:00
2:15
2:30
2:45
3:00


0:00
0:15
0:30
0:45
1:00


0:00
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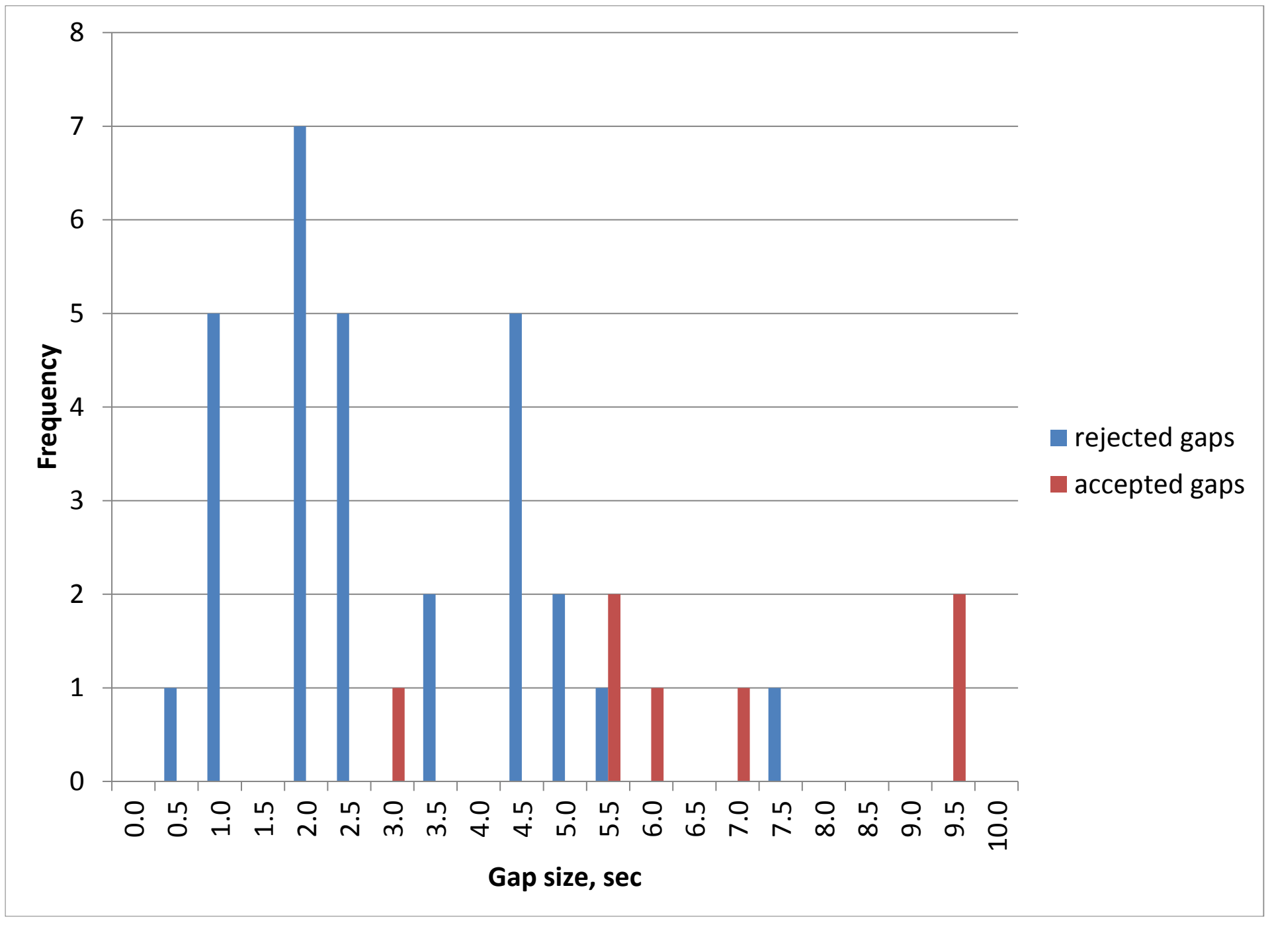
2:45
3:00


