

# Vision Update – 2008-9- Chapter Four – Demand Review

## SERVICE IMPROVEMENT PROPOSALS

This chapter will utilize findings from the surveys that the DTA has taken over the last several months as well as a report of ridership based on the counters on the buses. This report presents a description of the route and service change proposals developed for the Duluth Transit Authority (DTA) services. Changes of varying magnitude affect many of the existing fixed routes. Also, a group of planning precepts guided the formulation of the proposals. These two components of service planning and development are discussed below. They are followed by the service proposals for DTA routes. The proposals developed focus on three main areas of concern. The first group of proposals addresses ways to improve the overall performance of the fixed route system as well as addressing specific issues where current service does not comply with the service guidelines developed for this study area. The second area of concern addressed services to the Miller Hill Mall – Arrowhead Road Area and the surrounding retail and employment establishments as well services offering mobility between these various establishments. The last section looks at Other Issues for the DTA to examine in the near future.

### Service Proposal Inputs

Eight major inputs were considered while preparing the route and service change proposals. Each of these inputs is briefly described below.

- \* **Community Characteristics** - A socioeconomic/demographic and land use characteristics review analysis was performed as part of the study process. The analysis builds on the comprehensive analysis of this same type that was prepared by the Metropolitan Interstate Committee (MIC) as part of the development of the Duluth-Superior Area *Transit Vision Plan*. The analysis included in the *Transit Vision Plan* provides a detailed description of what is referred to as attraction end transit trip generators (i.e., employers, retail centers, etc.) and production end transit trip generators (i.e., densely populated or developed areas, low income households, zero automobile households, elderly households, etc.). The analysis performed for this study makes use of the *Transit Vision Plan* and all of the data included therein. The Transit Vision study was updated with 1990 U.S. Census data to prepare the analysis and although the Duluth-Superior area has not undergone drastic demographic and socioeconomic change in the last decade, the analysis included in this study provides an update using year 2000 U.S. Census data for key characteristics which affect transit demand. The two major changes that have occurred since that time. One is the shift to more off campus housing and growth of the number college students within the Twin Ports. The second focuses on the Hope VI project where many families were moved out of a concentrated area and now where a smaller number are moving back. Morgan Park was the only community where a large percentage of these families were relocated to.
  
- \* **Passenger Survey and Public Input** - The service improvement proposals presented in this chapter were also based on an extensive bus rider and general public participation program completed as part of the study process. This program consisted of two on-board bus rider surveys, downtown bus stop surveys, telephone surveys of the general public as well as a DTA bus operator survey. All were administered by DTA with the assistance of interns from

## Vision Update – 2008-9- Chapter Four – Demand Review

UMD. There was also a public “walk-in” meeting process that was more focused on the Multi Modal Terminal Project. The first survey was the downtown bus rider survey which was developed to determine the bus riding habits and opinions of DTA riders traveling to and from downtown Duluth and using downtown facilities or bus stops. The second survey was the on-bus rider survey which was distributed to DTA riders on all routes throughout the system. This survey was performed to determine the travel habits of DTA riders in general and their opinions regarding DTA services and needed improvements. Next came the Telephone Survey. Here, residents through out the greater Twin Ports were surveyed. This included people as far north as Two Harbors and as far south as Cloquet. All data from these two surveys was assembled and tabulated by DTA staff and they are included in the appendices.

The fourth component in the effort to elicit public input was the Multi Modal Terminal walk-in meeting process. Members of the consultant team were available at the downtown transit center for a two hour period during a weekday in February, 2009. DTA riders and the general public at large were made aware of this and were informed that they could “walk-in” to this meeting at any time during the four hour period to give their input into the study process. This generally consisted of their opinion of DTA services and the needed improvements to services or downtown facilities. Participants were also informed that they could offer input at any time by mailing, e-mailing or calling DTA with their comments. Participants were provided with the applicable mailing address, phone number and email address.

Lastly the DTA also surveyed the DTA bus operators. This survey not only asked for routing information but also comments on working at the DTA and the types of equipment used by the DTA.

- \* **Committee Participation** - Throughout the study process, the consultant team worked with and discussed the study with a large group of people that included technical staff, planning staff, as well staff and members of the Hospital Community, UMD, downtown and business communities. This committee was designated to work closely with the consultant team to review all data, interim reports and potential recommendations.

The second committee designated to work with the staff throughout the study process was the DTA Board of Directors. The Board of Directors in its roll as overseeing DTA had overall control of the study and its direction. A half day meeting was conducted to inform the Board about many aspects of the DTA. Then a SWOT analysis was conducted with the Board to focus the study overall.

