Appendix C: Bike on Bus Memo

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MEMORANDUM

To:

From: Chava Kronenberg

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Subject: Bike Trailer Options for Zion National Park

The existing method of visitors transporting bicycles in Zion National Park is the front-load bike rack, with two bicycles per bus capacity. However, with the growing popularity of cycling as a sport and better awareness of using transit to transport bicycles, the opportunity to move bicycles to the Park in greater numbers should be reviewed.

Zion Canyon Shuttle with Front-Load Bike Rack

Background

Many transit systems in the States, including the Zion Canyon Shuttle, use the front-mounted bicycle racks with two-bicycle capacity, as shown. However, once these racks are full, visitors with bicycles must wait for the next bus, which hopefully does not have a full rack. Some of the early concerns from both bicyclists and transport providers (and the bus drivers themselves) are primarily 'ease of use' concerns. Bus drivers do not want to become responsible for loading and unloading, and users often find there to be a great deal of pressure to load and unload the bicycle quickly, making it a stressful situation for all involved.

The majority of stakeholders have found with user education and outreach (including numerous PSA and opportunities for cyclists to practice putting their bike on a bus rack) that these racks have proved enormously successful. To use these racks, the cyclist lifts up on the middle bar to drop the bike rack down, places their bike in one of the two bike slots, and lifts the lever to secure the wheel. This takes about one minute, maximum, for a user familiar with the system.

Finding better methods of transporting more bicycles within the Park and on the shuttle service will give the shuttle more appeal for cyclists and allow all visitors to bring their bikes to the park. Any new system should be easy to understand for new users, easy to access for bicycles being loaded/ unloaded at a variety of bus stops, and safe for operators. Below are a number of possibilities for such a system.

Pendle 6- and 12- bike trailers

Burtech trailer, fits between 6 to 20 bicycles

Bike-Bus circa 1960s

Hippie Transport

Unfortunately, Zion Canyon Shuttle Service probably can't use the Bike-Bus model for potential bike capacity expansion due to general safety concerns and loading/ unloading difficulties. But perhaps in the future!

Trailer Systems

More popular options for multiple-bike transportation are 6- and 12- bike trailers, loaded behind trucks for the purpose of moving multiple bicycles at a time.

Pendle, a United Kingdom-based manufacturer, sells these trailers According the website, "bikes are separated by tilting vertical supports, which the frames rest against. They are then held securely by straps, therefore maintaining them in an upright position to ensure safe transport." As these are primarily used for transporting multiple bikes from one distinct location to another, it is unclear as to how difficult it might be to remove one bicycle on the rack amidst others. These range in price from £635.00 (~US $1,100) for the 6 bike trailer to £1980 (~US $3,430) for the 12

bike trailer, though these costs might be much higher for transport to the States.

Burtech, another UK-based manufacturer, makes a trailer that can accommodate between 6 and 20 upright bicycles. According to the website, the bicycles are "individually held and accessible" and are "secured by a single strap looped around the handlebar." Depending on the type of brakes and the number of bicycles spaces needed on the system, the prices vary from £1,466 (~US $2,540) to £2,326, (~US $4,030) with no accounting for transport to the U.S.

For both of the reviewed systems, it is unclear whether bicycles can be loaded by individual passengers with some understanding of these systems, or whether the complexity will require bus operators to assist visitors with loading and unloading. Further, it is unclear as to the difficulty of removing bicycles at different stops.

