

VALUE OF DEDICATED RUNNINGWAYS

This memo describes the application and benefits of dedicated median runningways for bus rapid transit (BRT) in Saskatoon.

Introduction

Bus Rapid Transit (BRT) combines select elements of buses, transit priority measures, runningways, stations, passenger information and fare collection technology into an integrated system that provides operational speed and reliability advantages, a positive customer experience and a unique powerful marketing image to support development of the transit market as well as adjacent communities.

Types of Runningways

BRT system planning includes the assessment of existing roadway and traffic conditions to determine if the bus should run in mixed traffic (see Figure 1) or in an dedicated transit-only runningway. Runningways may be located within the curb lanes on each side of the street or in the median of the street (see Figure 2). Median runningways may operate with general traffic flows or contraflow (see Figure 3).

Dedicated runningways separate buses from auto traffic and when applied in conjunction with transit signal priority, provide improved bus travel time and schedule reliability. The provision of dedicated passenger boarding platforms, shelters and station amenities (such as radiant heat, real-time information screens, public art...etc), significantly improves customer comfort and appeal.

Along streets with high volumes of traffic, parking and transit customer activity, dedicated runningways are generally provided along the entire length of the corridor. However, it is important to balance the capital investment in runningways with the benefits gained to bus flow and passenger comfort.

Along corridors with lower traffic and transit activity, the BRT may run in mixed traffic. The application of an

dedicated runningway may be implemented in the future, as the corridor develops and transit ridership along that segment increases.

Runningways in Saskatoon



Figure 1. Mixed traffic runningway in Austin, TX.



Figure 2. Dedicated with-flow median runningway in York Region, ON



Figure 3. Median contraflow lane in Taipei.

Each city is unique and requires a unique design response. Overall the Saskatoon BRT system should be developed based on the application of the appropriate design elements: transit signal priority measures, geometric roadway improvements, stations, customer systems, and runningways. Combined, these design elements and the intensity of their application can achieve excellent transit service outcomes within an appropriate budget. The current plan for BRT in Saskatoon is to develop a system to serve the community today, that forms the backbone of a renewed transit service and can be expanded to serve future needs as required.

Within the Saskatoon context, dedicated runningways are recommended for the following corridors: College Drive, Broadway Avenue and 3rd Avenue (1st Avenue). The reasoning for dedicated runningways along these segments is supported by traffic and bus flow analyses and benefits to transit customers.

The College Drive runningway was defined based on the higher traffic speeds and volumes along College Drive, as well as the high passenger volumes generated by the Hospital and University. The College Drive runningway provides benefits due to the segregation from traffic and a safer and more comfortable passenger environment.

The Broadway Avenue runningway was defined based on the benefits of segregating BRT from the traffic and parking activity along the street and the creation of a unique and more comfortable passenger environment within one of the more interesting areas in the city.

The 3rd Avenue (1 Avenue) runningway was defined based on the benefits with segregating BRT from the

traffic and parking activity along the street, and the creation of a unique and more comfortable passenger environment within one of the highest transit customer activity areas within the City.

Additionally, dedicated median runningways along Broadway Avenue and 3rd Avenue preserves limited sidewalk space for pedestrians and storefront activities. An example of a BRT station constraining sidewalk space is from St. Paul Minnesota, in Figure 4.

In the future, increases in traffic volumes and congestion, as well as increases in transit passenger volumes will trigger the consideration of extending or creating new dedicated runningways sections. The creation of new or extension of dedicated runningways would be based on benefits to bus flow and schedule reliability, and improvements to the transit customer environment.

Benefits of Dedicated Median Runningways

Transit Travel Time and Reliability

Dedicated runningways contribute significant travel time and schedule reliability benefits by eliminating conflict with curb-side parking, stopping / loading vehicles and right turning vehicles. Additionally, BRT dedicated runningways and stations are unlike the current transit mall as buses will not be able to dwell at stations.

The Red, Green and Blue BRT have a combined route length of 47 km and with the route overlap in some sections a street corridor length of 38.3 km. There are three sections of dedicated runningways which have a combined length of 3.4 km (9% of total corridor). The application of transit priority measures (including dedicated runningways, queue jumps, and transit signal priority measures) reduces the Red, Green and Blue BRT route travel time by 8.2 minutes, 7.5 minutes and 5.3 minutes, respectively.

Although the travel time savings are important schedule reliability or certainty of bus arrival and transfer times is of critical importance to customers. The added benefit of transit signal priority (TSP) alone is an approximate 40% reduction in schedule variation which ensures buses arrive on time more often.

Based on traffic modelling of existing and future (with BRT) conditions, the three dedicated runningways are only 9% of the corridor length, they contribute 4 minutes or 20% of the total travel time savings and 24% of the schedule reliability improvements.

Parking and Loading Activities

Compared to curbside dedicated runningways, median runningways frees more curb space for parking, loading activities, and traffic circulation.

Traffic Benefits

Median runningways segregate transit and traffic, and improves the flow of both modes.

Transportation Demand Management

BRT runningways and stations bring more people to the street in less space than other modes. Adding a BRT runningway to an existing auto corridor significantly increases the overall people moving capacity of the corridor.

Future Proofing the Transit System

BRT median runningway options “future proof” the corridor for the possible future implementation of modern streetcar or LRT.

Placemaking and Wayfinding

BRT median stations are more visible, more accessible and less confusing for transit customers. BRT median stations create a highly visible, welcoming, safe, comfortable environment for transit customer which puts people ahead of cars. BRT stations encourage place making with a captive market and higher concentrations of pedestrians. BRT runningways and stations will distinguish and differentiate the corridor as a unique destination.

Safety

BRT median stations improve pedestrian safety. Median stations provide a pedestrian refuge and shorten roadway crossing distances and single direction auto travel. The attraction of greater numbers of transit customers and pedestrians to the BRT corridor will create more “Eyes on the Street” and improve community safety. Dedicated runningways can also provide for faster response times for emergency vehicles.

Development and Retail Activity

BRT provides greater connections along the corridors and will attract a higher number and broader cross-section of transit customers. This will create new opportunities and greater economic activity along the corridor. BRT median stations create overall greater pedestrian space within the corridor and frees sidewalk space for pedestrian circulation and commercial activity.

The development industry responds more positively to the implementation of dedicated runningways infrastructure over curbside bus stops, as the infrastructure and investment required for dedicated runningways is

regarded as more permanent and long-term.

In addition to bus travel time and reliability, dedicated runningways serve a marketing function. New BRT systems in developing or reconfigured transit systems signal significant change in the priority and investment in the transit market. Unique transit infrastructure can be a powerful marketing tool to support the development of the transit market and adjacent lands.