



Planning and Development Department

Land Use Planning Division

MEMORANDUM

DATE: June 11, 2008

TO: Members of the Planning Commission and Transportation Commission

FROM: Kara Vuicich
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SUBJECT: Berkeley Bus Rapid Transit and its alternatives

Recommendation

Staff recommends that the Planning and Transportation Commissions review and discuss the following:

- Common terms and definitions to enable effective communication,
- Basic elements (such as stations, dedicated lanes, etc.) of the transit options available: Local Bus, Rapid Bus Plus, and Bus Rapid Transit (BRT),
- A methodology for evaluating potential local effects of the various alternatives, and
- A four-meeting collaborative process recommended by Planning and Transportation staff leading to a BRT recommendation for Berkeley;

Background

On October 23, 2007, the City Council directed the Planning Commission, in collaboration with the Transportation Commission and staff, to develop a City preferred alternative for the Bus Rapid Transit (BRT) system under consideration by AC Transit.

In addition to the BRT considerations, the Council also recommended that City staff and both commissions consider a separate proposal to AC Transit that would include:

- A study of the feasibility of and funding options for a corridor-wide EcoPass program, including all communities along the BRT route; and
- A formal request to fund and prioritize AC Transit's study of a future extension of Rapid Bus/BRT that would link the proposed Ferry Terminal and the Amtrak Station to the Downtown.

In response to the Council's October 2007 resolution, on April 9, 2008, the Planning and Transportation Commissions held a public scoping session on BRT, and received

numerous comments representing a wide range of public concerns and positions on the proposed BRT. Many of the comments expressed either “yes” or “no” position on BRT. However, a group of Berkeley residents (who refer to themselves as *Berkeleyans for Better Transportation Options, or BBTOP*) requested that the City and AC Transit also consider a “Rapid Bus Plus” option. Since that meeting the Transportation Planning staff has had constructive meetings with BBTOP to better understand their concerns and proposal.

Options for Commissions’ Evaluation

1. In an effort to facilitate a focused discussion of the broad range of public concerns and suggestions, Transportation and Planning staff propose a series of joint meetings. At these meetings, we will suggest common terms and methods for assessing the differences between the various transit options, including the “no-build” alternative and the Enhanced Bus/Rapid Bus Plus alternative. Through these discussions we will be able to develop options and compare them to the existing AC Transit-proposed alternatives.

These joint commission meetings will allow Transportation Planning staff to present the same information to both Commissions simultaneously, to respond to questions from both Commissions simultaneously, and to facilitate a broader understanding of the strengths and limitations of the available options. The City Council will then have access to more manageable information, well-vetted through a public process that reflects both Land Use and Transportation Planning issues.

As part of this process, Staff also will prepare a separate formal request (for consideration by the Commissioners and Council) to AC Transit, as requested by the City Council, (1) to study the feasibility of a corridor-wide EcoPass program and (2) to fund and study a future extension of Rapid Bus/BRT to link the proposed Ferry Terminal and the Amtrak Station to the Downtown. However, the initial focus will be on developing an understanding of BRT for Berkeley and comparing the different transit options.

Proposed Collaborative Process

To accomplish the goal of providing the City Council with alternatives BRT for Berkeley, the Transportation and Planning staffs propose a series of joint commission meetings designed to generate a focused analysis of the City’s options. Following is a brief outline of this process:

- June 11, 2008: Review and discuss the proposed collaborative process, common terms and definitions, transit elements of the various options, and a suggested methodology for evaluating potential local effects of the various alternatives.
- July 9, 2008: Present the alternatives in detail, including graphic illustrations, using the common terms and definitions discussed at the June meeting, and review the methodology for evaluating the effects of the different options.

- September 2008: Review and discuss the potential localized impacts and effects of these alternatives, using the methodology discussed at the July Meeting, in order to understand the pros and cons of the available options.
- October 2008: Review and discuss a summary of these alternatives as defined and discussed in the September meeting, leading to a recommended “BRT for Berkeley” option for consideration by Council.

Conclusion

Staff requests that commissioners review and discuss the following:

- The collaborative process, discussed above, to facilitate Council’s decision on BRT, and
- The common terms and definitions (Attachments 1 and 2) that will enable more effective communication between the two Commissions on these technical issues; and
- A methodology for evaluating potential local impacts of the various alternatives. (Attachment 3).

Next Steps

After the June 11th meeting, staff will revise the draft assessment methodology to reflect comments received. At the July meeting, Staff will present the BRT alignment options and other transit alternatives in more detail.

Attachments:

1. Common Terms & Definitions
2. Basic elements of Local Bus, Rapid Bus, and Bus Rapid Transit (BRT)
3. Methodology for evaluating potential local impacts of the various alternatives.

