CITY OF OAKLAND

AGENDA REPORT

TO: HENRY L. GARDNER
INTERIM CITY ADMINISTRATOR

FROM: Rachel Flynn

SUBJECT: Consideration of the Draft Emeryville-Berkeley-Oakland Transit Study (EBOTS)

DATE: October 17, 2014

City Administrator Approval

Date 10-5-14

COUNCIL DISTRICT #3

RECOMMENDATION

Staff recommends that the City Council receive a report and provide possible direction to staff to endorse and/or provide comments to the City of Emeryville, as the Lead Agency, in Response to the Draft Emeryville-Berkeley-Oakland Transit Study (EBOTS).

EXECUTIVE SUMMARY

The purpose of the EBOTS is to improve transit access in Emeryville, West Oakland and West Berkeley, including connectivity within the study area and "last mile" connections to regional transit and destinations. The interagency effort is being spearheaded by the City of Emeryville, working with the cities of Berkeley and Oakland, AC Transit, BART, Alameda County Transportation Commission, Emeryville Transportation Management Association and other transit-related entities. A Draft Emeryville Berkeley Oakland Transit Study Report ("Report") (see ***Attachment A***) has been prepared which identifies near- and long-term recommendations that highlight development of a 'Trunkline Connector Route' (a service proposed to be operated using a branded hybrid bus), and in the longer-term, promotion of two streetcar lines – one in Emeryville and another in West Oakland that would connect West Oakland along Mandela Parkway at the West Oakland BART Station to major transit terminals and economic development areas.

The Draft EBOTS report is being concurrently reviewed by a number of governmental agencies for comments and/or an endorsement during the months of October and November, with a Final EBOTS report expected to be submitted to the Emeryville City Planning Commission in December and Emeryville City Council in January for approval. The item is submitted for consideration in order to allow the Oakland City Council to submit comments as applicable, before the Report is finalized for City of Emeryville approval.

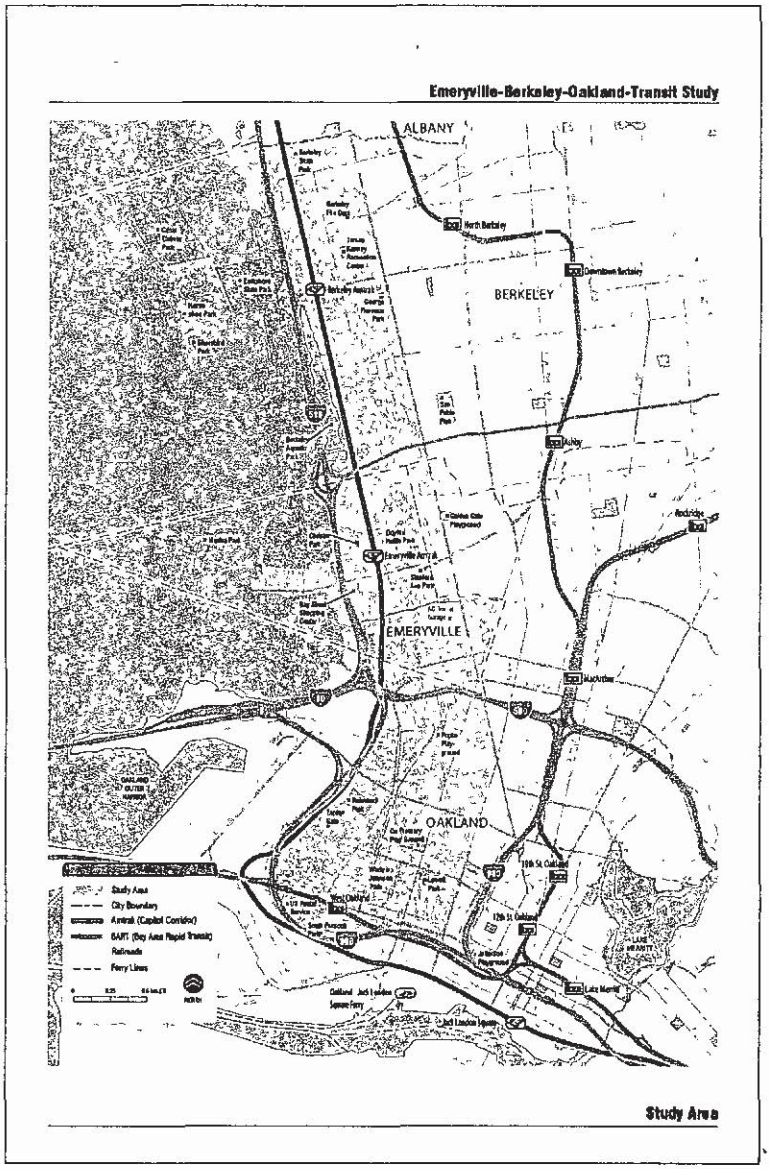
Item: _____
City Council
November 18, 2014

OUTCOME

The outcome of this consideration is the incorporation of comments that reflect Oakland's transit preferences and/or comments on a document that would be considered for approval by a neighboring jurisdiction.

BACKGROUND/LEGISLATIVE HISTORY

Emeryville received a Federal Transit Administration grant through Caltrans in February 2013 for an Emeryville-Berkeley-Oakland Transit Study. The Study has identified and evaluated transit options in the areas within the three cities which are west of San Pablo Avenue and Market Street; the study area is bounded on the south and west by I-880, I-80 and the Bay, and on the east and north by Market Street, San Pablo Avenue, Adeline Street, Temescal Creek, San Pablo Avenue, and Berkeley's northern border as shown in the shaded area below:



The EBOTS project goals are to:

- Create an environment where a car is not required for mobility
- Use transit to create a well-connected and cohesive corridor with good access to jobs, education and recreation
- Coordinate transit improvements with future population and job growth to help spur economic development
- Make near-term transportation improvements including bus route modifications, new shuttle operations, and transit reliability and frequency increases, and
- Enhance long-term mobility within the corridor, possibly including new transit service such as a streetcar or bus rapid transit

On May 21, 2013, the Emeryville City Council approved a contract with CDM Smith to conduct the EBOTS effort. Shortly thereafter, an EBOTS Technical Advisory Committee was comprised of representatives of the various participating agencies; additionally a Policy Advisory Committee comprised of representative from each city's Mayor, a resident from each city, transit board members, and representatives from the three cities' Chambers of Commerce, the West Oakland Commerce Association, the Center for Independent Living, and the East Bay Housing Organizations, was formed.

After reviewing many existing plans and studies and analyzing opportunities and constraints, the consultant-staff team conducted two rounds of Community Workshops and a questionnaire, and pursued other actions as noted below:

- November 2013 - January 2014: Identify Trip Patterns, Problems, Ideas
  - EBOTS Policy Advisory Committee
  - Three community workshops and questionnaire
  - Emeryville Transportation Management Association

- April - June 2014: Develop and Review Options
  - EBOTS Policy Advisory Committee
  - Three community workshops and questionnaire
  - Emeryville Transportation Management Association
  - AC Transit Board
  - Berkeley Transportation Commission

- July - September 2014: Draft and Receive Comments on Preliminary Recommendations
  - Oakland Community and Economic Development Council Committee
  - West Oakland Business Alert and West Oakland Neighbors
  - Emeryville Economic Development Committee
  - EBOTS Policy Advisory Commntee
  - EBOTS Technical Advisory Committee
  - Berkeley Transportation Commission

- Emeryville Transportation Committee

Preliminary recommendations were developed based upon feedback from these forums and input from the EBOTS Technical Advisory Committee and Policy Advisory Committee.

The preliminary recommendations were discussed at the July 22, 2014 meeting of the Oakland City Council's Community and Economic Development Committee as an informational report; due to the preliminary nature of the proposals the item was not presented to the City Council at that time.

