

## Vehicle Detector Placement Policy

Vehicle Detector Placement Policy as of 4-1-09 is:

- New Pavement; All Vehicle Detector Loops shall be placed Under
- Existing Pavement with Vehicular Speed of 35 mph or less; Vehicle Detector Camera shall be placed on Mast Arm and Approach Vehicle Detectors shall be Saw in Loops
- Existing Pavement with a speed of 40 mph or more; All Vehicle Detectors shall be Saw in Loops
- Mill and Overlay; Vehicle Detectors will be sawed 2" into base
- All sawed in Vehicle Detectors shall be at least 1' from any joint

Costs for Detection at a Moderate Intersection is:

- Loops Under Surface (detectors  $\$140 \times 36$ ) + (cable  $\$1.30 \times 270 \times 10$ ) =  $\$8,550$
- Loops Sawed in Surface (detectors  $\$655 \times 36$ ) + (cable  $\$1.30 \times 270 \times 10$ ) =  $\$27,090$
- Camera (cameras  $\$2000 \times 4$ ) + (camera equipment  $\$567$ ) + (cable  $\$2.60 \times 200$ ) =  $\$9,087$
- Loops under Replaced Surface (surface  $\$36,000$ ) + (detectors  $\$140 \times 36$ ) + (cable  $\$1.30 \times 270 \times 10$ ) =  $\$44,550$

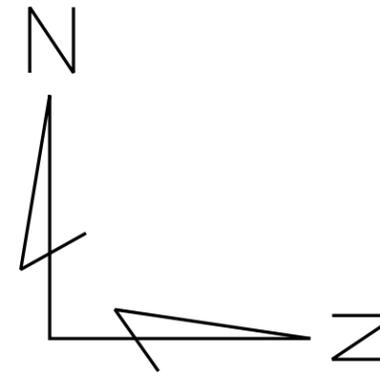
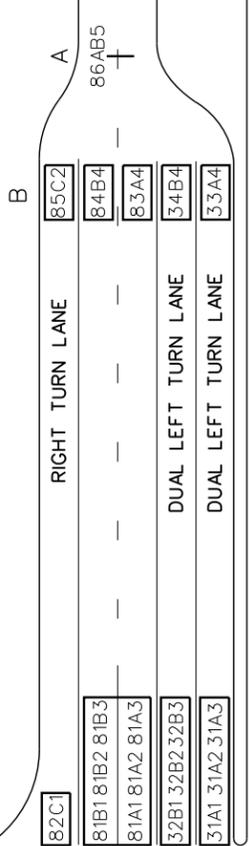
Reasons for less Vehicle Detector Cameras:

- Although cameras are a cost benefit, certain conditions make them less attractive to use.
  - A loss of detection deemed acceptable because of relative infrequency would be sun, fog, snow and darkness. After these conditions pass the Controller will realize and function efficiently again.
  - A loss of detection deemed unacceptable is the dirty snow melt spray from higher speeds and trucks. The only way to fix this is with a worker, a bucket truck, window cleaner and a rag. The above mentioned worker and bucket truck are in short supply.
  - During the above mentioned detection outages, the Signal Controller at the intersection will default to like a pre-timed intersection. A maximum amount of time would be given to each phase. This would mean a vehicle could be waiting all alone, while the Controller is servicing other phases that have no vehicle.

