

# Developing a Regional BRT Network

Elizabeth Deakin  
University of California, Berkeley

for the  
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CATCHING THE NEXT RIDE:  
THE POTENTIAL FOR REGIONAL  
BUS RAPID TRANSIT SYSTEMS

New York University  
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## BRT is a lot of different things....



## ...and gets implemented for a lot of different reasons:

- Cut costs / increase productivity
- Increase services at modest cost
- Offer attractive service
- Bypass congestion in built-up urban corridors
- Lure travelers from car to bus
- Support economic development and revitalization
- Beautify the city / make it fun
- Structure urban growth
- Extend the reach of rail service
- Grow transit ridership for eventual light rail implementation

# Los Angeles MetroBus

Provides effective service  
across a vast region

Serves multiple  
employment centers

Links to nascent rail system

Addresses environmental  
justice concerns raised by  
bus cutbacks, rail  
investment





## San Francisco Muni BRT

Supplement rail , deliver  
services fast: keep  
promises to voters

Rail-ready corridors

**Complete streets –  
current issue is how to fit  
bike lanes in**





# AC Transit

(SF Bay Area: Oakland, Inner Suburbs, Transbay)

Express Bus, Rapid, BRT

Transbay to SF

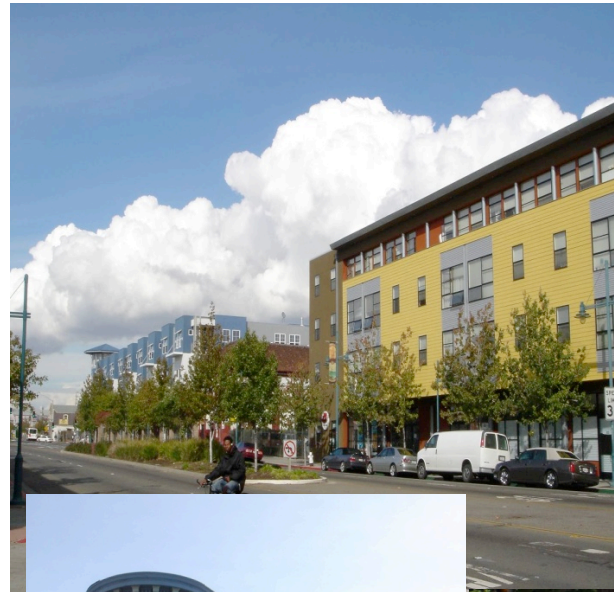
East Bay Rapids

Now: BRT Berkeley – Oakland – San Leandro

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AC objectives:  
Lower operating costs  
Balance loads

Cities' objectives:  
Infill projects – jobs, housing, tax base  
Street redesigns



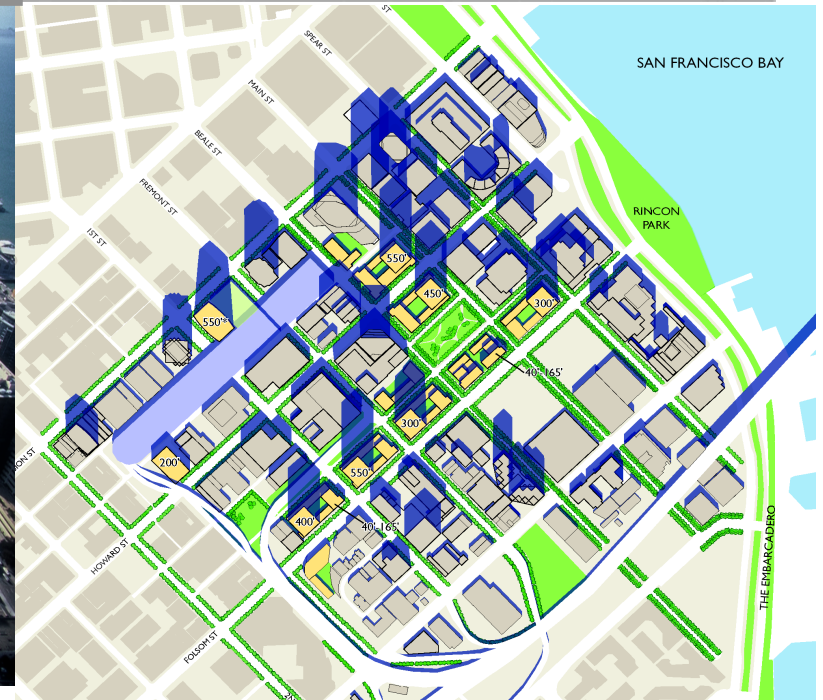
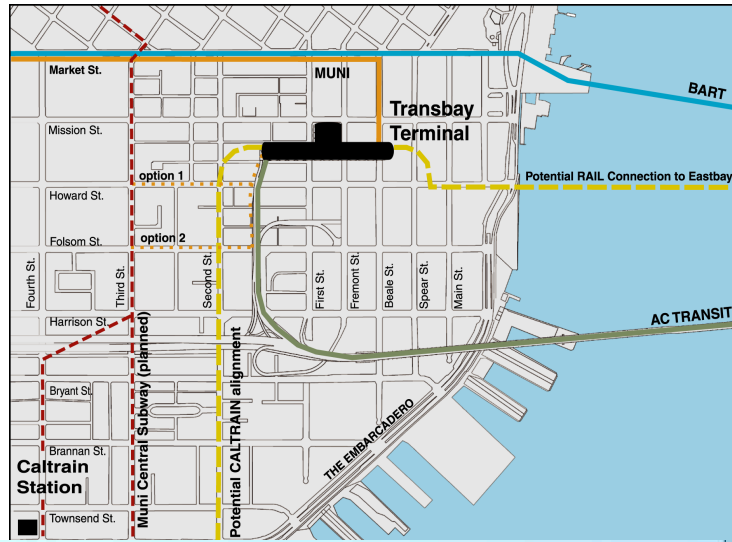
TELEGRAPH AVENUE AT 31ST STREET - PROPOSED