ANALYSIS

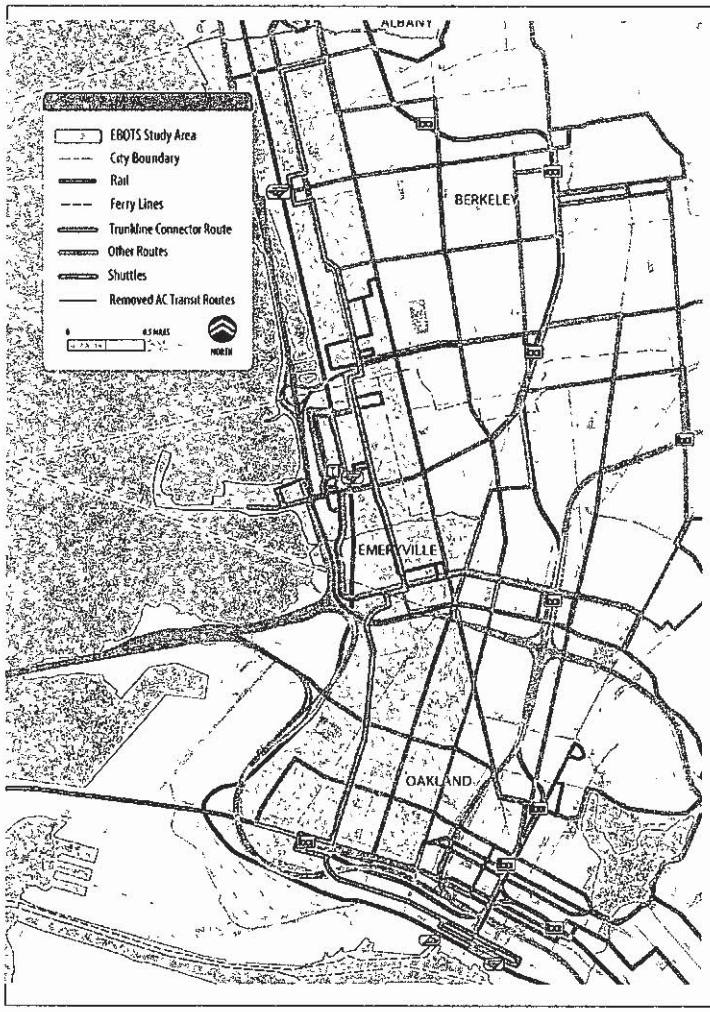
The EBOTS Report contains a set of draft conceptual recommendations, including short-term transit improvements, a Trunkline Connector, and Streetcars.

Short-Term Improvements:

Short-term improvements would include working with major developers to establish a West Oakland shuttle from the West Oakland BART Station to West Grand Avenue - connecting to the proposed Gateway Park and to the forthcoming Oakland Global Logistics Center development at the former Army Base; improving two Emeryville bus stops, connecting to Berkeley Amtrak, improving AC Transit service between central Emeryville and downtown Berkeley, encouraging use of AC Transit Easy Passes, and studying demand-response transit for late night coverage *[See page 15 of EBOTS Report for more details]*.

EBOTS Trunkline Connector Route:

The Trunkline Connector would be a branded hybrid bus with level boarding, operating at 10-minute frequency, between 6am to 10pm weekdays and 7am to 11pm weekends, with signal priority for faster travel, shelters with cameras and bike racks, real-time arrival information, and marketing. It would provide hi-directional service from Jack London Square to the West Oakland BART Station, and north through Emeryville and West Berkeley, traveling on 3rd Street, Mandela Parkway, and Hollis, 7th, 6th, and Gilman Streets. The EBOTS Report mentions options for the north end including service to Downtown Berkeley [*See page 17 and the following Figure 4 of EBOTS Report for more details]*.



EBOTS Trunkline Connector Bus

- From Jack London Square to West Oakland BART via 3rd Street, then to Emeryville and West Berkeley via Mandela Parkway, Hollis, 7th, 6th and Gilman Streets.

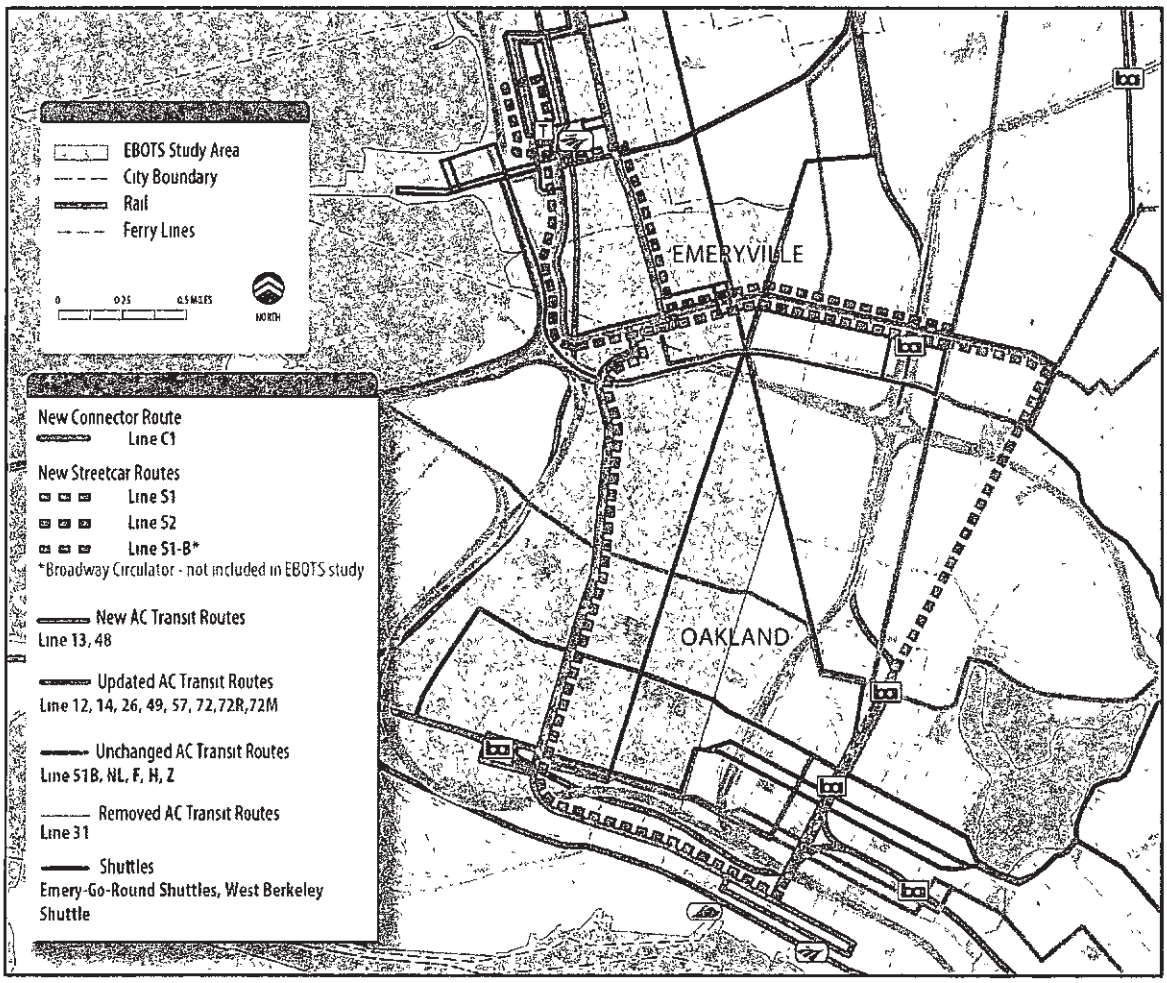
- Branded hybrid or battery bus
  - 10-minute frequency, 15 minutes in early and late hours
  - 6am to 10pm weekdays, 7am to 11pm weekends
  - Faster travel – signal priority, only 5 stops per mile
  - Level boarding
  - Shelters with lighting, cameras, benches, trash bins, bike racks
  - Real-time arrival info
  - marketing

EBOTS Streetcar Routes:

The proposed West Oakland Streetcar would connect MacArthur BART, East Baybridge shopping area on the Oakland-Emeryville Border, West Oakland BART, and Jack London Square. It would travel on 40th Street, Mandela Parkway and 3rd Street. It would connect two ends of the Broadway transit service, forming the "O" envisioned in the West Oakland Specific Plan. If the Broadway service does not extend on 40th to MacArthur BART, the EBOTS service would need to extend on 40th Street to Broadway to complete the "O."

