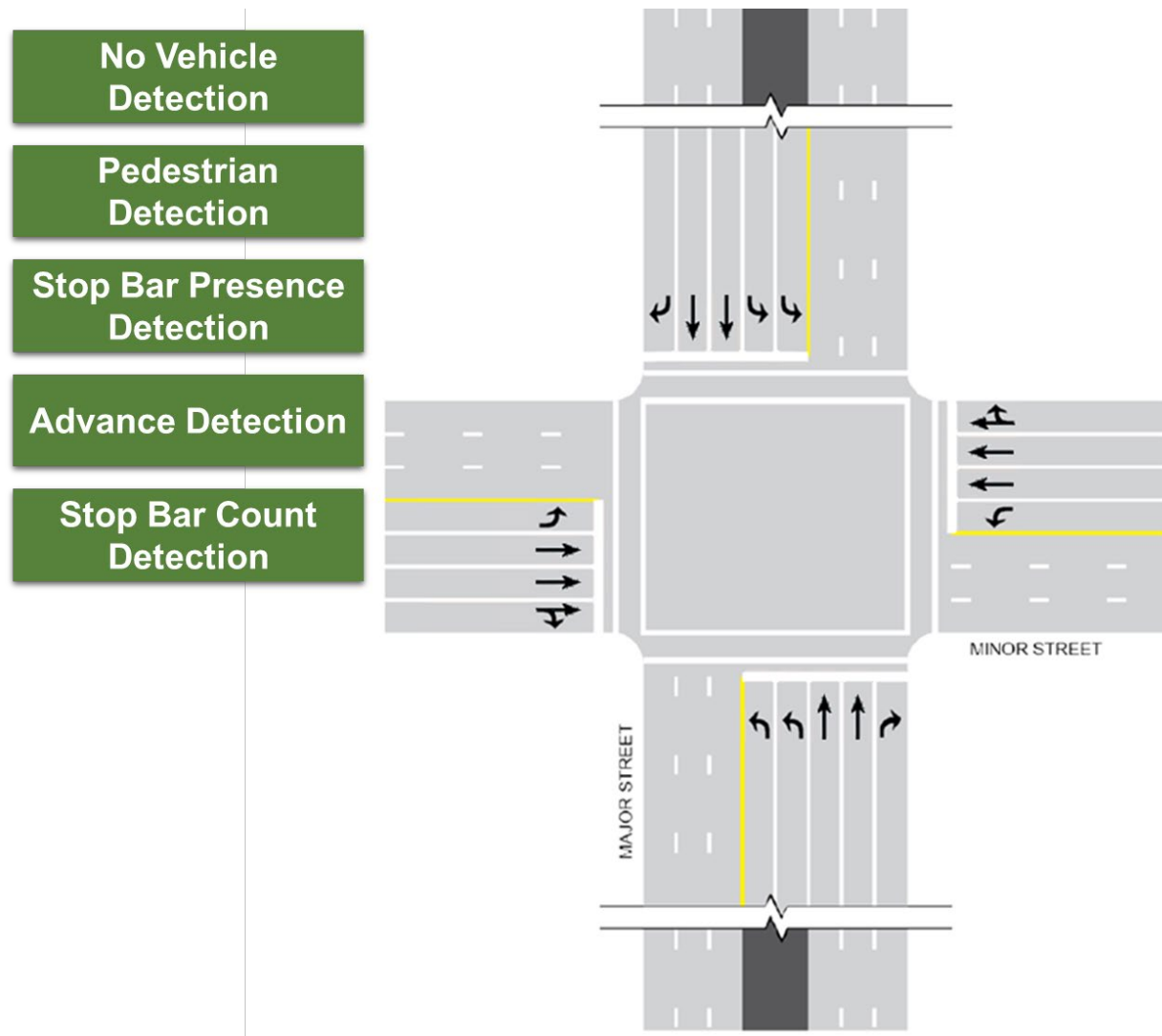


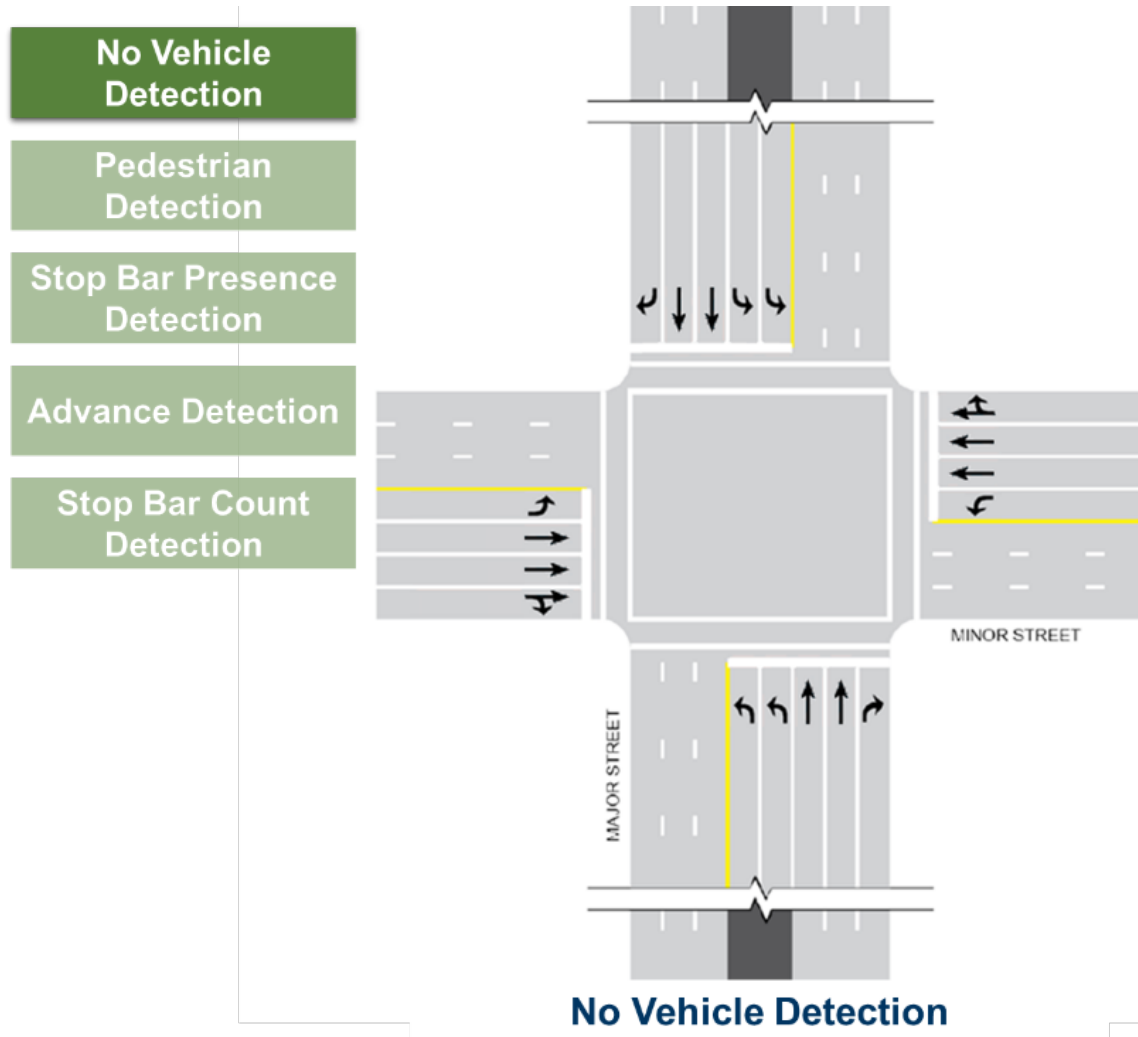
Detector Layout Levels

The types of detection that can typically be found at an intersection are Stop Bar Presence Detection, Advance Detection, and Stop Bar Count Detection. Some intersections can also be pre-timed and do not rely on any vehicle detection.



No Vehicle Detection

Vehicle detection systems are not strictly required for ATSPMs. Several reports are able to be generated without vehicle detection. These include Phase Termination, Split Monitor, Pedestrian Delay, and Preemption Details. These reports are controller-based and able to be produced with any vehicle detector layout.