- \* **Service Evaluation Analysis** - Various interim reports were prepared that document the performance of the DTA system and its routes for a number of measures. A set of service standards were developed and the performance of the DTA system was compared with the standards to determine service adequacy. This also included a review of the routes using the TDP Criteria developed by the Board. Individual route data on farebox recovery and passengers carried per revenue hour of service were used to demonstrate the productivity of the individual routes. An extensive data gathering effort was undertaken by DTA to

## Vision Update – 2008-9- Chapter Four – Demand Review

complete a comprehensive ride check survey of the fixed route system. Each weekday trip was surveyed three times in October as well as April of 2008. Weekend trips were surveyed twice in both of those months. This survey provided the number of passengers boarding and alighting at each DTA bus stop on each trip for all routes. This data was instrumental in assessing the performance of routes and route segments as well as in developing the service improvement proposals. The tabulated data for each DTA fixed route is provided in the Appendix of the final report.

### Service Design Principles

When analyzed together, the inputs mentioned above effectively expose the areas where improvements are needed in a transit system. For some transit systems, the analysis of these inputs demonstrates a need for new services to major trip generators while at other transit authorities the analysis shows that current services provide good coverage throughout the service area but improvements could be made to that service. The latter is the case for DTA. The analysis of many of the inputs listed above (service coverage analysis, bus rider surveys and the public “walk-in” meeting process) showed that there are no major areas or destinations in the Duluth-Superior area that should receive transit service but currently do not. However, certain destinations could be served at a more enhanced level or through more direct connections. Also, some of the current services failed to meet the suggested standards for route productivity or the simplicity of route structure. Building upon the results of these analyses, the following service design principles were employed to guide the development of various service improvement options.

- \* **Convenient Connections** - One service aspect that should be evident in all transit systems is direct and convenient connections between the major production end generators and the major attraction end generators in the service area. When these connections do not exist, transit travel time for these popular trip patterns can be much higher than automobile travel time, thereby diminishing the overall convenience of the transit system. Also, the lack of these connections often makes it necessary for large numbers of passengers to transfer between buses to complete their transit trip. This again reduces the directness and convenience of the system. Upon analyzing the DTA fixed route system, it was observed that DTA provides good service coverage to the transit trip generators in its service area, that is, almost all major origin and destination points are served by a DTA fixed route. However, in a few instances, there was no direct connection between major production end generators (origins) and major attraction end generators (destinations). To remedy this the DTA created the West to the Mall Route #5. This route serves the west mainline area and then goes to the mall via Piedmont and Trinity Road (thus serving Lake Superior College). The Mall shuttles actually will work against this principle. However, with the number of attractions and the road construction in the area this is the preferred choice. Another need that emerged with the increased University ridership was direct service from all over Duluth to the UMD. The DTA instituted a new #6 Route from Downtown to the U. This route was then tied to other routes so as to provide direct routing from all over Duluth to the University. The Canal Park route 15C was also created in such a fashion, but it has not worked as well. In part this is due to half hour service and the fact that people walk to that area faster because of its proximity.

## Vision Update – 2008-9- Chapter Four – Demand Review

- \* **Simplicity in Route Structure** - Another important aspect of a transit system is to have route schedules and structures which are easy for passengers to comprehend. It is difficult to retain current passengers or attract new passengers when many find the services offered to be too complex. One contributor to the complexity of a system is the number of variations included in each route schedule. The service guidelines used in this report to assess the adequacy of DTA services stated that no route schedule should include more than three variations. As noted in the Service Adequacy chapter, various DTA routes fail to meet this service guideline. For the convenience of current and potential passengers, excessive routing variations should be eliminated wherever possible.
  
- \* **Use of Appropriate Service Models** - Many transit authorities are incorporating alternative service models into their operation to cover periods or areas of light demand. Very often the service model introduced is a demand responsive service. In many cases, however, these alternative service models do not markedly increase the convenience of the service, can increase the travel time for existing riders and often do not reduce the amount of resources necessary to offer service. A detailed analysis of ridership patterns and resource needs was performed to determine the most appropriate service model given the existing and potential demand. Therefore, no new service models or any dramatic service changes were recommended for periods or areas of light demand unless the proposal saved resources (i.e., necessary vehicles) and did not adversely affect DTA's ability to meet demand. This was adhered to specifically during the development of proposals for night services and service around the Miller Hill Mall. The only area that is borderline for this is the Billings and South Superior area during off peak and weekends. Those areas do not have high ridership during the peak either, but the inconvenience factor would be large for people who are going to work.
  