The proposed Emeryville Streetcar service would connect Emeryville to MacArthur BART by running in two directions on 40th, Shellmound, 64th, Christie, Powell, Hollis and back on 40th Streets. This route would supplement the Emery Go-Round by adding service where ridership is highest *[See page 19 and the following Figure 5 of EBOTS Report for more details].*

EBOTS Proposed Street Car Routes



The EBOTS Report analyzes ridership, reduction in vehicle miles traveled, effects on environmental justice communities, safety and security, costs, compatibility with existing transit, and economic development impact. Highlights include the following:

Ridership: The Report estimates that the Trunkline Connector would add about 3,800 to 5,300 new riders, the West Oakland Streetcar would add about 3,100 to 4,200 new riders, and the Emeryville Streetcar would add about 4,900 to 6,300 new riders.

Reduction in Vehicle Miles Traveled (VMT): The Trunkline Connector would reduce VMT by about 4,700 to 6,200 miles; the West Oakland Streetcar would reduce VMT by about

5,300 to 6,500 miles; and the Emeryville Streetcar would reduce VMT by about 8,300 to 10,200 miles.

Effects on Environmental Justice Communities: The routes would serve about 72% minority and 43% low-income communities, compared to area population percentages of 73% minority and 44% low-income. The slight difference reflects the fact that the study area is wider in the southern part of West Oakland, so a line cannot be within a quarter-mile of all residents there. Benefits could include improved access to appropriate education and employment opportunities and attraction of retail and services that would reduce sales leakage out of the area.

Safety and Security: The EBOTS Report points out factors to bear in mind when transit stops are designed, including visibility and effects of bulb-outs on bike lanes. Street design will need to minimize risks associated with tracks, such as bicycle wheels getting stuck in tracks and streetcars not being able to change lanes. Security measures will include lights and cameras at the bus shelters.

Costs: The annualized cost of the recommendations is estimated as follows:

- Trunkline Connector (8.1 miles, 12 years): $19-21 million/year
- Emeryville Streetcar (5.3 miles, 30 years): $13-15 million/year
- West Oakland Streetcar (4.3 miles, 30 years): $9-11 million/year

Compatibility with Existing Transit: The Trunkline Connector would overlap the part of AC Transit's potential rerouted Line 26 that would run on Mandela Parkway, and would overlap Emery Go-Round service on part of Hollis Street. The Oakland Streetcar would overlap the Mandela Parkway and 3rd Street parts of the Trunkline Connector, and part of AC Transit's potential rerouted Line 26 on Mandela Parkway. The Emeryville Streetcar would overlap the part of the Emery Go-Round routes that connect to BART on 40th Street, and would overlap AC Transit's potential Line 57 extension on 40th and Shellmound Streets.

Economic Development Potential: The Trunkline Connector would enhance access to development opportunity sites, promote trips within the study area, and expand access to and quality of transit in West Oakland. The Streetcars would connect West Oakland to Jack London Square and MacArthur BART, and would connect Shellmound to MacArthur BART. Phasing could be done by routes with value capture by each city. The West Oakland Streetcar would complete the "O" transit proposal envisioned by Oakland in its recently adopted West Oakland Specific Plan. The Emeryville Streetcar could handle increasing ridership in parts of Emery Go-Round routes with heaviest demand.

Funding and Implementation: Funding can come from local, regional, state and federal sources. Local sources include tax measures, public/private partnerships, privately sponsored systems, and fare box revenue. Regional sources include grants administered by the Metropolitan Transportation Commission and Bay Area Air Quality Management District State sources include the

Transportation Development Act, the Public Transportation Account, and the Modernization, Improvement and Service Enhancement Program Federal Transit Administration programs include New Starts, Very Small Starts, Small Starts, and TIGER (Transportation Investment Generating Economic Recovery) grants.

In addition to listing potential funding mechanisms, the EBOTS Report also identifies the types of agencies which can receive Federal formula funds and potential operators for the Trunkline Connector and Streetcars. The Trunkline Connector could be operated by a transportation management association or AC Transit. The streetcars could be operated by a transportation management association, AC Transit, BART, or a tri-city joint powers authority. The Report also lists fund readiness strategies that could be used if non-traditional transit funding is to be sought.

PUBLIC OUTREACH / INTEREST

A Technical Advisory Committee was convened including staff members from the three cities, five transit agencies (Emeryville Transportation Management Association which runs the Emery Go-Round, Berkeley Gateway Transportation Management Association, AC Transit, Amtrak Capitol Corridor, and BART), Alameda County Transportation Commission, and the Metropolitan Transportation Commission. The Technical Advisory Committee has met on the following dates: March 6, 2013; June 26, 2013; September 4, 2013; October 2, 2013; February 5, 2014; April 2, 2014; July 18 2013; and September 17, 2014A Policy Advisory Committee was formed, composed of a representative from each city's Mayor, a resident from each city, transit board members, and representatives from the three cities' Chambers of Commerce, the West Oakland Commerce Association, the Center for Independent Living, and the East Bay Housing Organizations. That committee met on October 28, 2013; April 28, 2014; and September 8, 2014 to discuss ideas for transit in the area.

EBOTS information and preliminary recommendations have been shared at various forums such as the West Oakland Business Alert, Oakland Broadway Transit Study staff, West Oakland Neighbors, Emeryville Economic Development Committee, EBOTS Technical Advisory Committee, EBOTS Policy Advisory Committee, Berkeley Transportation Commission, as well as by the Emeryville Planning Commission. A more detailed description of the public input process and a summary of comments as of July 2014 was presented in the July 22, 2014 Community and Economic Development staff report, included as ***Attachment B*** of this staff report. Additional information on the outreach process and comments received can be found on the project website http://www.emeryville.org/ebots.

The proposals were also presented to the Oakland Planning Commission on October 15, 2014. The Planning Commission was wholly supportive of the EBOTS effort. Among their comments (and staff's response where necessary):

Planning Commission Question or Comment	Response
○ Were the cost figures in the EBOTS Report included salary costs for operators of the streetcar?	The salary costs are included.
○ What are the advantages of the proposed streetcars vs. the proposed bus line (Trunkline) proposal?	The advantage of the streetcar is that in installing tracks in the street a city signals to the development community that this transit investment commitment is long-term and that the areas surrounding the streetcar is where more intensive development is expected to occur and will be supported. Bus lines, alternatively can be easily changed for various reasons sometimes not related to or in conjunction with a city's development plan.
○ What is the rationale behind pursuing both a Trunkline and streetcar proposals as opposed to one or the other?	The inclusion of both proposals is a function of what's feasible in the short-term vs. what could be done in the long-term. In the short-term it's relatively easier to get a bus started that would meet the immediate ridership projections. However, if the City's West Oakland Specific Plan area builds out as envisioned, and if Oakland and the area in general build out as the Association of Bay Area Governments projects, there may be a demand for both types of transit resources in the future.
○ Was there any consideration of extending the existing Emery Go Round shuttle into West Oakland?	Yes. The Emeryville Go Round is funded by businesses in Emeryville who formed an Assessment District. One of the ways for extending the Emery Go Round would be if the businesses in West Oakland and West Berkeley wanted to form an Assessment District. One idea broached by a West Oakland business group is that if someone could get it started with

Planning Commission Question or Comment	Response
	a grant, then the businesses along the route might want to continue it after the grant is over and participate in funding the service. If there was a means of paying for it we believe the people who run the Emeryville Go Round would be willing to extend the lines to service the West Oakland BART area.
o The EBOTS Report is marvelous. The two things together [the WOSP and EBOTS transit improvements] will generate demand for each other.	[No Response Required]
o Support expressed for both the Trunkline and the streetcars proposal. The streetcar will help create a sense of place along Mandela Parkway and enhance property values.	[No Response Required]
o Would like to see a dark fiber line incorporated with the transit infrastructure improvements. This may be outside of the EBOTS Report scope but it's good to take advantages of opportunities where possible.	[No Response Required]
o Expanded services hours would benefit West Oakland; having eyes on the street to help people get to and from work is beneficial. The hours could be 10:00 or 11:00 evenings on selected days. o This is really important especially for people whose work shifts are outside the traditional 9 to 5 hours.	[No Response Required]
o Great Plan and hopeful that it moves forward.	[No Response Required]
o Like the connection to Army Base development; it's an opportunity for people to get from the West Oakland BART	[No Response Required]

Planning Commission Question or Comment	Response
Station to the Army Base.	
o Nothing more exciting that different cities working together. Land use is regulated on a city-by city basis but the user experience is on a regional level so when you have many cities working together it's inspiring.	[No Response Required]
o Like in many cities, the neighborhoods are growing lopsided—many neighborhoods are robust and there are some that are not robust, and transit is one of the easiest ways to be the great equalizer for economic development.	[No Response Required]
o A preference for busses over streetcars was expressed on the part of one Commissioner because bus routes can change over time and streetcars cannot. As West Oakland is being developed the transportation patterns may change and busses can adapt while streetcars cannot.	[No Response Required]
o Agreement expressed for two EBOTS objectives in particular: - Create an environment where a car is not required for mobility - Coordinate transit improvements with future population and job growth to help spur economic development.	[No Response Required]
o Support expressed for creating an Assessment District if and when necessary to support the transit improvements.	[No Response Required]

The Planning Commission suggested the EBOTS Report be augmented as follows:

- Include 'transit justice' organizations such as ACCE (Alliance of Californians for Community Empowerment) and TransForm in the EBOTS review process if they have not already participated; and invite transit advocacy organizations to the November 8, 2014 EBOTS Community Meeting in West Oakland.