Key Terms for Bus Facilities and Operations

Alighting	The process of passengers exiting the vehicle.
Boarding	The process of passengers entering the vehicle.
Bus bunching	A situation that occurs when passenger demand is high and dwell times at stops are longer than scheduled. Headways become shorter than scheduled, and platoons of buses (several buses operating together as a convoy) develop, with longer intervals between platoons. The same effect can also be caused by lack of protection from general road traffic congestion or by traffic signal timing. Bunching can become cumulative and can result in delay to passengers and unused capacity.
Bus stop spacing	The spacing between stops affects passenger travel times and the number of locations served along the route. Stops for local bus routes are typically two to three blocks apart (1,000 ft. or 0.2 mile). Stops are spaced close enough together so that passengers can walk to them easily, but far enough apart to help buses move quickly. Rapid bus stops (AC Transit Routes 1R and 72R) are spaced approximately 0.5 mile apart.
Combined BRT and local service	As defined in East Bay Bus Rapid Transit Project DEIS/R, all bus service along the project alignment would be operated along the BRT transitway as express service. [In contrast, the current 1R Rapid service also has a local route, the 1, that operates concurrently along the same route.] The only routes that would use mixed-flow lanes would be those that operate along short segments of the alignment before continuing onto other streets. Peak period BRT headways would be 3.6 minutes. Stations would be spaced 0.25 to 0.35 miles apart to be better suited to local trips.
Dedicated lane	A traffic lane established for and restricted to specific types of vehicles. It can be placed in different positions relative to the street (i.e., next to the curb, within the center median of a two-way street, etc.). As defined in the East Bay Bus Rapid Transit Project DEIS/R, the BRT transitway would typically consist of dedicated lanes for transit only. Other traffic with the exception of emergency vehicles would be prohibited from using the transit way. Transitways would be separated from mixed-flow traffic lanes by a mountable curb.
Dwell time	The time associated with a vehicle being stopped at a curb or station for the boarding and alighting of passengers, measured as the interval between its stopping and starting.

Headway	Also referred to as service frequency, this is the time interval between the passing of the front ends of successive transit buses moving along the same route in the same direction, usually expressed in minutes. Shorter headways (i.e., five or ten minutes between buses) provide more frequent bus service to transit passengers.
Lane widths	Travel lanes are between 10-12 feet wide, bike lanes are between five and seven feet wide, and parking lanes are generally between seven and eight feet wide.
Level of Service (LOS)	Level of service is a qualitative description of transportation service from the user perspective. LOS "A" represents excellent conditions from the user perspective and LOS "F" represents congested or unpleasant conditions.
Median-running BRT	A dedicated transit lane for BRT that is located in the center of a two-way street.
Mixed-flow lane	A traffic lane shared by all vehicle traffic (buses, automobiles, delivery trucks, etc.).
Near-side/far-side stops	Near-side stops are located immediately before an intersection. While they allow a bus to serve passengers while stopped at a red light at signalized intersections, they can result in additional delay. Far-side stops are located immediately after an intersection and require a bus to pass through the intersection before stopping to serve passengers. For intersections at which a bus has transit signal priority, far-side stops are necessary.
One-way couplet	A pair of one way streets that complement each other in direction (e.g. north/south). For example, Bancroft and Durant between Shattuck and Piedmont is a one-way couplet.
Operating speed	The highest safe speed at which a bus is normally operated on a given roadway under prevailing traffic and environmental conditions; the speed between points, not including stopped time.
Origin-destination (O-D) study	A study of the origins and destinations of the trips of vehicles or travelers. It may also include trip purposes and frequencies.
Person throughput	Measuring the number of people (as opposed to the number of vehicles) that can travel through a particular area during a given time period.

Proof of payment (POP)	An open fare collection system that has no turnstiles or fare gates. It requires that the passenger display proof of payment (e.g., validated ticket, prepaid pass, valid transfer) while on board the bus. Enforced through random checking by specific transit employees, security staff or police with the power to collect premium “on-board” fares or issue tickets or citations, typically resulting in revenue loss below 2-3%. Widely used in Europe and on North American light rail systems, the system combines flexibility and low cost with the fewest impediments to passengers with disabilities. Often combined with “self service” ticket vending machines.
Real-time transit information	Information pertaining to schedules, wait times, and delays to passengers at stations or on-board vehicles using real-time message signs and automated vehicle location technology (AVL). Some systems also allow passengers to access real-time information via cell phones and other wireless devices.
Separate BRT and local service	As defined in East Bay Bus Rapid Transit Project DEIS/R, two services would operate along the transit alignment. BRT buses would operate along the BRT transitway; regular bus services would operate in adjacent mixed-flow lanes as supplemental service. BRT peak period headways would be five minutes and stations would be spaced between 0.54 to 0.5 miles apart. Local bus peak period headways would be 12 to 15 minutes and stops would be located at the curb, every two to three blocks.
Side-running BRT	BRT priority lane is located adjacent to the curb (prohibits all curbside parking).
Transit Signal Priority (TSP)	Changes to normal traffic signal cycles to ensure that buses are given signal priority over general vehicular traffic. The green phase of a traffic signal is extended for approaching buses in order to minimize stopped delay at intersections.
Station	Can range from enhanced stops to transit centers that connect to other modes. A station differs from a stop in that it has more passenger amenities such as benches, shelters, traveler information, and ticket or farecard sales.
Stop	These are typically curb side bus stops with a bus route sign and limited amenities for transit patrons such as a bench or shelter and route map and schedule.
Ticket vending machines (TVM)	A fixed machine that accepts cash and credit cards to dispense proof-of-payment fare media.