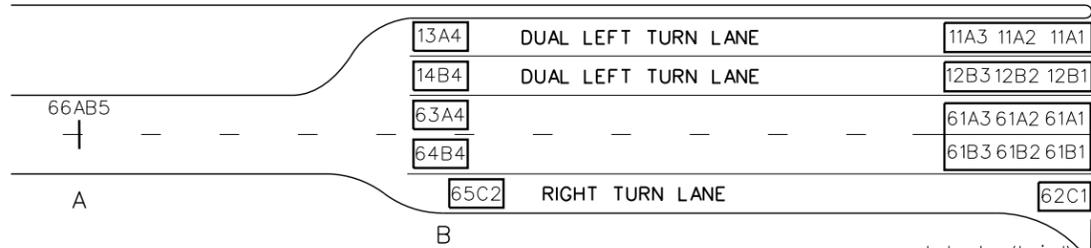
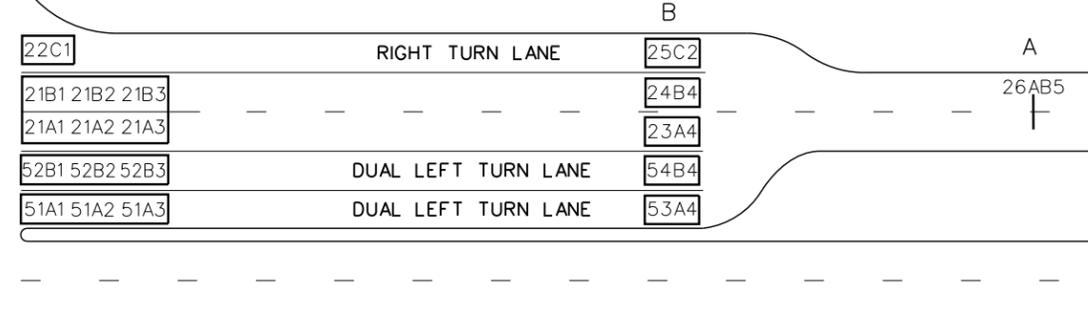
**ADVANCED DETECTOR LOCATION**

Speed Limit	Detector A	Detector B
< 40	NA	200'
40	310'	220'
45	340'	240'
50	375'	270'
55	410'	300'

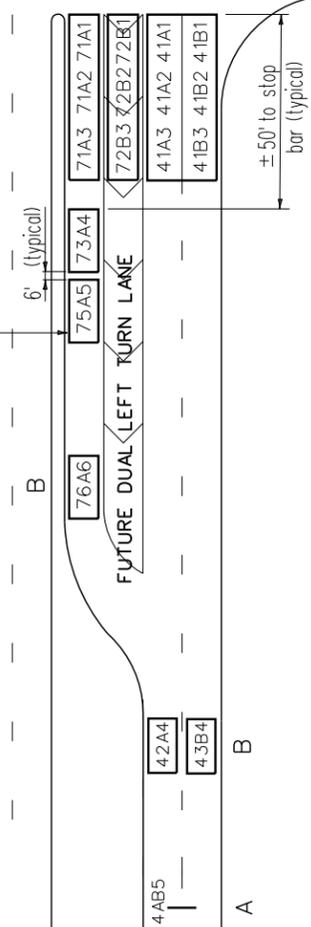
The Advanced Detector Locations are measured from stop bar or crosswalk. Detector A is a Magnetic Detector centered below approaching traffic. Detector B is a Loop Detector. When in a Turn Lane it shall be placed as listed above or at the beginning of the full lane, whichever is less. The Stop Bar Detectors are a cluster of Loop Detectors within the same amplifier spaced 9' apart longitudinally at the stop bar. Detectors are centered in the lane, arranged 1' from a joint or manhole. The Right Turn Lane Stop Bar Detector is single. Loop Detectors are only placed under new paving or sawed into the surface when the speed limit is 40 mph or more. If 35 mph or less with an existing surface, then no Loop Detectors are to be placed at the Stop Bar locations. Detector numbering starts at the actual detector placed closest to the intersection.



**MAIN STREET**



at stop bar (typical)



**VEHICLE DETECTOR NUMBERING AT A MAJOR INTERSECTION USING ONLY VEHICLE DETECTORS**

- = Detector Amplifier Zone or Cluster
  - = Magnetic Detector
- Phase
- Amplifier (maximum 6, 6' x 6' Loops)
  - Lane (left to right per phase)
  - Detector from stop bar

