RANKING OF FUNCTIONAL REQUIREMENTS/TOPIC AREAS FOR NEEDED RESEARCH BY THE TRB TRAFFIC SIGNAL SYSTEMS COMMITTEE JULY 21, 2002 MID-YEAR MEETING IN SALT LAKE

Note: These requirements were first defined by the committee in the early 90s; 9 were added at the 2000 Seattle meeting. By design, explanation/discussion of content & definition did NOT take place - the idea was to get a sense of the committee regarding research priorities. From this list, Research Problem Statements can be developed.

Following are in three priority groups (High, Medium, Low) per the voting; no specific order within a group.

- Jim Powell 7/23/02
High

1. Provide on-line (real-time) creation or modification of traffic plans. (B5)

2. Provide for integration of available data from multiple sources (B1) (e.g., travel time, queue lengths) into required traffic plans (phasing, timing, related functions); use expert systems?

6. Provide travel time estimation and verification. (A5) (i.e., for better timing plans and routing strategies; use probe vehicles?)

7. Provide plan selection by notification of congestion or near saturation conditions. (C5)
17. Provide processing of preempt/priority vehicle requests. (A3) (e.g., emergency vehicle, transit veh., other ITS subsystems)

28. Closely spaced intersections.

30. Traffic safety related to signal system operation.

31. Ramp metering interaction with traffic signals.
Medium

3. Provide processing of data from other data collection devices/techniques. (A2)
   (e.g., above ground detectors/video detectors, environ. detectors, “probe” vehicles)

4. Provide arterial incident detection. (A4)
   (i.e., additional detection hardware & software)

5. Provide techniques for short term traffic flow prediction. (B4)

9. Provide several control objectives. (C8)
   (e.g., min. delay, queue/congestion dissipation, demand “gating”, improved air quality)
Medium (cont.)

12. Provide an on-line presentation of traffic demand, short term estimates and available system responses. (F12) (i.e., so operators can make final decision on control changes).

20. Provide for implementation of adaptive control algorithms at the controller. (D7)

29. Traffic models/simulation.
11. Provide measures of long term traffic trends. (A6) 
(i.e., post processing and analysis capabilities for 
performance evaluation and system planning)

13. Provide on-line, expert system calculation of actual values 
for intersection/system measures of effectiveness specific to 
the various control objectives. (G2)


(e.g., special timing, relation to ITS systems/routing, etc.)

27. Driver expectations.
32. Driver expectancy at grade crossings.

33. Detection/classification of train movements (relative to grade crossings).