PILL HILL STATION



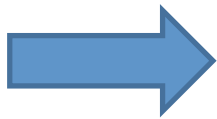
# San Francisco Transbay Terminal

Link AC, MUNI,  
other operators



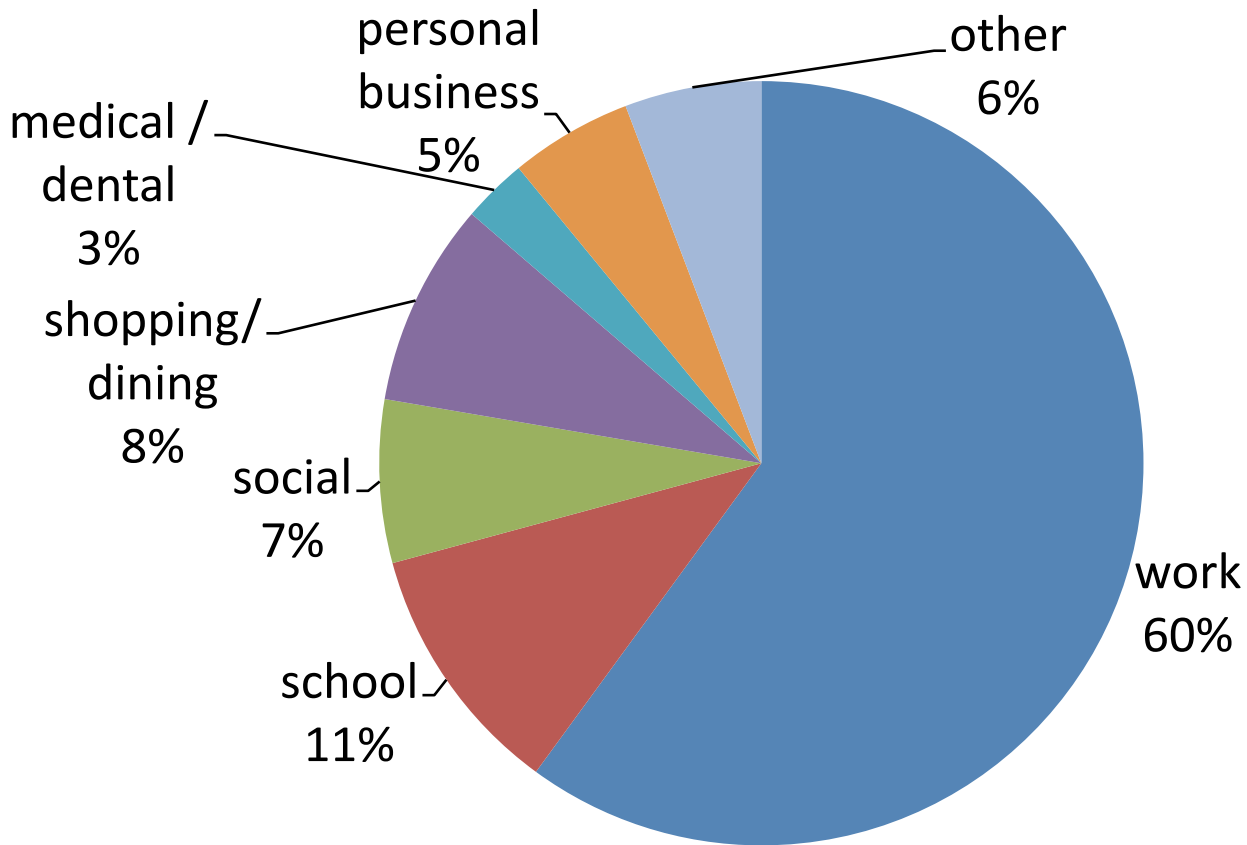
:So if BRT comes in all flavors, and you pick one to suit:  
**why take a regional approach?**