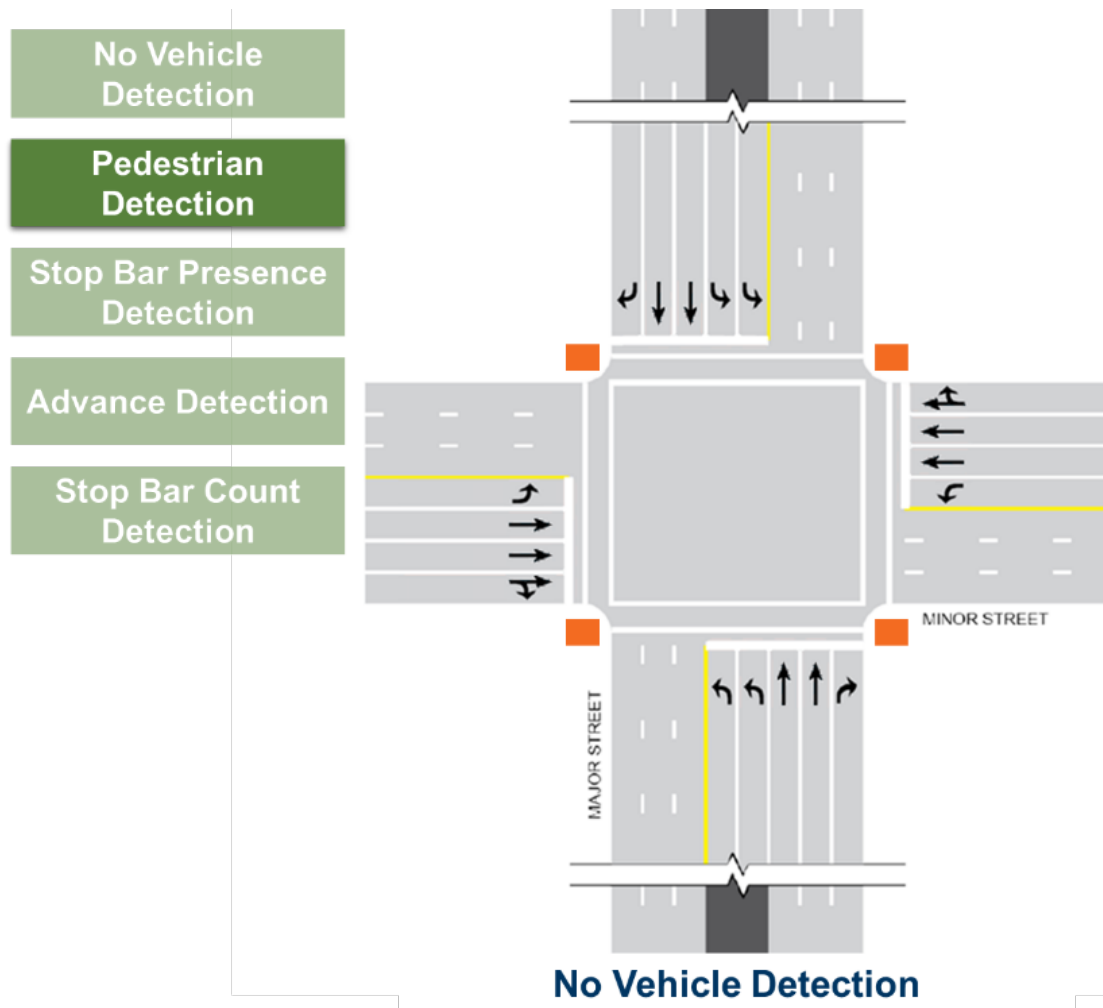


Available ATSPM Reports

- Phase Termination
- Split Monitor
- Estimated Pedestrian Delay
- Vehicle Volumes
- Split Failure
- Purdue Coordination Diagram
- Offset Adjustment Diagram
- Preemption Details
- Left Turn Gap Analysis
- Actuations on Yellow and Red

Pedestrian Detection

With pedestrian detection, the estimated pedestrian delay chart can be generated. Pedestrian detection is most often implemented through push buttons, but passive detection using video or infrared is also possible.