8
7
6
5
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3
2
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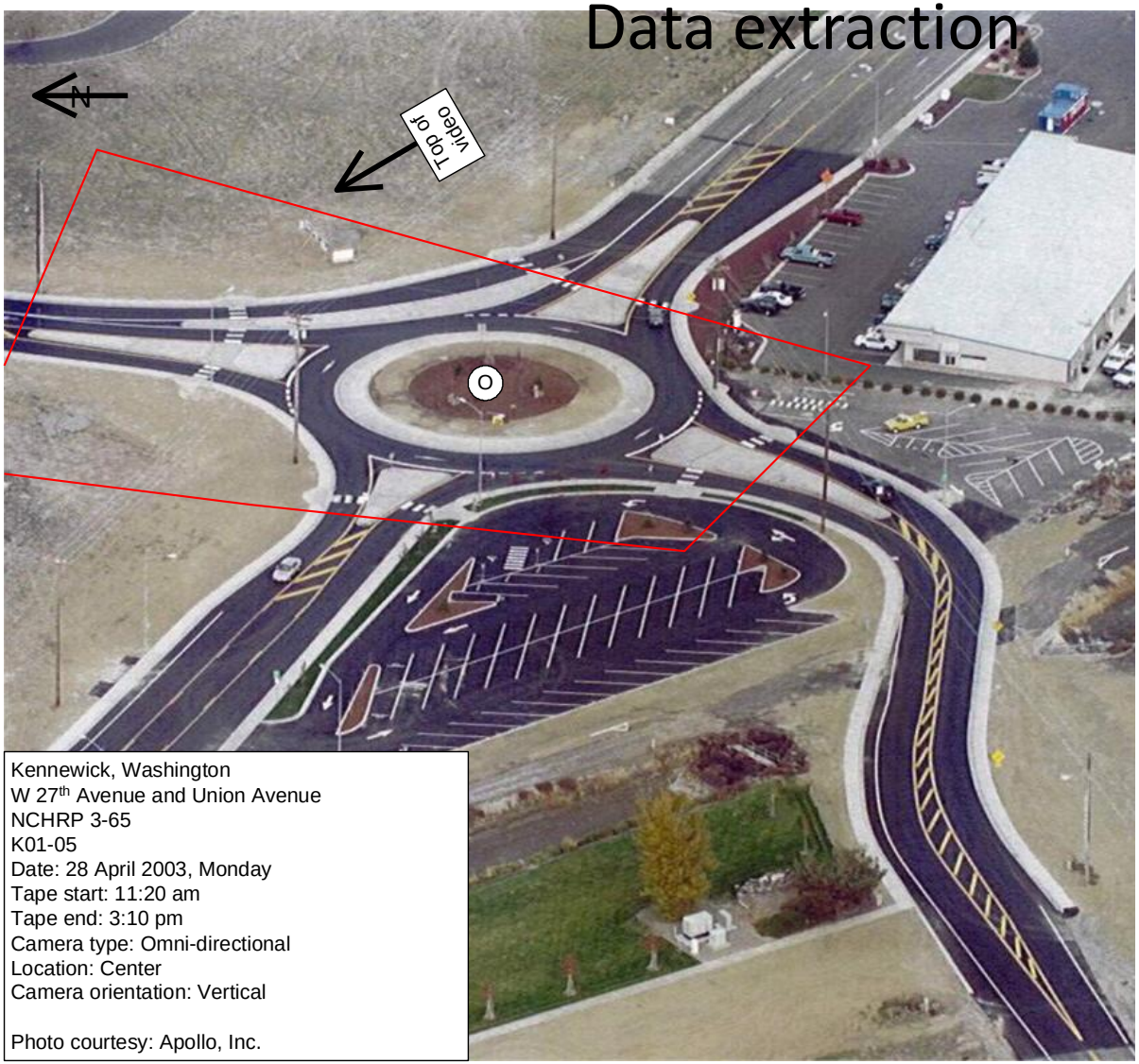
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
8.5
9.0
9.5
10.0
Gap size, sec
rejected gaps
accepted gaps

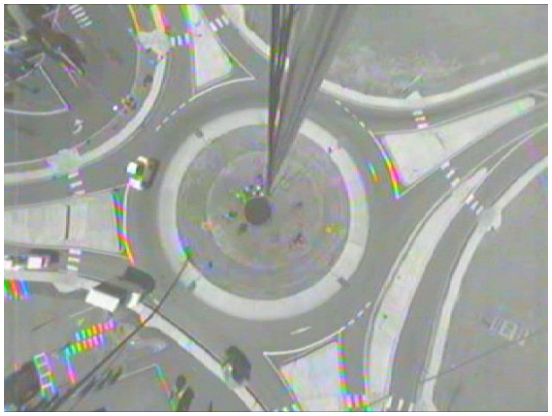
Data extraction

Data extraction



Kennewick, Washington
W 27th Avenue and Union Avenue
NCHRP 3-65
K01-05
Date: 28 April 2003, Monday
Tape start: 11:20 am
Tape end: 3:10 pm
Camera type: Omni-directional
Location: Center
Camera orientation: Vertical

Photo courtesy: Apollo, Inc.



Data extraction

Kennewick, Washington
W 27th Avenue and Union Avenue
NCHRP 3-65
K01-06
Date: 28 April 2003, Monday
Tape start: 11:20 am
Tape end: 3:10 pm
Camera type: Sony
Location: Center
Camera orientation: South approach

Photo courtesy: Apollo, Inc.

Project overview

- Data collection