- \* **Arrival and Departure Time Analysis** - As more and more destinations are being served along a route it is more difficult to serve all of them at their precise peak time. As an example the hospital area and downtown have many similar start times. An ideal time for a bus to arrive at a site for an 8:00 am start would be 7:45 am. Buses coming from the east or west can serve either the downtown or the hospital area at that time but not both. It is imperative that buses service either site for an 8:00 am start must be there no later than 7:50 real time, not scheduled time. An analysis of system times will be taken in late 2009.

These service design principles have been incorporated, in varying degree, into the development of three service improvement plans presented below. The following sections describe, in detail, the specific proposals comprising these plans and how they build upon the analyses performed and the design principles described above.

### **Service Improvement Plans**

This section presents the service proposals on a route level basis within three separate plans. Each of these three plans (Fixed Route Service Enhancement Plan, Miller Hill Mall Area Service Plan and the Other Service Plan) addresses one of the three areas of concern discussed above. The proposals included in each of the plans are designed to improve the efficiency of service and ridership performance of DTA's fixed route system by building upon the service planning

## Vision Update – 2008-9- Chapter Four – Demand Review

components.

- \* **Fixed Route Service Enhancement Plan** - As part of this study, the adequacy of current fixed route services was analyzed using an established set of service guidelines. Based on this analysis, a set of recommendations was developed for certain fixed routes in Duluth. The Fixed Route Service Enhancement Plan consists of each of these recommendations. This plan includes service change proposals designed to address specific instances in which current routes did not meet one or more of the service guidelines developed for this study.
  - Route 6/7 - East Mainline – Connections at 24<sup>th</sup> Ave. East for these two routes need to be improved. As ridership to UMD continues to grow this is an important connection to be made. A priority here are the trips serving major start and ending times. Additionally, the one hour headway in the mid-day on the #7 route is too long and complicates the connections. Headways on this route should be lowered to 30 minutes in the mid-day. Ridership between 24<sup>th</sup> Ave. and Downtown is sufficient to support 15 minute headways. The ideal situation is that out going #6 buses would meet incoming #7 buses and vice versa. While at the same time proving an equal 15 minute headway from 24<sup>th</sup> Ave. East to downtown.
  - West Mainline – Ridership continues to grow in area between Spirit Valley and downtown. Last fall buses reached over-capacity issues even on Saturdays. Fifteen minute headways are needed throughout the week days. Route 5 improvements are also needed to assist with the ridership in this area.
  - Route 8 – Fitgers – This route has not built any significant ridership. This route should be discontinued and service allocated to where it will be better utilized
  - Route 15 - Park Point – The 15c route needs to be reviewed. Ridership has not warranted maintaining this route.
- \* **Miller Hill Mall Area Service Plan and Airport/Air Park Service Plan**- The Miller Hill Mall and the numerous employment and retail sites along the US Highway 53/Route 194 corridor present various service related problems for DTA. Additionally there has been significant growth along Arrowhead Road as well as Air Park and Airport area. It has been a challenge to develop a service plan which adequately and effectively serves the Mall and the surrounding employment retail sites in a direct manner without creating circuitous routes or adding excessive amounts of running time to the fixed routes serving the area. United Health and Cirrus are the prime examples of this. At the same time road construction in the area for the next several years requires a more flexible route system. This is needed to maintain our consistent schedule that riders can depend on.
  - Route 5 - West to the Mall – This service has been successful, but needs some fine tuning. The first bus does not provide for an 8 am start time in the Mall Area and it needs to. This route also needs to operate on Saturday, in part to alleviate the passenger loads on the mainline. This route will also continue on from the

## Vision Update – 2008-9- Chapter Four – Demand Review

Mall to serve WalMart, Air Park, and the Airport.

- Route 10 - Duluth Heights - This route will continue to serve the Mall under Stone Ridge routing to Door 8 at the Mall. The Home Depot side of the route has not been successful and has created problems with people trying to cross Central Entrance. By stopping at Door 8 this route will only minimally be affected by construction issues over the next several years. The Mall proper accounts for about 52 percent of the ridership in the Mall area. The Target and Kmart are the next biggest attractions. Then a circulator route(s) needs to be established. Route 5 also plays into this as six days a week it will provide the service to WalMart, St. Louis Count facilities, as well as the Airport.
- Arrowhead Road – Air Park – Airport – Cirrus: - This route has been receiving JARC type funding. The ridership is heaviest in the AirPark area. This is long route with one way ridership. For this route to become successful it must be a two-way route, this means that a Park and Ride facility is needed with express only service to and from downtown. The risk with this is the current budget shortfall. Should finances become strained this route as it currently operates would be recommended to be dropped.