- Include data on transit-dependent elders and disabled parties in the EBOTS Report's Environmental Justice chapter.

- Include more info on ridership; include more economic analysis on who the riders would be. It is important to ensure the EBOTS Report can document the expected demand for its recommendations. Explore whether there's a way in the spirit of demand analysis, to purchase information that help justify bus routes, public investments, late night travel resources.

The EBOTS proposals are additionally scheduled to be presented for public input at the following events which includes a West Oakland community meeting on November 8, 2014:

Discussion of the Draft EBOTS Report:
- October 16 – Emeryville Transportation Management Association (Emery Go-Round)
- October 21 – Emeryville City Council
- October 28 – Berkeley City Council
- November 8 – West Oakland Community Meeting
- November 12 – AC Transit Board
- November 18 – Oakland City Council (Tentative)
- November 20 – BART Board

NEXT STEPS

Upon completion of public review of the Draft EBOTS Report in November 2014 a Final EBOTS Report is expected to be presented to the Emeryville City Planning Commission on December 11, 2014, and to the Emeryville City Council for approval on January 20, 2015.

COORDINATION

The EBOTS effort commenced shortly after the West Oakland Specific Plan (WOSP) was initiated. There was much coordination between the two efforts, with several Oakland staffers that worked on the WOSP project also participating on the EBOTS Technical Advisory Committee to ensure consistency in development expectations for West Oakland. The EBOTS Report acknowledges several key underlying tenets of the WOSP, among them:

- "...There is a need to better tie in MacArthur BART and Jack London Square to West Oakland and Emeryville commercial areas". *[page 19 of EBOTS Report].*

- "...The service investment and visibility [of streetcars] has shown to increase economic development and support walkable, transit-oriented development in cities that have recently implemented modern streetcar systems" *[page 20 of EBOTS Report].*

- "...Appropriately planned and operated local transit can enhance economic development..." *[page 37 of EBOTS Report].*

The EBOTS reflects the land use development patterns anticipated in the WOSP, and the EBOTS West Oakland Streetcar recommendation mirrors the alignment depicted as 'The O' in the WOSP. There was also communication between EBOTS representatives and City of Oakland Broadway Shuttle staffers; none of the EBOTS recommendations conflict, compete with or hamper current or anticipated future operations of the Broadway Shuttle.

This report has been reviewed by the Office of the City Attorney and by the Budget Office.

COST SUMMARY/IMPLICATIONS

There are no cost implications to the City of Oakland at this time. The EBOTS effort was funded by a grant received by the City of Emeryville; it was not necessary for the City of Oakland to participate in funding the project and Oakland has not contributed funding to the project. The EBOTS Report presents conceptual descriptions of particularly the streetcar proposals which would need to be examined in greater detail with more specific information generated and would additionally need to come back to the Oakland City Council for deliberation before they are implemented within Oakland city limits.

SUSTAINABLE OPPORTUNITIES

Economic: The EBOTS Report includes analysis of linkages to employment destinations and corridors within the subject planning area, thereby providing potential future benefit for access for West Oakland residents and employees.

Environmental: The EBOTS Report furthers the goals of improving transit access within West Oakland, and linkages to destinations in Emeryville and Berkeley.

Social Equity: The EBOTS Report considers the inequity of access to transit and transportation by low income residents of the EBOT Study area, including West Oakland, and proposes improvements to access to transit.

CEQA EVALUATION

The EBOTS effort is exempt from environmental review under Section 15262 of the State California Environmental Quality Act (CEQA) Guidelines, which applies to feasibility and planning studies. The draft recommendations are conceptual at this point. Much more detailed examination - particularly in regards to the proposed street car recommendations for West

Oakland - is required before the recommendations can be implemented. Once the recommendations have been generally endorsed, more specific information is will be generated and the appropriate level of environmental analysis pursuant to CEQA will be prepared. The recommendations will be brought back to the Council at that time with the relevant environmental evaluation, for consideration and implementation.

CONCLUSION

Staff recommends that the City Council receive a report and provide possible direction to staff to endorse and/or provide comments to the City of Emeryville, as the Lead Agency, in Response to the Draft Emeryville-Berkeley-Oakland Transit Study (EBOTS)

For questions regarding this report, please contact Elois A. Thornton, Department of Planning and Building, Bureau of Planning, 510-238-6284.

Respectfully submitted,

Rachel Flynn, Director
Planning & Building Department

Prepared by
Elois A. Thornton, Planner IV

Attachments:

Attachment A: Emeryville Oakland Berkeley Transit Study - Draft Report
Attachment B: July 22, 2014 Informational Report to the City Council Community and Economic Development Committee

Item: _____
City Council
November 18, 2014

ATTACHMENT A

CITY OF OAKLAND

FILED
OFFICE OF THE CITY CLERK
OAKLAND
2014 JUL 10 PM 12:41

AGENDA REPORT

TO: HENRY L. GARDNER
INTERIM CITY ADMINISTRATOR

FROM: Rachel Flynn

SUBJECT: Informational Report on Emeryville-Berkeley-Oakland Transit Study

DATE: June 24, 2014

City Administrator Approval

Date 7/8/14

COUNCIL DISTRICT #3

RECOMMENDATION

Staff recommends that the City Council receive:

An Informational Report on the Emeryville Berkeley Oakland Transit Study

EXECUTIVE SUMMARY

The purpose of the study is to improve transit access in Emeryville, West Oakland and West Berkeley, including connectivity within the study area and "last mile" connections to regional transit and destinations. The study is being managed by the City of Emeryville, working with the cities of Berkeley and Oakland, AC Transit, BART, Capitol Corridor, Emeryville Transportation Management Association and other transit-related entities. Issues being addressed in the study include potential AC Transit route extensions or modifications, connector routes linking to BART stations, mode for connectors (various bus service types or streetcar), features and funding.

OUTCOME

This is an information report on the Emeryville-Berkeley-Oakland Transit Study (EBOTS) scope and process to date.

Item: _____
CED Committee
July 22, 2014

BACKGROUND/LEGISLATIVE HISTORY

Emeryville received a Federal Transit Administration grant through Caltrans in February of last year for an Emeryville-Berkeley-Oakland Transit Study. The Study has identified and evaluated transit options in the areas within the three cities which are west of San Pablo Avenue and Market Street, as shown on the attached maps (***Attachment A*** and ***Attachment B***). A Technical Advisory Committee was convened including staff members from the three cities, five transit agencies (Emeryville Transportation Management Association which runs the Emery Go-Round, Berkeley Gateway Transportation Management Association, AC Transit, Amtrak Capitol Corridor, and BART), Alameda County Transportation Commission, and the Metropolitan Transportation Commission.

On May 21, 2013, the Emeryville City Council approved a contract with CDM Smith to conduct the study. After reviewing many existing plans and studies and analyzing opportunities and constraints, the consultant-staff team conducted three Community Workshops and a questionnaire. A Policy Advisory Committee was formed, composed of a representative from each city's Mayor, a resident from each city, transit board members, and representatives from the three cities' Chambers of Commerce, the West Oakland Commerce Association, the Center for Independent Living, and the East Bay Housing Organizations. That committee met on October 28, 2013 and April 28, 2014 to discuss ideas for transit in the area.

