6-1-2011

Analyzing and Revisioning the Service Reduction Plan of Pierce Transit in Respect of Transit Equity

Jing Xiang Su

Follow this and additional works at: https://digitalcommons.tacoma.uw.edu/gis_projects

Part of the Urban, Community and Regional Planning Commons, and the Urban Studies and Planning Commons

Recommended Citation
https://digitalcommons.tacoma.uw.edu/gis_projects/49

This GIS Certificate Project is brought to you for free and open access by the Urban Studies at UW Tacoma Digital Commons. It has been accepted for inclusion in GIS Certificate Projects by an authorized administrator of UW Tacoma Digital Commons.
Analyzing and Revisioning the Service Reduction Plan of Pierce Transit in Respect of Transit Equity

Jing Xiang Su, University of Washington Tacoma

Pierce Transit is an agency that provides public transportation service for citizens in Pierce County. Due to budget shortfall caused by economic recession, the Pierce Transit Board of Commissioners decided to implement a 35% reduction in service by the October 2, 2011 service change to address the agency's budget shortfall. Almost all routes will be impacted with reduced service hours, the number of trips that operate, or service being eliminated. 22 routes have service hours reduced, 23 have service hour reduction and route modifications. 5 routes have been eliminated, and only 5 routes have no changes. Please see Pierce Transit Reductions Notification.

Applying the Reduction Plan is operational oriented instead of people oriented. Thus, in respect of the concept of Transit Equity, the goal of this project is to analyze the reduction plan and revision it based on the evaluation of Pierce County's demographic information. The goal of revisioning suggestions is to eliminated the negative impact caused by service reductions as much as possible and help Pierce Transit to serve citizens in Pierce County in a social-equity way.

The reduction plan in general will impact those areas provided with existing transit service in Pierce County. However, some areas will not be served any more as 5 routes are being eliminated, which will impact huge areas of Pierce County. The negative impact of this elimination is massive. But the impact caused by 21 route modifications is limited. That is, these routes will continue serving the communities, but at some areas service will be cut-off. Transit-dependent in service cutting off areas might be able to continue to enjoy the transit service by taking buses running through nearby areas. But anyway, their original daily lives will be impacted probably significantly due to loss of transit service.

Analyzing the impact of route modification with Network Analyst technique, areas within 20 minutes walking distance to existing transit service (bus stops) that being cut-off is marked. Please see Figure 1.

Reflection on the Figure 1, it is seen that most impacted areas of service being eliminated are in the City of Tacoma, in which communities in East, South, West Tacoma, Hilltop, 6th Avenue Business District, and Downtown are mostly affected. Some areas in the City of Puyallup and the City of Lakewood are impacted as well. However, these impacted areas are far from high population density, where citizens in Pierce County mayily reside, see Figure 2.

It has been argued that urban transit system should provide more transit service in city area where population is more concentrated instead of dispersed, low population density suburbs. Based on this, in this project being-eliminated transit services in high population density areas are identified and suggested to be preserved.

In this project, high population areas are identified as areas that with population density higher than the mean of that of Pierce County. By 1.5 standard deviation or more. 34 block groups are qualified for this selection. Also, 61 bus stops that being cut-off are identified. Some of them are completely located within highly populated block groups. Some of them are located right outside the boundary of these block groups.

These two groups of bus stops are believed serving the citizens who concentratedly reside in or near North Tacoma, Hilltop Tacoma, the Income Business District of Tacoma, and Puyallup Transit Center. Transit dependent living in red polygon, 10 minutes walking distance to preserved bus stops. If these areas will be preserved with transit service, citizen living there will be able to continuously enjoy transit service.

Figure 1: Areas Impacted by Route Modifications: areas of service being cut off

Figure 2: Population Density of Pierce County

Increasingly, public transit is considered as a social equity issue. Many researchers have argued that urban transit agency, planner and government should pay more attention on the mobility of social disadvantaged people. Providing them with adequate transit service can connect them with employment opportunities and further reduce social and economic segregation. The idea of transit equity is practiced in this project and suggest that Pierce Transit should look at the citizens who really need transit service in their daily lives before implementing the reduction plan.

Citizens who really need transit service are identified. They are elderly, low income, school students, disabled persons, and families do not own automobile. Using transportation techniques, distributions of those service-needed citizens are seen in Figure 4.

31 block groups are selected in Figure 4. The black block groups have the percentage of service-need citizen higher than the mean of that of Pierce County by 1.5 standard deviation or more. 101 being-cutoff bus stops are located in or just near by these block groups. These existing 101 bus stops are believed serving the transit-needed citizens in areas covered by red-hatches. Thus, it is here suggested that transit service in these areas should be preserved without cutting off a route modifications.

Figure 3: Areas That Should be Preserved with Transit Service Based on Service Need Density

Figure 4: Transit Service Need Density of Pierce County

Figure 5: Areas That Should be Preserved with Transit Service Based on Service Need Density

References


Please see Figure 5.