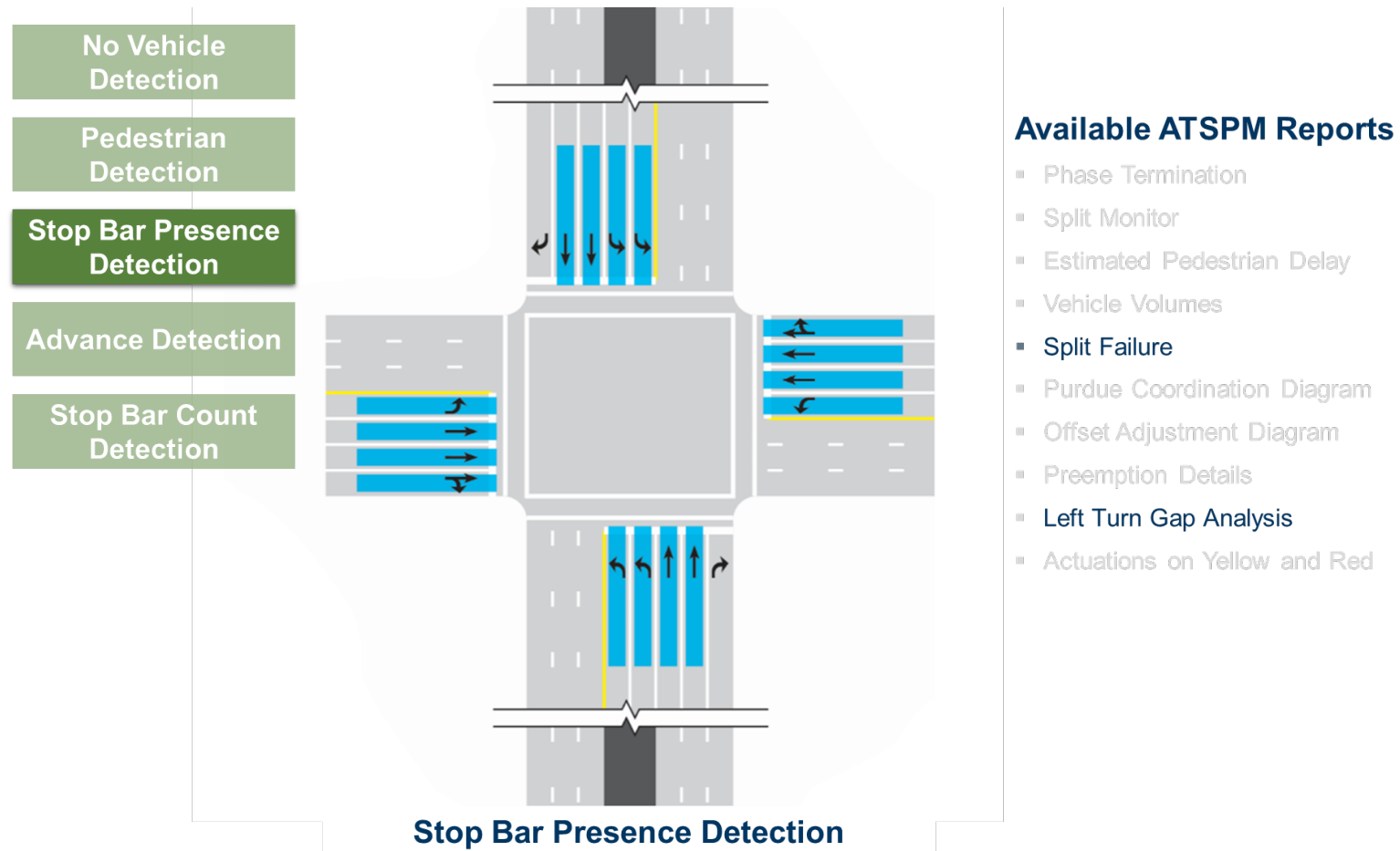


Available ATSPM Reports

- Phase Termination
- Split Monitor
- **Estimated Pedestrian Delay**
- Vehicle Volumes
- Split Failure
- Purdue Coordination Diagram
- Offset Adjustment Diagram
- Preemption Details
- Left Turn Gap Analysis
- Actuations on Yellow and Red