### \* Other Issues

Other service issues were analyzed as part of this process but the final recommendations regarding these issues were that no action should be taken. The following paragraphs describe these issues.

- **Superior Service Model** - The major issue in the development of an improved service model for Superior is the fact that the desired origins/destinations and current ridership activity are located in such a manner that serving these points with two bus routes inevitably creates circuitous services. The MIC, DTA and City of Superior need to rework and evaluate different service models for this area. At the same time the one bus STRIDE system seems to be meeting its maximum capacity. This needs to be examined at the same time.
- **Downtown Circulator** - The geography and transportation network in downtown, presents some difficulties. There are three main areas of demand; the downtown proper, the hospital area, and the DECC waterfront area. Each has a differing set of demands. As part of the Multi Modal Terminal study the DTA needs to effectively develop an overall service model.
- **Rail Integration** – The potential for commuter rail into the Twin Ports has never been greater. This service could have multiple trips per day with the schedules timed to trip purpose. It is projected that peak hour services would be timed to the metro area work schedules, which could result in the Duluth area becoming a bedroom community for the metro area. Passengers riding during off peak times would have a different trip purposes and would require extensive coordination

with other transportation modes including DTA bus services. The DTA needs to coordinate with St. Louis County and the City of Duluth on the development of the new depot and be flexible enough to provide high quality services to the site either in the form of direct bus service or high quality pedestrian services.

- **Extra-Urban Services** – At this time it does not appear that there is enough demand for DTA services outside the core cities. The exceptions here are paratransit service within the first third of Hermantown as well as Park and Ride services in Miller Trunk corridor, South I-35 corridor, and the East Superior area.
- **Bus Operating Times** – The DTA needs to look at arrival and departure times through out the system as well as the running times for routes. Currently scheduling running time is done by large time blocks. This needs to be reviewed. Some of the run time issues that have been experienced have been tied to passenger overloads and wheelchair boardings. These are not always consistent. The DTA needs to use the ITS data system to logically look at run times. There may be instances where it is overall more efficient to fill in trips than add additional time into the system. This must also be evaluated with the advent of a downtown Multi Modal Terminal as recovery time might be moved there instead of the end of the line. This also has an impact on the “clock” headways that the DTA offers.

## **Summary**

The service proposals described above build on the service input and service design principles discussed at the beginning of the chapter. The chapter also provided the impacts of each of these plans in terms of vehicle requirements. Specific follow up needs to be done on the City of Superior bus system, arrival-departure time analysis, as well as final determination on the Routes 8 and 15c.

## **SERVICE IMPROVEMENT PROPOSAL IMPACTS**

The following pages provide a visual depiction of the service improvement plans as well as a description of the impact the plans would have on DTA’s peak vehicle need.

### **Fixed Route Service Enhancement Plan**

The figure below depicts routing changes included in the Fixed Route Service Enhancement Plan. The chart below shows the impact of these proposals in terms of peak vehicle requirements.

#### **Fixed Route Service Enhancement Plan Impact on Peak Vehicle Requirements**

**Miller Hill Mall and Arrowhead Road Area Service Plan**

Figure 8 depicts each of the services that would serve the Mall as well as the retail and employment sites in the immediate area. Route 10 is depicted using the outbound routing along Superior Street and Mesaba Avenue, however, its current routings to and from downtown would be maintained. The chart below shows the impact of the Miller Hill Mall Area Service Plan in terms of peak vehicle need.

**Miller Hill Mall Area Service Plan  
Impact on Peak Vehicle Requirements**

Route	Peak Vehicle Requirement	
	Current	Proposed
5 – West to the Mall	0	1
10 - Duluth Heights/Mall	2.5	3
<b>Total</b>	<b>2.5</b>	<b>4.0</b>

These proposals result in a net increase of 1.5 peak vehicles. It is believed, however, that new resources are necessary to adequately and effectively serve this corridor, which is the largest hub of retail activity in the service area.

**Future Studies Needed**

- City of Superior Service
- Downtown Circulator
- Extra-Urban Services
- Arrival, Departure, and Run Time Analysis