CalTrans has a bicycle shuttle that runs across the Bay Bridge during peak commute hours from both Oakland and San Francisco. This service exists as a compliment to buses that run across the bridge with front loading bike racks, with a passenger van pulling a bike trailer loaded by the operator. Other programs include a tourist shuttle service in southern England operated from 2002-2003 that had a 24-bike "specially designed" trailer for the purpose of delivering tourists and their bicycles to local parks. It appears that this bus no longer runs, but further inquiry might be valuable.
(http://www.durham.gov.uk/durhamcc/pressrel.nsf/Web+Releases/537D6024CF78B87680256BC000555030?OpenDocument)

Dedicated Bicycle Transit Cars

Popular on train systems that have high demand from bike users that may use bicycles on either end of their commute. Demand often out-strips supply and these dedicated cars have become sources of conflict in the Bay Area and Portland, OR. However, they have been very effective in safely and efficiently transporting both bicycles and their users. The bikes-on-transit database is a comprehensive data source on all transit agencies and their bicycle accommodations. (http://www.bikemap.com/bikesontransit/)

CalTrain Dedicated Bicycle Car

Caltrain has dedicated an entire car on a number of its routes from San Francisco to San Jose for bicycles only. The Portland MAX light-rail has hanging bicycle racks that accommodate two bicycles per train car. Boston MBTA commuter rail cars have been re-fitted to accommodate up to 39 bicycles in a car shared with sitting passengers. These are all easy to use for cyclists, involve no assistance from operators, and keep bicycles enclosed and safe, but are space consuming- each bicycle can take up to one person space or more.

MBTA Commuter Rail Bicycle/ Passenger Car

Hanging racks are popular as a space-saving measure, but require more maneuvering space to get them up and down, and take time to remove during alighting, a space versus time trade-off.

Critical Considerations:

Portland MAX hanging bike rack

Cost: Trailers are significantly less expensive than dedicating an entire bus or portion of a bus to bicycles and their users. It is probable that creating a specially designed trailer for the Zion Canyon shuttle will probably remain less expensive than the addition of on-board bicycle buses.

Easy Loading/ Unloading: In order for any system to be effectively implemented, bus operators must be assured that they will not be involved in the loading and un-loading of bicycles process, and users must be able to understand and easily use the mechanism without assistance. There must be clarity in using the system (what do I have to do next?) and needs to not be time-consumptive in order to maintain existing schedules. Providing education to both bus operators and bicyclists prior to using the system will minimize these difficulties.

Easy Access to Bicycles: The ability for passengers to retrieve their bicycle at any station is a necessity. It is unclear whether the existing trailers allow for such a maneuver.

Safety/ Security – Bicyclists like to know that their bike is secure on the rack, and that there is limited potential for others to take a bicycle that is not theirs. Though bicycle theft off of racks is unlikely, the ability to keep an eye on the bicycles is appreciated by cyclists.

Weight and Hauling Capabilities: A fully loaded bike trailer is not an insignificant amount of weight. Hauling fewer bicycles reduces this weight. An analysis of the towing capacity of Zion National Canyon Shuttle services might be useful.

Findings and Recommendations:

Clearly, the difficulty of transporting bicycles on space-limited transit service beyond front-load racks has been encountered in many communities. The solutions are often creative and require both effort and initiative.

There appear to be two options for NPS Zion to increase bicycle capacity on its buses:

1. It can switch out the existing front mounted bicycle rakes from 2 slot racks to 3 slot racks, thus increasing capacity by 50%. This would cost about $1,500 per bus including labor. It would be relatively easy and inexpensive but it might not be worth the effort, given that the carrying capacity per vehicle will still be very minimal.

2. It could implement a new bike shuttle program. Several power units could be equipped with bicycle trailers (as noted in the previous section) and then these buses could be used to provide a dedicated “bike shuttle service” up the canyon every 30 or 60 minutes during the peak periods. It might be possible to do this without increasing operating costs, if the load patterns make it clear that certain trips with bus/trailer units can be replaced with bus/bike shuttle units. This is still to be determined.

Both of these options deserve further study and evaluation.

References:

For further research on bicycle and transit integration, the Transportation Research Board has published a synthesis of design examples and effective policies in TCRP 62: Integration of Bicycles and Transit, that can be found here:
http://onlinepubs.trb.org/Onlinepubs/tcrp/tcrp_syn_62.pdf

Burtech website: http://www.burtechtrailers.co.uk/product.asp?pid=8

Pendle website: http://www.kudubikes.co.uk/shop/400/