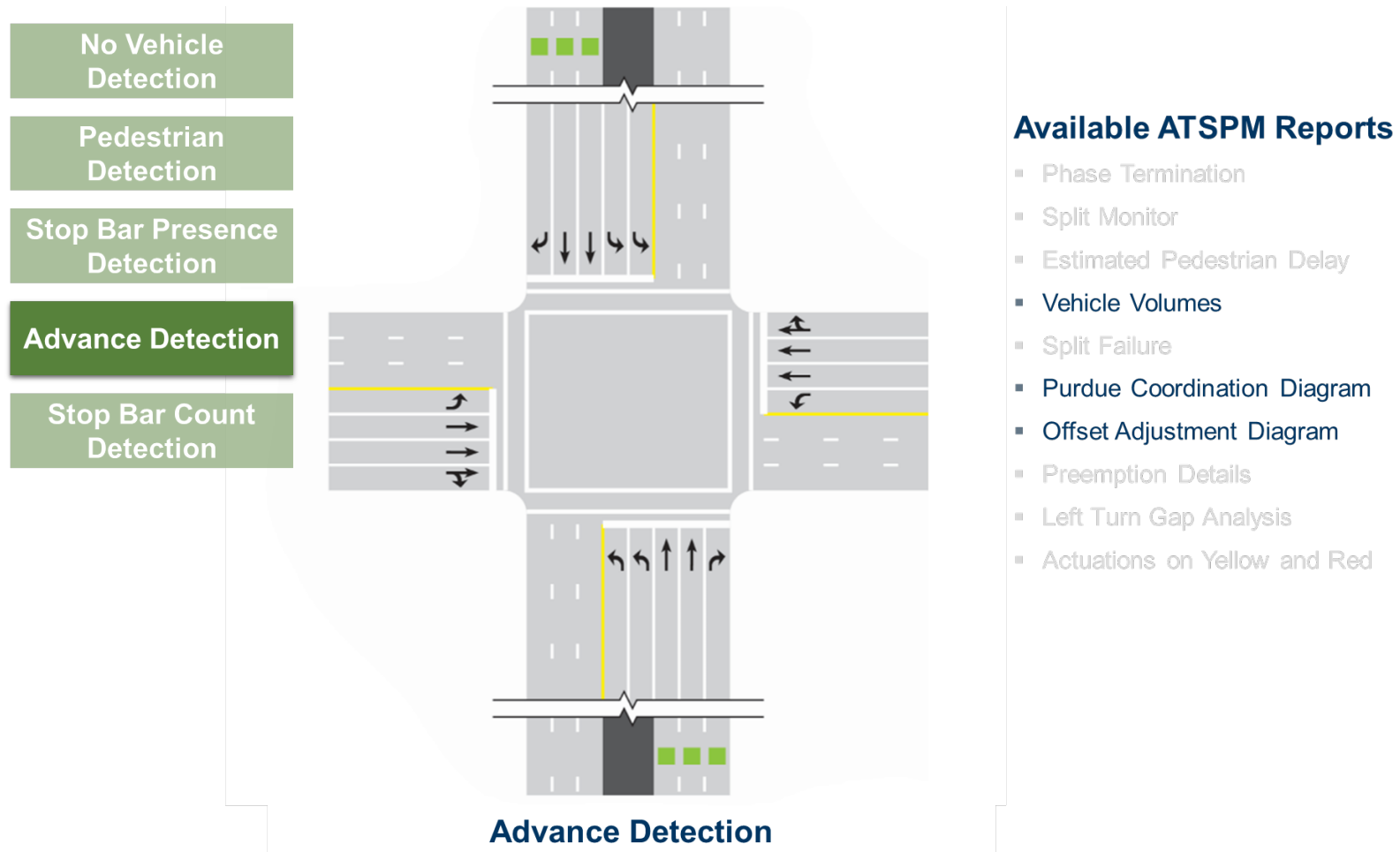
Stop Bar Presence Detection

With this detection configuration, presence detection is placed at the stop bar. Although a lane-by-lane configuration provides more accurate occupancy data, which is used for the Split Failure report, presence detection may be configured lane-by-lane or as a lane group. Logging the presence or absence of vehicles at the stop bar provides agencies with additional reporting capability with the Purdue Split Failure report. The Purdue Split Failure performance measure indicates how often vehicles are left unserved at the end of a phase, which can be correlated to delay experienced by drivers. Because stop bar detection on major street through lanes is less common in standard detection layouts, installation of stop bar presence detection on the major street may be required for full split failure information.