ANALYSIS

The following information on the vision, study area, existing and potential transit, and funding was presented at first round of meetings listed below under Public Outreach/Interest.

The vision of the Emeryville Berkeley Oakland Transportation study is to help create a place where a car is not required, with access to jobs, education and recreation; to provide transit for job growth; to make near-term improvements such as bus route changes, new shuttle operations and increased reliability and frequency; and to enhance long-term mobility, possibly with a streetcar or bus rapid transit. This study will be coordinated with other plans being conducted by Oakland (Broadway Urban Circulator Study and West Oakland Specific Plan), Berkeley (GoBerkeley Parking Plan) and AC Transit (Line 51 Improvement Study).

The three-city study area now has 33,000 residents, 24 schools and 40,800 jobs. It is projected to have 60,500 residents and 64,000 jobs by 2040. Currently, only 3% of the people who work in the area live in the area. Of area residents, 20% commute by transit. Land uses include 29% public agency lands, 18% major parks, 18% residential, 16% industrial-warehouse-wholesale uses, 11% commercial and office uses, and 8% other uses.

Existing transit includes 18 AC transit lines, the West Oakland and MacArthur BART stations, Amtrak Capitol Corridor trains, and shuttles from Emeryville to MacArthur and from West

Berkeley to Ashby BART stations. Area residents get to BART by walking (37%), car (32%), transit (19%), bicycle (11%) and taxi (1%).

Transit opportunities in the area include nearby regional transit, a jobs-rich environment, higher transit use by residents than other Bay Area residents, lower car ownership rates than the overall three-city area, and designation of Priority Development Areas (which are eligible for regional transit funding). Constraints include the need for funding; low population and housing density; freeway and railroad barriers; limited right-of-way on streets for transit; and peak hour congestion on San Pablo Avenue and three streets in Berkeley (University Avenue, Gilman Street and Ashby Avenue).

Potential near-term (0 to 3 years) improvements include bus route changes, new or expanded shuttles, improved frequency and hours of existing service, improved station amenities, and last mile solutions such as pedestrian and bicycle improvements and carpooling. Potential mid-term (3 to 10 years) improvements include new bus service, bus lanes, a transit center or hub, bicycle sharing, and street improvements such as bulb-outs, signal priority and real-time arrival signs. Potential long-term (10+ years) improvements include streetcar, automated guide way transit, light rail, full-scale bus rapid transit, grade separations, and Capitol Corridor improvements.

As transit technologies increase in capacity, speed and reliability, they increase in cost per mile and right-of-way requirements. By providing reliable, frequent service, major transit investments expand the commute-shed, move more people, increase foot traffic and potential customers for retail, and demonstrate public investment, which tends to draw private development. Major transit investments require a certain amount of concentrated development, pedestrian-focused design, and land use policies for transit-oriented development. Examples of major transit improvements that have helped to stimulate development include Cleveland's HealthLine bus rapid transit, Eugene's Franklin Emerald Express, and Portland's streetcar. The transit projects process can be one to five years for operational improvements, but are 5 to 10 years for projects involving major capital investment.

Funding can come from local, regional, state and federal sources. Local sources include tax measures, public/private partnerships, privately sponsored systems, and fare box revenue. Regional sources include grants administered by the Metropolitan Transportation Commission and Bay Area Air Quality Management District. State sources include the Transportation Development Act, the Public Transportation Account, and the Modernization, Improvement and Service Enhancement Program. Federal Transit Administration programs include New Starts, Very Small Starts, Small Starts, and TIGER (Transportation Investment Generating Economic Recovery) grants.

POLICY ALTERNATIVES

The following information on options was presented at the second round of meetings listed below under Public Outreach/Interest.

Land Use and Future Development: Bay Area Economics and CDM Smith feel that the projected 2035 jobs and population in the area will support the Circulator options described below.

Transit Options Evaluation: The options described below assume that AC Transit service would continue except as changed in the Grid Option, and that Emery Go-Round service would continue unless replaced by one of the new routes.

The Grid Option, shown in Attachment 1, is a set of route changes that AC Transit staff plans to recommend to its board for implementation if funding becomes available. It includes the following changes:

- Line 12 would connect from West Oakland to Downtown Berkeley via Adeline Street and Martin Luther King Jr Way.
- A new Line 13 would connect the Amtrak/Public Market area with Berkeley via Stanford Avenue and would go on to Rockridge, Piedmont, Lake Merritt and Downtown Oakland.
- Line 26 would connect Emeryville Public Market/Amtrak to West Oakland BART via Mandela Parkway.
- Line 49 from Elmwood would extend from West Berkeley via 6th Street and Christie Avenue to Emeryville Public Market/Amtrak.
- Line 57 from Oakland would extend from 40th Street at San Pablo Avenue to Emeryville Public Market/Amtrak via 40th Street and Shellmound Street.

The Trunk Line option was considered but rejected due to low projected ridership because it does not connect to the MacArthur or Ashby BART stations. This option includes a line connecting Hollis Street to North Berkeley BART and a line connecting Shellmound Street to West Oakland BART and Jack London Square.

The Connectors option, which would build on the Grid Option and existing Emery Go-Round, includes four routes as shown in Attachment 2:

- Line A from Ashby BART via Ashby Avenue to 7th and 6th Streets and to either Downtown Berkeley or North Berkeley BART
- Line B from Ashby BART via Ashby Avenue and 65th Street to Christie Avenue and Shellmound Street, and via 40th Street to MacArthur BART (west of the railroad tracks)
- Line C from Ashby BART via Ashby Avenue to Hollis Street and via 40th Street to MacArthur BART (east of the railroad tracks)

- Line D from Summit Medical Center via Broadway and 40th Street to MacArthur BART, then via 40th Street and Mandela Parkway to West Oakland BART, and on to Jack London Square via either 7th Street and Broadway or 3rd Street.

At the first Community Workshop, a variation on the Connectors option arose with overlapping routes to allow travel from West Berkeley or West Oakland to Emeryville without transfers.

Modes: The team evaluated four transit modes, described below and compared on the attached chart.

- Shuttle – fold-out lift for boarding disabled and strollers, 30-45 passengers per vehicle, average speed with stops about 6-11 mph, currently supports existing development in Emeryville, less than 10-year life span.
- Conventional Bus – kneeling bus with ramp for boarding disabled and strollers, 60-80 passengers per vehicle, about 8-14 mph, improves mobility for all and access to businesses, about 10-year life span.
- Enhanced bus – curb extensions for level boarding, 60-80 passengers per vehicle, about 10-16 mph, has helped spur development in Cleveland and Eugene, about 10-year life span.
- Streetcar – curb extension for level boarding, 115-150 passengers per vehicle, about 8-14 mph, has helped spur development in Portland and Seattle, at least 30-year life span.

In comparing capital costs, it should be noted that a streetcar system is a long-term investment that can be amortized over 30 years, while buses are shorter-term investments that are typically amortized over 10 years or less. If capital costs are annualized that way, a streetcar might look worthwhile for Emeryville routes.

Features: Several kinds of features encourage transit use. Service features include vehicle frequency and timed transfers. Vehicle speed is affected by features such as signal priority and curb extensions for boarding. Safety and security of stops can be improved with visibility, cameras and lighting. Other stop improvements include benches, trash bins, landscaping and shelters. Other features include cleanliness of stops and vehicles, real-time arrival information, and on-board wi-fi.

Funding: Improvements would need to be funded by a combination of local, state and federal sources. Local sources could include Property Based Improvement District (PBID) expansion or additional districts, parcel taxes, local gas taxes, developer fees, and/or fares.

PUBLIC OUTREACH/INTEREST

Meeting comments are summarized below. A more detailed description of the outreach process and comments received can be found at http://www.emeryville.org/ebots.

First round of meetings: Community Workshops to elicit input on desired trips, problems and ideas were conducted in West Oakland on November 7, 2013 (23 participants), in West Berkeley on November 9, 2013 (14 participants), and in Emeryville on November 12, 2013 (32 participants). The questionnaire received 827 responses. The study was discussed by the Emeryville Transportation Committee on November 26, 2013; the Emeryville Planning Commission on December 12, 2013; and the Emeryville City Council on January 24, 2014.