- Because lots of travelers (40%, nationally) transfer between lines and services, and probably more would .... BUT....
- Access time (walk, wait, transfer) is 2-3 times as onerous as time in-vehicle - so if these are bad, transit loses
- Cities have to be partners in most BRT plans - many BRT elements aren't within the transit agency's purview
- Businesses and residents get concerned about losing lanes, parking-need to look at systemwide effects to manage
- Good planning can avoid, minimize, mitigate, compensate
- Other benefits, like better balanced growth resulting in more balanced demand for transit, come from a regional approach



**BRT reaches more markets and works better when implemented as part of a larger regional strategy for transit**

# Typical Transit Trip Purposes





# Model Coefficients

Attribute /Units	home based work	home based other	non-home based
In-vehicle time for (most) transit modes / Minutes	-0.02	-0.01	-0.02
In-vehicle time for commuter rail / Minutes	-0.016	-0.008	-0.016
All out-of-vehicle time / Minutes	-0.04	-0.02	-0.04
Drive-access time / Minutes	-0.04	-0.02	-0.04
Transfers / Number	-0.1	-0.05	-0.1
Fares / Cents	-0.003	-0.0015	-0.0015

# Walk Time vs In -Vehicle Speed

Walk speed (mph)	2	3	4		
Feet per min	176	264	352		
Time to walk extra 1/4 mi	7.5	5	3.75		
Equiv. in-veh time if walk~ twice as onerous	<b>15</b>	<b>10</b>	<b>7.5</b>		
distance on bus (mi)	3	6	9	12	15
on board travel time at 15 mph	12	24	36	48	60
on board time at 20 mph	9	18	27	36	45
<b>time savings</b>	3	6	<b>9</b>	<b>12</b>	<b>15</b>
on board time at 25 mph	7.2	14.4	21.6	28.8	36
<b>time savings</b>	4.8	9.6	14.4	19.2	24



# Minimize waits and transfers:

- Frequent service
- Coordinated schedules
- Seamless transfers: cross platform transfers, end to end platforms, multilevel designs with easy connections.
- Transfers indoors or under shelter
- Vendors, restrooms, public art at major transfer points ( part of system, or available in station area)

# Mitigate BRT's greater walk time:

- Locate stops at points along the system with highest demand, rather strict distance-based spacing
- Improve pedestrian access – crossings, sidewalks, lighting, landscaping, street furnishings, public art – make access time less onerous.
- Complementary urban development: produce riders as well as a good urban environment, make transit a catalyst for better cities and towns



# Getting started at a regional approach: match service to patterns of demand

- Go for higher transit mode share as well as higher ridership totals
- Examine OD pairs – where is transit used, where is it not, & why not?
- Plan to serve high OD pairs - fill in gaps, extend rail services
- Look for investments in transit that can support economic development and improve the environment

Then:

- Coordinate schedules and operations to make transfers fast and seamless
- Create incentives for transit-friendly development

# Encouraging transit-oriented urban development along a BRT corridor: what cities can do

- Zone for minimum as well as maximum densities, to prevent inappropriate low density uses from occupying prime sites
- Encourage mixed use development
- Form-based codes to control design details such as height, setback, landscaping, parking location, and window and door treatments
- Inclusionary zoning - encourage affordable housing as well as market-rate developments
- incentive zoning - higher densities, reduced parking requirements in return for desired project features
- reduce parking requirements to reflect transit use
- allow shared parking, stacked parking (reduce impact, cost of development)
- Carsharing or rental car options for occasional auto use
- Disallow / restrict auto-dependent uses and uses that generate few passenger trips, such as storage facilities.



# Partnerships needed

- Among transit operators
- With state DOTs for freeways, some arterials
- With cities for city street designs, traffic operations, pedestrian and bike elements, urban plans
- With state DOT and MPO for analysis, funding
- With development community, property owners, businesses and residents: allay concerns, build support

And then:

BRT requires ONGOING management and operations –  
BRT challenge and opportunity for continual  
improvement

## To summarize:

- **BRT is likely to have far more effectiveness if it is implemented as part of a larger regional strategy for transit.**
- BRT plans need to pay attention to access time and transfers
- Urban development and access plans can be excellent complements to BRT plans.