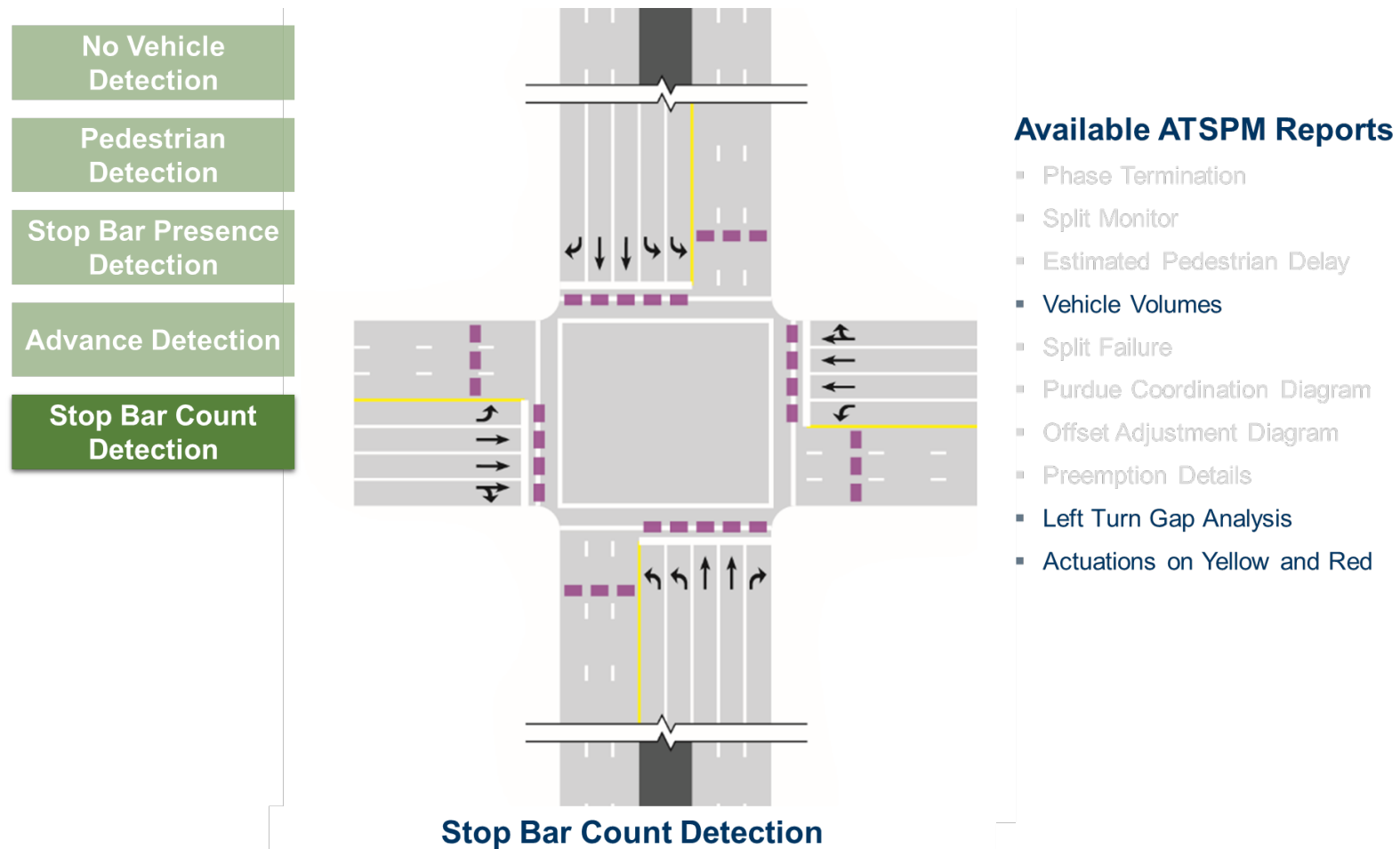
Advance Detection

Advance detection configuration includes advance count detectors, placed upstream of the stop bar, typically on the major street approach. The setback distance for these detectors will depend both on corridor context and on agency detection design guidance with typical setback values ranging from 300 feet to 450 feet. Advance count detectors may be configured lane-by-lane or as a lane group, with lane-by-lane configuration providing access to more accurate and insightful reporting. Advance detectors, sometimes referred to as setback detectors, are essential for evaluating coordination, by making it possible to relate vehicle arrival times to the local signal state.



Stop Bar Count Detection

Stop bar count detectors are located in front of the stop bar and may be placed either directly in front of the stop bar or in the receiving lanes, where they may be referred to as exit lane detectors. Stop bar count detection should be configured lane-by-lane to obtain more accurate estimation of turning movement counts and better ATSPM reporting. Common ATSPMs available with the inclusion of stop bar count detectors include left turn gap analysis, yellow and red actuation reporting, and the availability of turning movement counts. Bicycle detection can also be configured to report turning movement counts.



Summary of Performance Measures Available with Various Detection Types

ATSPM	No Additional Detection	Stop Bar Presence	Advanced Count	Stop Bar Count
Phase Termination	✓			
Split Monitor	✓			
Estimate Pedestrian Delay	✓			
Vehicle Volumes			✓	✓
Split Failure		✓		
Purdue Coordination Diagram			✓	
Offset Adjustment Diagram			✓	
Preemption Details	✓			
Left Turn Gap Analysis		✓		✓
Actuations on Yellow and Red				✓