The EBOTS Policy Advisory Committee's discussion included the following comments:

- The Measure B transportation sales tax measure election should be postponed until 2016 to make time to revise it to give more to North County, to find new financing for the Emery Go-Round, and to include design for transit in development project design review so we can seize opportunities for bus stops and other transit improvements.
- Transit alone does not attract development but coordinated development incentives, marketing and transit can.
- Bicycle improvements such as road diets (reducing motor vehicle lanes to add bike lanes) can interfere with transit improvements if the two are not coordinated.
- Bike sharing would give more people cycling as a transit access option.

Community Workshop participants provided the following input:

- Several locations are difficult to access by transit, including the West Oakland BART station, Frontage Road, shopping and entertainment in Emeryville, waterfront areas, grocery stores, and Mandela Parkway.
- Desired improvements include service in evenings, late nights and weekends; more neighborhood circulators; reliability; lighting at stops; buses that are easier to board; more routes; increased safety, more AC Transit connections to Emeryville, inter-agency coordination, Emery Go-Round service in West Oakland, and complete networks where bicycles and buses are on different streets.
- Long-term wishes include streetcars, non-polluting buses, bus rapid transit on San Pablo Avenue, transit-supportive parking policies, and Wi-Fi on local buses.
- Acceptable trade-offs included removal of parking on some streets and travel lanes on others - negotiated with local businesses - and residents paying for expanded Emery Go-Round service.

Questionnaire responses provided data on the following topics:

- Respondents' relationship to the area
- Trips to, from and within the area for commuting, shopping and other purposes
- Travel methods for various types of trips
- Starting points and travel method for trips to San Francisco, Downtown Berkeley, Downtown Oakland, Emeryville and BART
- Trip difficulty and reasons (infrequent and unreliable service, traffic congestion, limited parking, poor connectivity between modes, limited Emery Go-Round service, and

inadequate access to specific locations including West Oakland BART, Jack London Square, Mandela Parkway, and West Oakland to North Berkeley)
- Desired transit improvements (evening and weekend service, accurate real-time arrival information, additional shuttle service, and safety)

The Emeryville Transportation Committee had these comments:
- Going to San Francisco via West Oakland BART station saves 20 to 30 minutes and some fare money compared to going from the MacArthur station.
- We will need better transit for the density that is planned in Emeryville and West Oakland. AC Transit should restore service to the Marina.

The Emeryville Planning Commission made the following comments:
- We need connections to waterfronts, shopping, entertainment, the West Oakland BART Station, downtown Berkeley, 4th Street, and University Avenue.
- For efficiency AC Transit should reduce the number of F bus stops on Market Street, and educate passengers to exit via rear doors.
- The most important features are frequency, longer hours, reliability, clean fuel, and bus stop maintenance, lighting and safety.
- On-street parking could be given up for transit, and we could require bus pullouts, shelters, transit passes, and other forms of transportation demand management in new development.
- Transit generally needs stable funding sources.
- BART should focus on urban rather than suburban extensions.

The Emeryville City Council provided the following direction:
- We need regional solutions and funding; transit should not be a bunch of little agencies.
- Emery Go-Round is not reliable or frequent; it is funded because AC Transit didn't serve us well.
- Funding should be steady and controlled by public entities.
- We need better service to University of California, Berkeley.
- People want service from Emeryville to West Oakland BART.

Second Round of Meetings: Community Workshops to elicit responses to draft options (described below under Policy Options) were conducted in Emeryville on May 8, 2014 (14 participants), West Oakland on May 10, 2014 (18 participants), and in West Berkeley on May 13, 2014 (11 participants). The questionnaire on the options received 502 responses. The options were discussed by the Emeryville Transportation Management Association (which runs the Emery Go-Round) on May 15, 2014; the AC Transit Board on June 11, 2014; the Emeryville Planning Commission on May 22, 2014; the Emeryville Transportation Committee on May 27, 2014; the Emeryville City Council on June 17, 2014; and the Berkeley Transportation Commission on June 19, 2014.

Highlights of the April EBOTS Policy Advisory Committee discussion are listed below:

- Connect to downtown Berkeley, 4th Street/Amtrak, Emeryville, Jack London Square and downtown Oakland
- Ashby is too slow; Stanford-Powell is fast
- North end should go to North Berkeley BART and south end should go on 3rd Street to Jack London Square/Oakland Amtrak
- BART is studying service on Union Pacific railroad corridor from Richmond to West Oakland
- Level boarding is more accessible for disabled and strollers, and improves transit speed
- Establish a bus system first, evaluate ridership, then plan streetcar track locations (side or center of street) and figure out how to deal with bikes and utilities
- Reduced driving would improve air quality and reduce health problems - Emeryville has higher rates of child hospitalization for asthma than West Oakland
- Non-commuters want hub-to-hub service for ages 8 to 80
- Emery Go-Round can go to West Oakland if funding can be figured out; it takes political will in Oakland to allocate resources; if there were a West Oakland PBID we could work it out
- Make EZ Pass a condition of approval for development
- It's hard to get on BART at West Oakland at peak time, so AC Transit is increasing transbay service.

Community Workshop participants expressed the following opinions:

- We need a better connection from Emeryville to Downtown Berkeley and North Berkeley
- We support AC Transit extensions into Emeryville.
- We like the overlapping Connector 2 Concept that emerged from the first workshop.
- A variation on this that emerged at the third workshop would be to have one line extend all the way from Berkeley to West Oakland/Jack London Square via Hollis Street, similar to the Trunk Line concept, with a second route extending from Ashby BART to MacArthur BART via Ashby Avenue, Shellmound, and 40th Streets.

Major questionnaire responses are summarized below:

- Wait time could be up to 10 minutes (55%)
- Fewer stops for faster travel (62%)
- Express/Rapid Bus best mode (39%; streetcar 21%, no preference 29%)
- More people would use
  - Emery Go-Round routes
  - Emeryville to West Oakland BART
  - Public Market to Rockridge
  - 57 on 40th - Shellmound
- Connect Emeryville to West Oakland, West Berkeley, downtown Berkeley, and San Francisco
- Keep and enhance Emery Go-Round

- Connect Watergate Condos to rest of Emeryville and BART
- Increase speed, frequency, reliability, and safety
- Expand hours to nights and weekends
- Reduce pollution and fares
- Provide shelters, comfortable vehicles and smoother ride

The Emeryville Transportation Management Association (ETMA) made the following recommendations:

- Extend the AC Transit 57 bus up Shellmound
- Connect central Emeryville directly to downtown Berkeley
- Overlapping connectors option is good –
  - North-south connection near the Bay
  - Connecting Emeryville to West Oakland
- Bus pullouts in parking lane with red curb are needed
- Phase modes – buses test routes, plan for future rail
- People take transit to IKEA and take delivery
- Reduce wait time and improve reliability
- Improve security
- Shelters are hard to maintain; cleanliness is important
- Provide benches and trash cans
- Fare collection is hard and slows boarding, especially cash
  - Use Clipper card, honor system and/or kiosks on the street
- Allocate Measure B funding for this

The Emeryville Planning Commissioners' comments are summarized below:

- Watergate residents need service within Emeryville and to BART
- Maps should show all existing and proposed service
- Emery Go-Round should be addressed and integrated
- Provide direct service to downtown Berkeley
- Eliminate two-thirds of the F bus stops on Market Street
- Focus on a north-south route from Jack London Square to North Berkeley BART
- Phasing could be first enhanced bus, then Bus Rapid Transit, then streetcar
- San Pablo Avenue could be the first place for a streetcar
- Work with Oakland, Berkeley, Albany and El Cerrito
- A north-south route connecting North Berkeley BART with Jack London Square and West Oakland BART via Hollis could be combined with a route from MacArthur BART to Ashby BART via Shellmound
- The most important features are short wait times, fast travel, real time arrival information, safety, coordinated arrivals, and cleanliness on buses
- We need 24 hour service to and from San Francisco – BART and/or the F bus
- Paid parking could help fund service

The Emeryville Transportation Committee's comments are summarized below:

- Connect Watergate condominiums to stores, Senior Center, etc. as well as to BART
- Include Peninsula transit on the map; show existing service
- Extending the AC Transit 13 to the Peninsula would not connect Watergate to Emeryville destinations
- Include the Emery Go-Round in the analysis
- Talk with the Emery Go-Round Task Force
- Focus on the original trunk line concept from North Berkeley BART to West Oakland BART
- Adding other routes makes the proposal too complex and could reduce support
- Density in the corridor will increase, and people will want to travel between West Oakland and North Berkeley
- Show ridership projections for San Pablo Avenue
- Connectors to BART come after the main line
- A public-private partnership could fund the service
- Consider BART's effort to put local passenger service on the Union Pacific right-of-way
- Phase in enhanced bus, then Bus Rapid Transit, then streetcar
- Talk with Alameda County Transportation Commission about potential operators

The AC Transit Board had the following comments:

- Streetcar power and way maintenance partly offsets cost savings from fewer drivers.
- Shuttle drivers' compensation is very poor compared to AC Transit divers' compensation.
- The new service needs to mesh with the West Oakland Specific Plan.
- Emery Go-Round takes riders from AC Transit, but maybe its service is not adequate.