**DETECTOR NUMBERING**

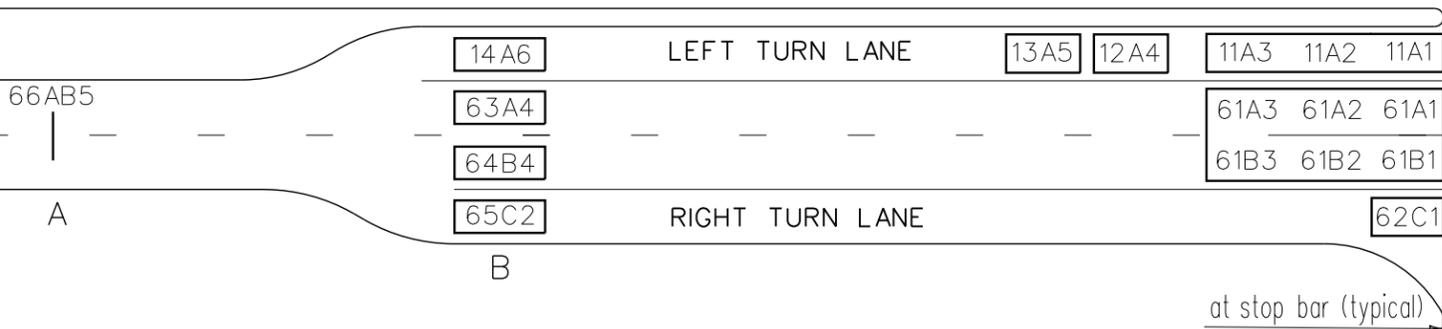
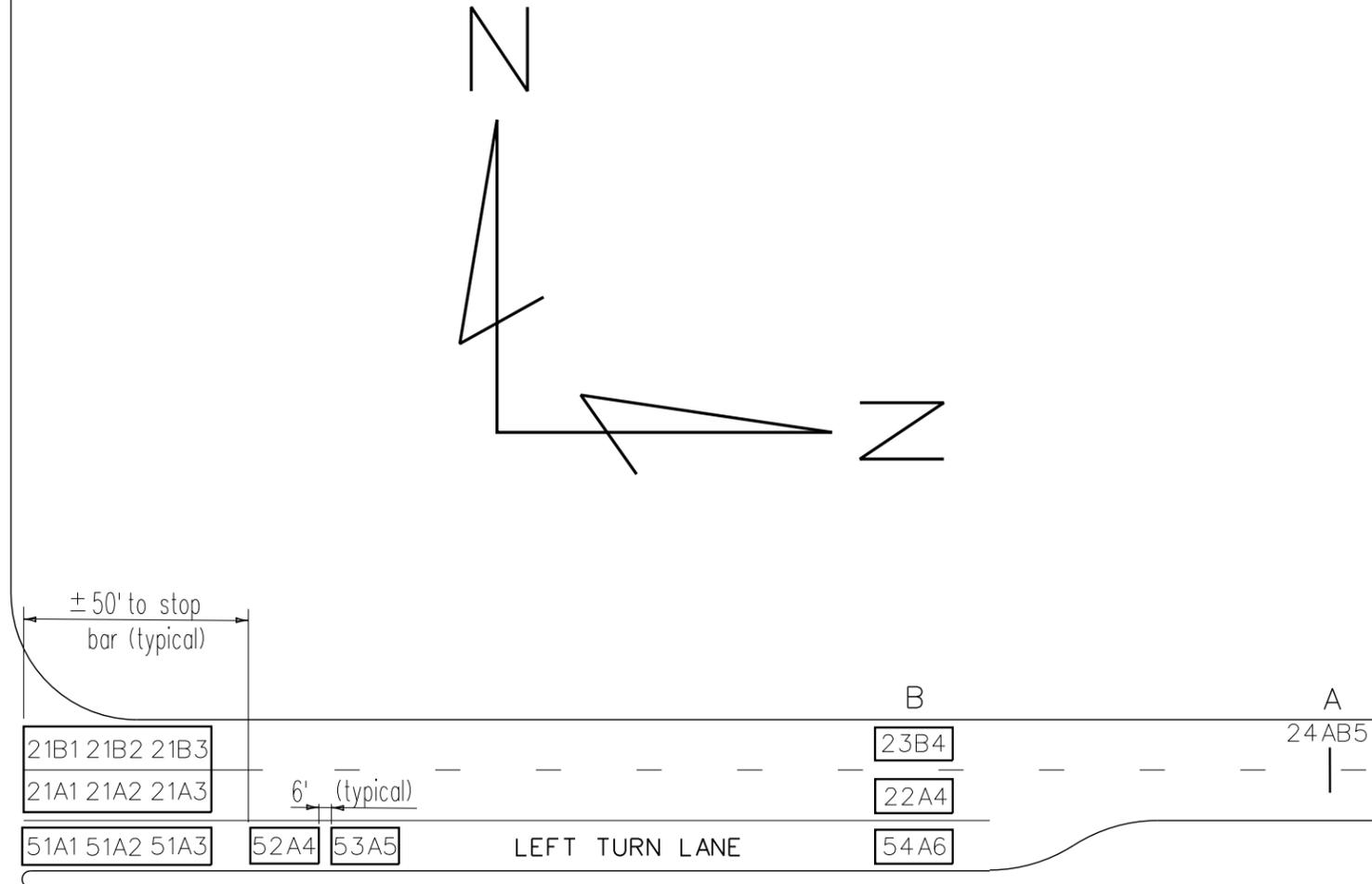
place only if servicing a protected/permissive and outside dual is painted out