**Transit Village
Development
Planning Act of
1994 (G.C. Sec.
65460)**

Government Code Section 65460 allows cities and counties to develop and adopt transit village plans for the area within ¼ mile of a “transit station” that link mixed-use developments to transit systems. Transit village plans must be prepared, adopted and amended in the same manner as a general plan and must be consistent with the general plan.

G.C. Sec. 65460.1(b)(4) defines “Transit station” as “a rail or light-rail station, ferry terminal, bus hub [an intersection of three or more bus routes, with a minimum route headway of 10 minutes during peak hours], or bus transfer station.”

Reference: *Transit Capacity and Quality of Service Manual, 2nd Edition*
(http://www.trb.org/news/blurbs_detail.asp?id=2326)

Basic Elements of Local Bus, Rapid Bus/Rapid Plus, and Bus Rapid Transit (BRT)

ELEMENT	CRITERIA	Local Bus	Rapid Bus or (Rapid Plus)	Bus Rapid Transit
Stations	Curb stop	X	X	
	Stations spaced at ¼ mile or less	X		
	Stations spaced 1/3 to ½ mile apart		X	X
	Dedicated station platform along curb (in select locations)			X
	Dedicated station platform in median			X
	Station platform height/length allows for level access and multiple-door entry/exit			X
Service & Operating Plan	Average headway 15 to 20 minutes during peak times	X		
	Average headway 10 minutes during peak times		X	
	Average headway 5 minutes or less during peak times			X
	Route makes direction changes, bends, and loops	X		
	Straight-line route with few bends or direction changes		X	X
Intelligent Transportation Systems (ITS)	Limited or no Transit Signal Priority	X		
	Transit Signal Priority		X	X
	Coordinated traffic signal for transit service (requires dedicated lanes)			X
	Select stations or stops have real time passenger information	X		
	All stations or stops have real time passenger information		X	X
Branding Identification	Conventional vehicles	X		
	Vehicles have special color / appearance		X	X
	Stations have special color / appearance, specially signed, illuminated, with amenities			X
Running Ways	Mixed flow lanes and conventional intersections	X	X	
	Dedicated lanes along curb side (in select locations)			X
	Dedicated lanes in median			X
	Distinctive or specialized pavement			X
	Lane-assist and precision-docking guidance technology			X
Vehicles	Conventional buses	X		
	Stylized upgraded buses		X	X
	Level boarding			X
	Multiple-door boarding and alighting		(X)	
Fare Collection	Pay on-board or show pass/transfer to the operator	X	X	
	Pre-board fare collection, proof-of-payment, display on demand of inspector		(X)	X

Draft Criteria for Assessing Bus Rapid Transit (BRT) Alternatives

Automobiles

- Turning movements & restrictions
- Intersection level of service
- Travel time and delay
- Parking – On-Street & UC Parking
- Diversion to parallel arterials

Pedestrians

- Street crossing distance
- Exposure to automobiles
- Pedestrian / auto driver visibility and awareness
- Public Safety for Pedestrians
- Streetscape

Bicycles

- Impact on existing bicycle lanes
- Bicycle / auto driver visibility and awareness
- Conflicts with vehicles (including buses)

Transit Access

- Pedestrians
- Bicycles
- Persons with disabilities
- Distance to stops

Transit Ridership and Operations

- Transit connections
- Ridership
- Major trip generators (origins & destinations)
- Reliability
- Frequency
- Operations
- Layover

Economic & Development Impacts

- Land Use
- Customer Access
- Construction Impacts
- Paving Maintenance

Neighborhoods

- Automobile cut-through traffic
- Parking intrusion

Street Operations

- Loading zones
- Traffic enforcement

Emergency Services

- Hospital access
- Response

Environment

- Greenhouse gas emissions
- Air pollutants