

RESEARCH QUESTION

This project involves using the TriMet Bus Dispatch System (BDS) data for Route 19 to evaluate schedule adherence and identify locations and times of day when schedule adherence problems arise and bus bunching is an issue. How do bus bunching problems increase as buses travel along the route?

BACKGROUND

Bus “bunching” occurs when buses on a route have problems maintaining the pre-determined headway and “bunch” together along the route. These schedule adherence problems can stem from a variety of operating conditions, but usually relate to traffic conditions or unexpected transit demands. When bus bunching occurs, inconsistent bus loading patterns can result—often the first bus will be more heavily loaded than normal and subsequent buses will have fewer passengers since insufficient time has elapsed for new passengers to gather at stops. The heavily-loaded lead bus will frequently bypass stops with waiting passengers to allow lightly-loaded following buses to serve the stop. This pattern can frustrate passengers—those on board the lead bus are uncomfortably crowded and those being bypassed at stops do not necessarily recognize that the next bus is moments away. Overall, bus bunching can lead to passenger dissatisfaction with the service, so it is to the transit operator’s advantage to maximize schedule adherence along a route.

Select one non-“schedule” stop (see route/schedule map on TriMet’s website) toward the outer end of the route (near Gateway Transit Center – such as 92nd and Glisan) and one closer to downtown (MLK & Couch may be a good choice). For inbound trips on Mondays, evaluate and compare the schedule adherence at these two stops. You should do some exploration to find days with bus bunching problems (where trajectory strings overlap).

In evaluating the TriMet BDS data for schedule adherence and bus bunching problems, you may want to consider the following:

- Describe the distribution of headways for buses on Route 19. How do the actual headways compare to the scheduled headway? How does this affect bus loading, assuming passenger arrivals at stops are random events?
- According to the Route 19 data, do schedule adherence problems tend to occur at particular times of day? How and why does bus bunching at the beginning of the route differ from that as the bus approaches downtown?
- Is it reasonable to expect that other similar routes face similar schedule adherence problems under these conditions?
- Part 3 of the Transit Capacity and Level of Service Manual provides guidelines for determining schedule-based level of service for bus systems.

REFERENCES