**ADVANCED DETECTOR LOCATION**

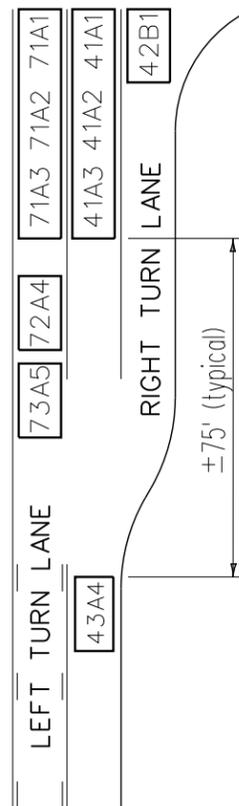
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LOW VOLUME LEG

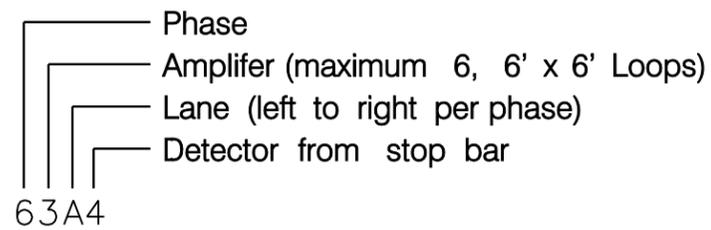


MODERATE VOLUME LEG



**VEHICLE DETECTOR NUMBERING AT A MAJOR/MINOR OR COLECTOR INTERSECTION USING ONLY VEHICLE DETECTORS**

