



## **BIKE-MAX SURVEY**

**2007-08**

**TriMet Bike Programs  
June 2008**

## Background

Bikes have been allowed onboard TriMet MAX light rail trains without permit or time of day restrictions since 2003. Every MAX light rail vehicle provides space for bikes at all hours of operation and 300 bike lockers provide long-term bike parking at stations.

According to a recent national study<sup>1</sup>, integrating bikes and transit:

- Extends the range of transit
- Provides greater mobility options to customers at the beginning and end of their transit trips
- Has the potential to increase transit ridership
- Encourages cycling by giving cyclists the option of avoiding unsafe streets, hills, fatigue, and poor conditions (darkness and weather) if bikes are allowed onboard
- Has the potential to decrease congestion and help reduce air pollution by providing an alternative to driving

A Dutch government publication states: “The combination offers great advantages: the bicycle carries the traveller without any waiting from the front door to the station (which public transport generally cannot do) and public transport then takes the traveller quickly and comfortably over greater distances to the destination (which the bicycle does with difficulty). Thus the two modes resolve each others’ weaknesses, together forming a strong chain.”

In the Portland region, use of each mode is growing rapidly:

- More people are riding transit:  
Weekly ridership on both TriMet bus and MAX light rail has increased for 19 consecutive years<sup>2</sup>. TriMet ridership jumped 12% for the AM peak (7am to 9am) in April 2008 compared to April 2007.
- More people are riding bikes:  
Between 1991 and 2006, the number of bicycle riders crossing the four bicycle-friendly Willamette River bridges daily increased 322%. Bicycle use on these four bridges increased 21% from 2006 to 2007, following an increase of 18% between 2005 and 2006<sup>3</sup>.

These trends combined with policies allowing bikes onboard trains have resulted in an increasing number of bike-on-light rail trips. Comments received by TriMet suggested that many customers were bringing bikes onboard, especially during peak hours; at the same time, bike parking available at stations was underused. As current data on bike-transit ridership in the region did not exist, this study was undertaken to gather data on when, where and why customers with bikes rode MAX light rail. This data will be used to develop a Bike Facilities Plan that will recommend specific ways to encourage and integrate bikes with transit while minimizing conflicts.

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<sup>1</sup> *Integration of Bicycles and Transit, Transit Cooperative Research Program (TCRP) Synthesis 62*; Transportation Research Board, 2005

<sup>2</sup> *Facts About TriMet*, TriMet, 2007

<sup>3</sup> *Portland Bicycle Counts 2007 and 2006 City of Portland Bicycle Count Report*, Portland Office of Transportation

## Executive summary:

### Survey Methodology

The study had three components: an onboard intercept survey, a web-based survey, and counts of bikes and passengers intercepted onboard MAX light rail trains. As the sample of respondents to the web-survey was self-selected, figures for the onboard survey are referenced more frequently in this report. Both surveys were administered in August 2007. Bike and passenger counts were taken in August and November 2007 as well as in March 2008.

### Onboard Survey highlights

An estimated 2,100 passengers rode MAX light rail with a bike on weekdays during August 2007, accounting for 3.8% of all passengers. Bike counts dropped off in November (1,600 trips each weekday) and March (1,200 trips each weekday). Passengers with bikes account for a significant portion of Interstate Yellow Line ridership, especially at the PM peak (10% of all riders inbound to and 14% outbound from Portland City Center from 4pm to 6pm weekdays had a bike) as well as for reverse commuters on Westside MAX trains outbound from City Center during the AM peak (10% on the Blue Line and 8% on the Red Line from 7am to 9am)<sup>4</sup>. Demand for bike space is concentrated at peak hours and especially during the PM peak. On weekdays in August, almost half (47%) of all bikes counted were intercepted during peak hours and 29% were intercepted between 3 and 6pm<sup>5</sup>. One-quarter of all light rail vehicles intercepted at peak hours carried three bikes or more. Most light rail vehicles have 4 designated bike spaces available at peak hours<sup>6</sup>. At Goose Hollow, half of vehicles intercepted during the PM peak on the inbound Blue Line carried four bikes or more. Half of Yellow Line vehicles intercepted at the PM peak in both directions carried four bikes or more.

Passenger counts were also highest at the PM peak: average passenger loads per vehicle<sup>7</sup> ranged from seated capacity<sup>8</sup> to 50% over seated capacity on the MAX Red and Blue Lines – both inbound to and outbound from Portland City Center. Highest recorded passenger loads approached achievable capacity<sup>9</sup>.

Bike-on-MAX customers made trips that would likely not be made by bike alone (77% of all respondents cited that the distance of their trip was too far to bike<sup>10</sup>). Most trips were work-related (64% of all trips, including weekends). Respondents biked an average of 2 miles at each end of the transit trip. As a result, more than three-quarters (76%) cited that they needed their bike to reach their destination and indicated that they were not

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<sup>4</sup> A high percentage of bikes is in large part due to the fact that MAX passenger loads are relatively light on trains outbound from City Center during in the AM peak

<sup>5</sup> Counts and surveying took place from 7am to 6pm on weekdays

<sup>6</sup> Low-floor light rail vehicles (LRVs) have 4 bike hooks. Bikes may be stored in priority seating areas when available. High-floor LRVs (19% of surveyed vehicles) have 5-6 designated spaces.