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- = Magnetic Detector

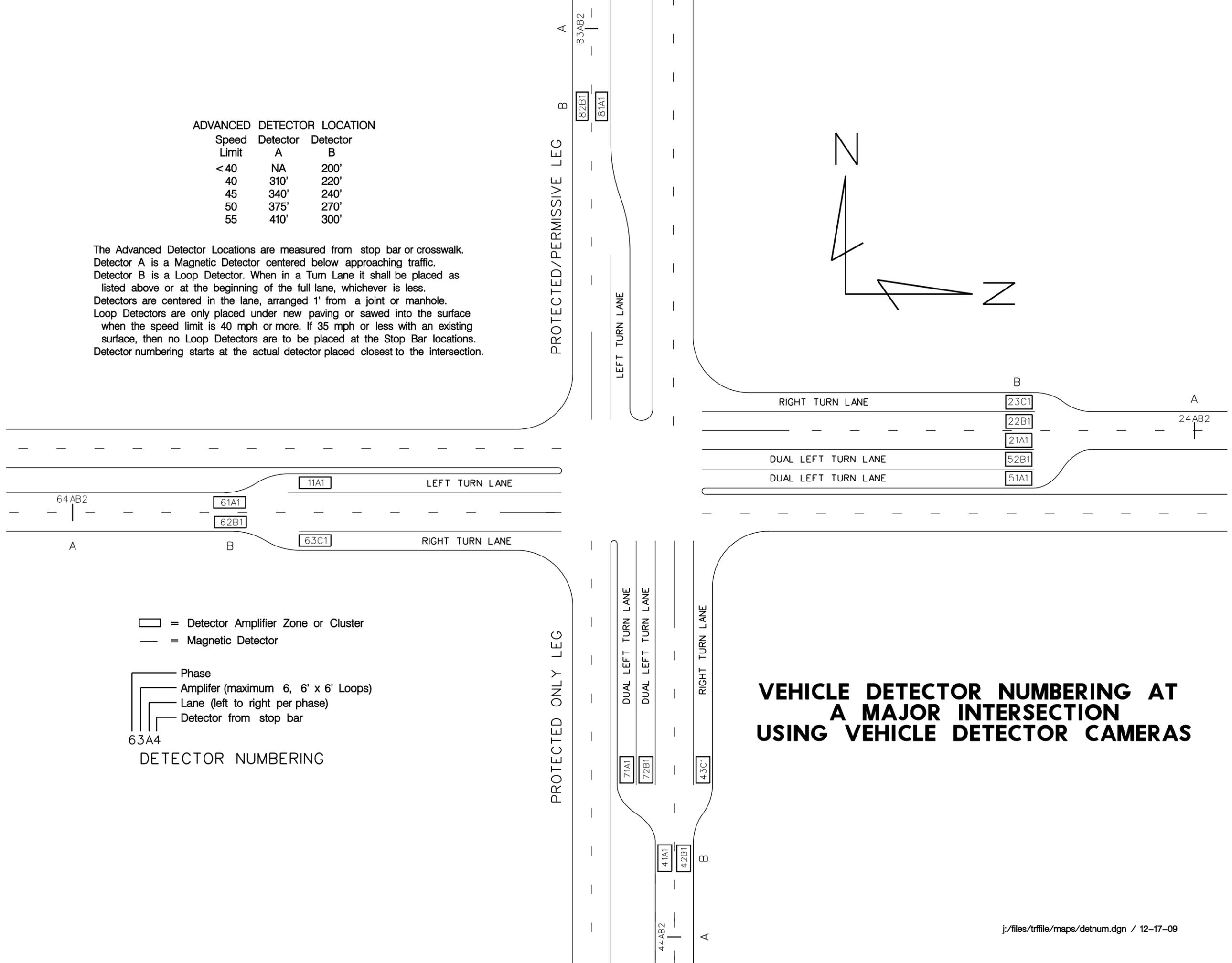


**DETECTOR NUMBERING**

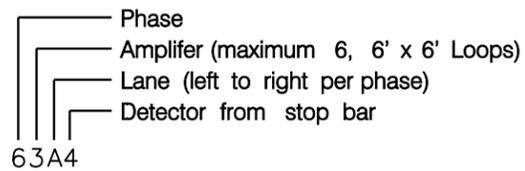
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- = Detector Amplifier Zone or Cluster
- = Magnetic Detector



DETECTOR NUMBERING

**VEHICLE DETECTOR NUMBERING AT A MAJOR INTERSECTION USING VEHICLE DETECTOR CAMERAS**

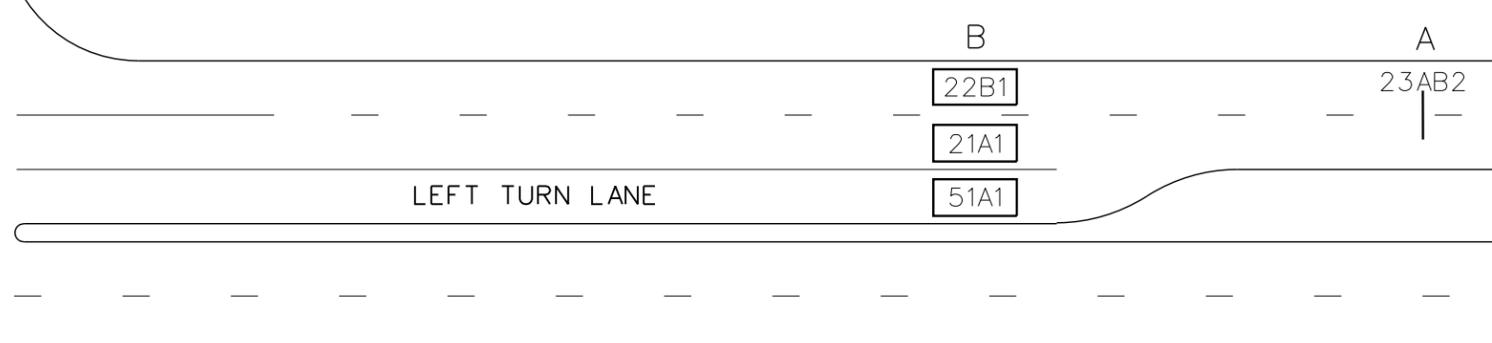
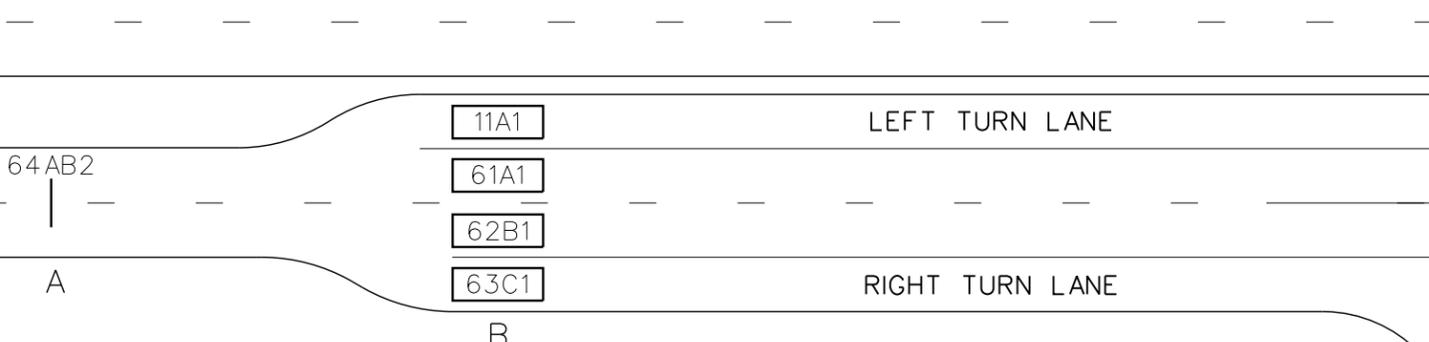
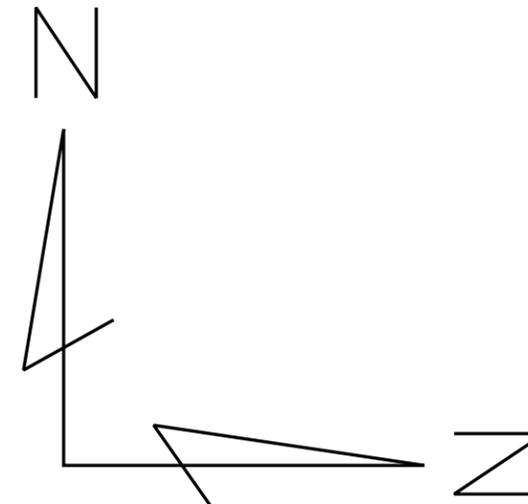
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LOW VOLUME LEG

LEFT TURN LANE



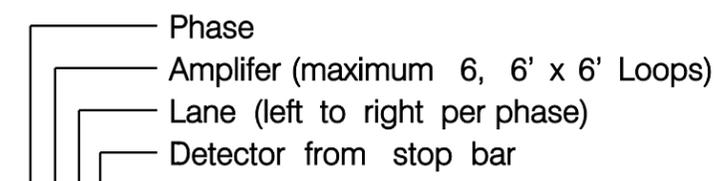
LEFT TURN LANE

RIGHT TURN LANE

MODERATE VOLUME LEG

41A1

- = Detector Amplifier Zone or Cluster
- = Magnetic Detector



63A4

DETECTOR NUMBERING

**VEHICLE DETECTOR NUMBERING AT A MAJOR/MINOR INTERSECTION USING VEHICLE DETECTOR CAMERAS**