<sup>7</sup> A MAX light rail train consists of one or two vehicles

<sup>8</sup> Seated capacity of a MAX light rail vehicle is 64 passengers

<sup>9</sup> Achievable capacity of a MAX light rail vehicle is 133 passengers (seated and standing)

<sup>10</sup> SCALE: *Very Likely, Somewhat Likely, Neutral, Somewhat Unlikely, Very Unlikely, N/A*

willing<sup>11</sup> to use secure bike parking at their boarding station instead of bringing their bike onboard (13% 'yes'). This was especially true for those intercepted at peak hours (only 9% 'yes'). For the MAX system, bike-transit-bike trips appear to be more common than bike-to-transit trips, as the estimated number of passengers riding MAX light rail with a bike (2,100 in August 2007) far exceeds the number of long-term parking spaces available at stations (340 spaces). Combining bikes and MAX also appears to reduce auto travel (38% of respondents intercepted at peak hours would drive it they could not bring their bike onboard).

## **Web Survey highlights**

### **Current customers:**

Almost all (94%) respondents took their bike onboard on their most recent trip (only 6% parked their bike at a station). Though only 18% of current bike-MAX riders indicated that they would park their bike at their boarding station (if secure parking was available) instead of bringing it onboard, 49% were willing to use a free- or low-cost rental bike and 41% were willing to park a bike at their alighting station<sup>12</sup>. This finding underscores the importance of having a bike at each of the transit trip. Most respondents did not make frequent bike-MAX trips (37% made bike-MAX trip at least once a week).

### **Potential customers:**

In contrast to current bike-MAX customers, almost half (46%) of potential customers that would travel during peak hours would be willing to use bike parking<sup>13</sup>. All respondents in this sample indicated that they do not currently commute by bike or transit.

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<sup>11</sup> SCALE: Yes, No, Maybe

<sup>12</sup> SCALE: Very Likely, Somewhat Likely, Neutral, Somewhat Unlikely, Very Unlikely, N/A

<sup>13</sup> SCALE: Yes, No, Maybe

## Recommendations

Allowing bikes onboard at all hours provides a lifeboat for cyclists - reassurance that they have a backup option in case of fatigue or mechanical issue. It also provides flexible mobility options at each end of the transit trip. However, several factors constrain expanding existing space dedicated to bikes onboard trains. The principal constraint is the space required to serve the growing number of passengers at peak hours. Additionally, the design of the MAX light rail system limits the length and number of trains in service. *Frequently Asked Questions about bikes on MAX* lists service and design constraints.

As Portland's bike and transit systems mature, new alternatives will need to be explored. To increase the number people accessing MAX light rail at the time of their choice, facilities or programs that would allow cycling at each end without needing to bring a standard size bike onboard are necessary. This is true not only for current but for potential customers. Improved bike facilities would also allow more customers to make bike-to-transit trips. No one solution will work for every customer, but providing a range of bike-transit options and facilities will encourage many more people to combine bikes and transit than could be accommodated onboard transit alone.

Extensive bike parking facilities have made cycling the principal mode of access to transit in countries with mature bike and transit systems, despite the fact that standard size bikes are generally prohibited onboard trains. In the Netherlands, bikes are used as transport to the station for 33% of all rail transit<sup>14</sup>, while a more modest number of passengers ride a bicycle to travel from the station to their final destination (one in ten in 1992<sup>15</sup>). A small proportion of passengers take a folding bike with them on the train<sup>16</sup>.

The following planning and immediate actions are recommended:

### Planning recommendations:

- Develop and implement a Bike Facilities Plan that includes extensive short-term and long-term bike parking at stations, including facilities for customers that need a bike at each end of their trip.
- Consider bike transport impacts in future MAX light rail service improvements and develop tools for predicting or modeling future multimodal demand.
- Explore options to provide additional bike-on-bus capacity and bike-to-bus facilities

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<sup>14</sup> *Cycling in the Netherlands*, Netherlands Ministry of Transport, Public Works and Water Management, 2007; 42

<sup>15</sup> *Bicycle Access to Public Transportation: Learning from Abroad*, Reploge, Michael; Institute for Transportation Engineers Journal, December 1992; 2. Original source: Netherlands National Railway Summary (NS), *Summary of Bicycle Policy Memorandum*; 1

<sup>16</sup> Netherlands Ministry of Transport, Public Works and Water Management, 2007; 42

**Immediate actions:**

During the planning and implementation phases, it will be necessary to increase the amount and improve the usage of existing facilities.

- Increase usage of existing bike lockers through more efficient management of the program and by relocating lockers to stations where usage is highest.
- Improve bike transport onboard MAX by making improvements to designated bike spaces, adding signage to specify that passengers allow cyclists to store their bikes in designated spaces, and make bike transport options in seating areas more flexible.
- Clarify customer information so that customers can better evaluate existing options including: how to transport bikes onboard, what kinds of conditions to expect, and bike parking. Partner with manufacturers and retailers to promote folding bikes.
- Make investments in bike parking where possible, given limited resources.