The Emeryville City Council provided the following direction:

- Consider various kinds of riders –commuters, transit dependent people, former drivers, shoppers, people who come home from work late at night.
- Medical destinations are good.
- Transfers between Connectors to go north-south would lose riders.
- Focus on the north-south connection within the study area.
- Increasing AC Transit service would be good in the short term.
- Long-term connecting of the region requires the Alameda County Transportation Commission, the Metropolitan Transportation Commission, and BART to be partners.
- Streetcars would attract more passengers, getting them out of their cars and reducing pollution, which would reduce asthma rates.
- Look at streets that could accommodate streetcar in exclusive right-of-way such as Mandela, or on a low-traffic street such as Horton, or on the Union Pacific Railroad right-of-way.
- Look at the best way to encourage more riders in the long term.

- Bus rapid transit slated for International Boulevard and San Jose include raised platforms similar to Market Street in San Francisco, for level boarding similar to a streetcar.

NEXT STEPS:

A draft report will be presented to the multi-city Policy Advisory Committee in September 2014, followed by presentations to City of Emeryville, Berkeley and Oakland Councils and Boards in October 2014. The presentation to the Oakland City Council will probably be combined with Oakland staff's presentation on the City of Oakland's current downtown Broadway Corridor transit study. Adoption hearings will be held at the Emeryville Planning Commission level in December 2014 and at the Emeryville Council and Board level in January 2015.

COORDINATION

The City of Oakland, including staff of Public Works, Planning and Economic Development, has participated in the various Technical Advisory Committees, and has been in contact with the City of Emeryville's staff as well as consultant team, and the Mayor's Office has representation on the Policy Advisory Committee. The Broadway study staff members have met with the project staff and consultants, and are on the EBOTS Technical Advisory Committee email list. The Consultants have been following the recommendations and discussions of the West Oakland Specific Plan, and are furthering the WOSP proposed recommendations to provide more detailed analysis of transit linkages and access for West Oakland residents and employees

This report has been reviewed by the Office of the City Attorney and by the Budget Office.

COST SUMMARY/IMPLICATIONS

There are no cost implications to the EBOT study at this time.

SUSTAINABLE OPPORTUNITIES

Economic: This Study includes analysis of linkages to employment destinations and corridors within the subject planning area, thereby providing potential future benefit for access for West Oakland residents and employees.

Environmental: This Study furthers the goals of improving transit access within West Oakland, and linkages to destinations in Emeryville and Berkeley.

Social Equity: This Study considers the inequity of access to transit and transportation by low income residents of the EBOT Study area, including West Oakland, and proposes improvements to access to transit.

For questions regarding this report, please contact Margot Lederer, Department of Economic & Workforce Development, 510-238-6766.

Respectfully submitted,

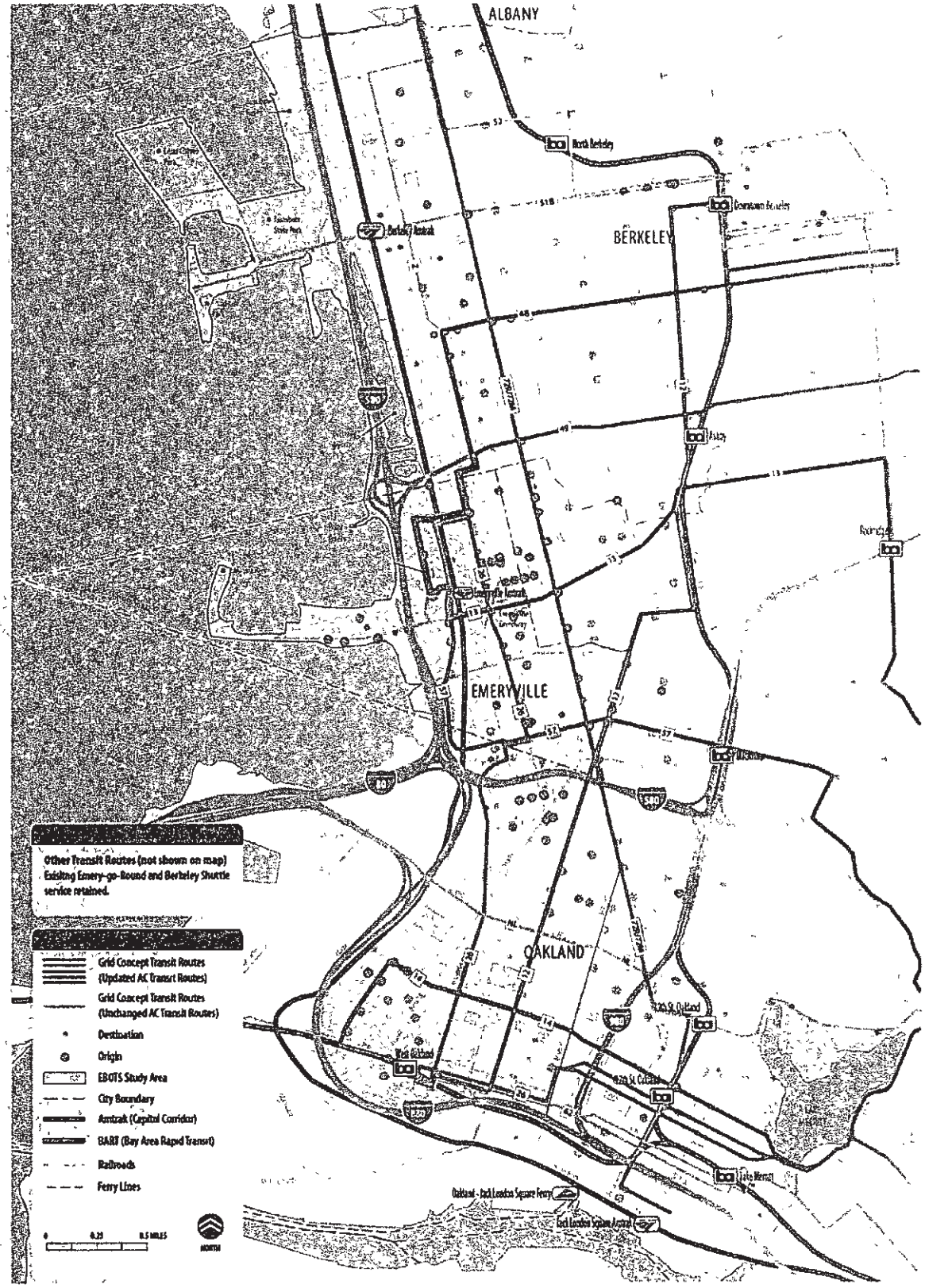
Rachel Flynn, Acting Director
Economic & Workforce Development Department

Prepared by:
Margot Lederer Prado, Urban Economic Analyst IV

Attachments:

Attachment A: Grid Service Concept
Attachment B: Connector Service Concept

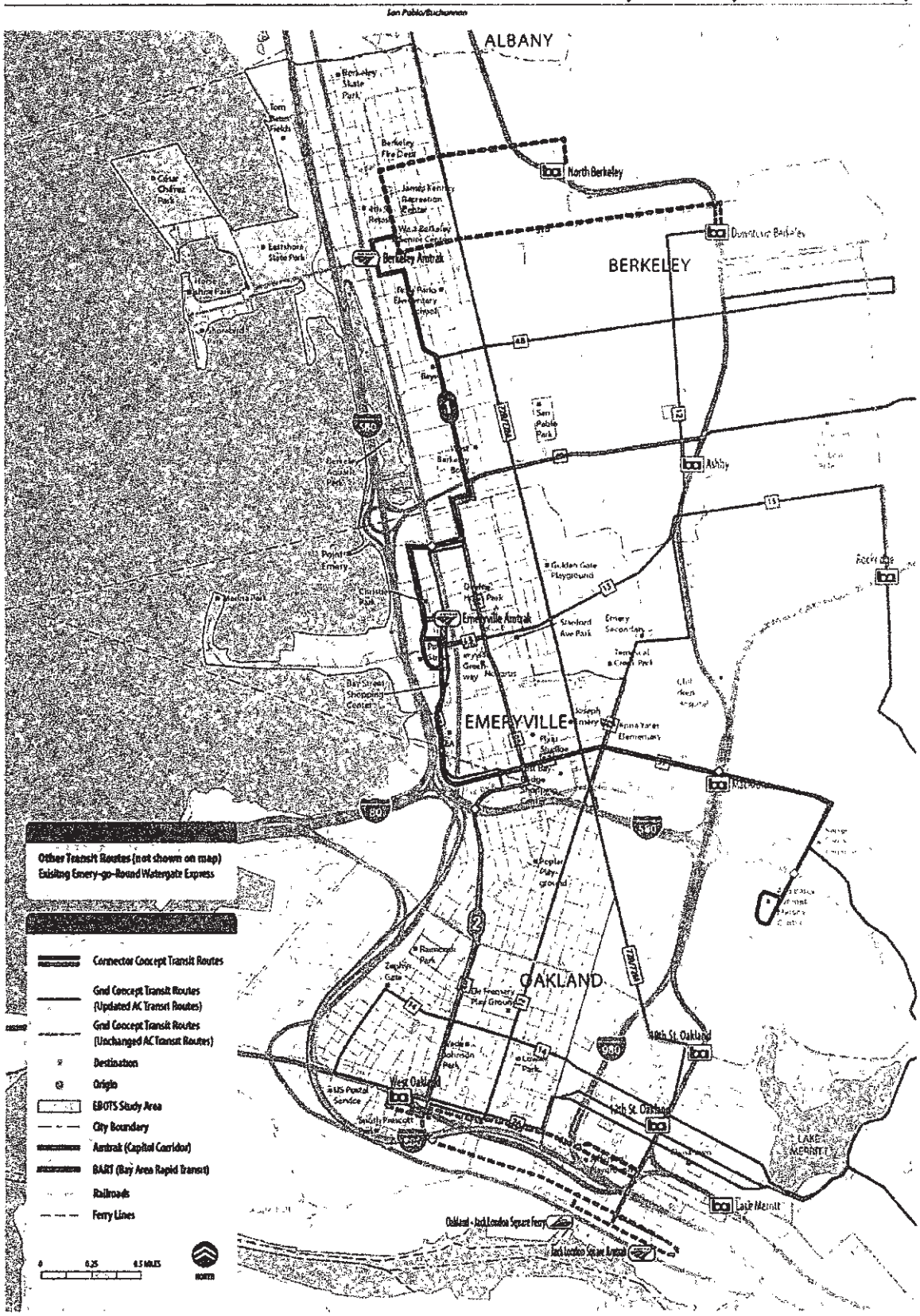
Item: _____
CED Committee
July 22, 2014



DRAFT - FOR PLANNING AND DISCUSSION PURPOSES ONLY

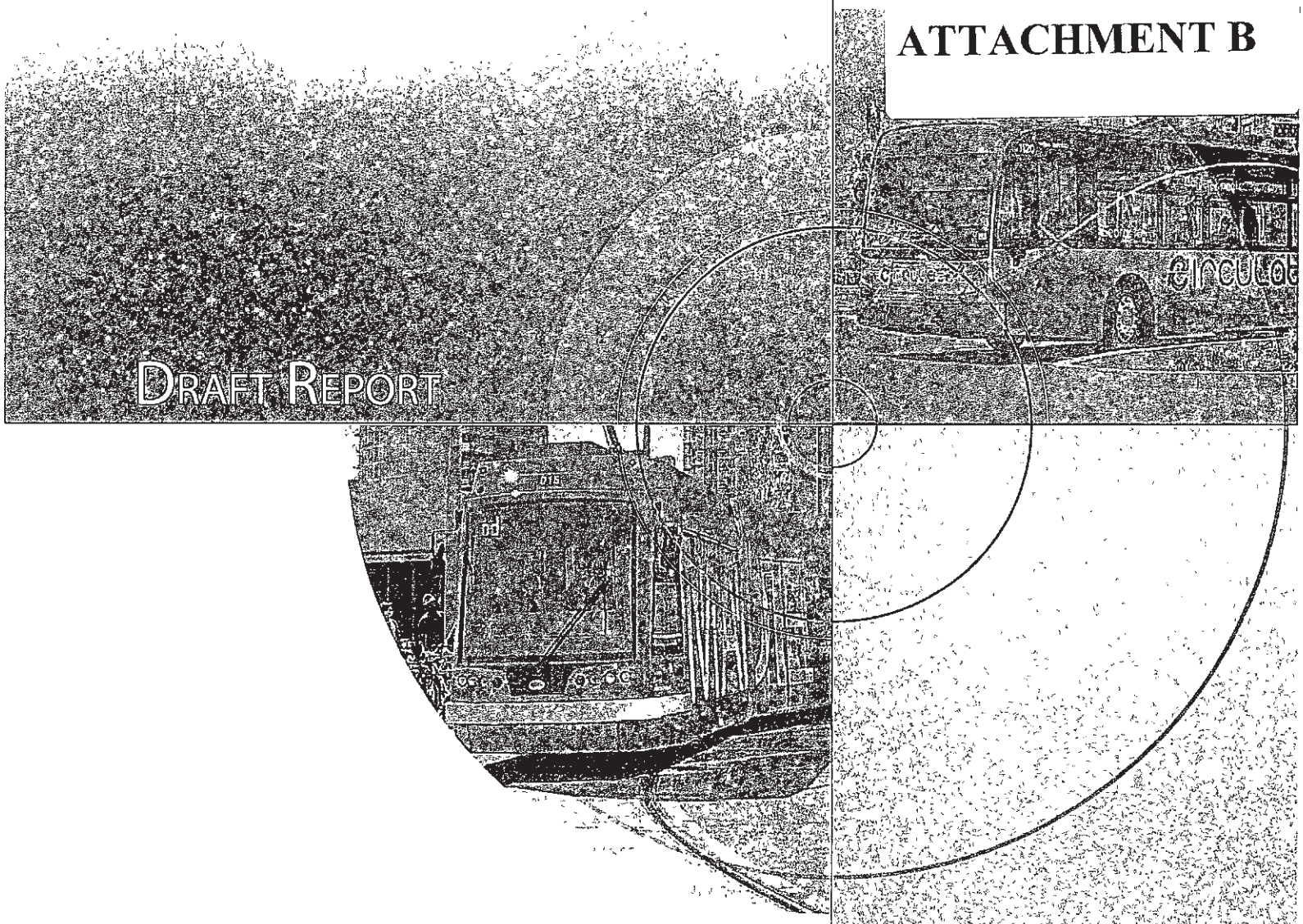
Updated AC Transit Routes - Grid Service Concept

ATTACHMENT A



ATTACHMENT B

ATTACHMENT B



DRAFT REPORT

Emeryville Berkeley Oakland Transit Study

September 2014

This project was completed in collaboration with:

City of Berkeley
City of Oakland
AC Transit
Bay Area Rapid Transit
Amtrak Capitol Corridor
Emeryville Transportation Management Association
West Berkeley Transportation Management Association
Alameda County Transportation Commission
Metropolitan Transportation Commission

City of Emeryville
1333 Park Avenue
Emeryville, CA 94608

Emeryville Berkeley Oakland Transit Study

September 2014

Prepared by:

CDM Smith

In association with:

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BAE Urban Economics

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City of Emeryville

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Berkeley Chamber of Commerce – Erik Holland

Emeryville Chamber of Commerce – Bob Canter

Oakland Metropolitan Chamber of Commerce – Charissa Frank

West Oakland Commerce Association – Steve Lowe

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Emeryville Resident – John Scheuerman

Oakland Residents – Suzanne Loosen, Ray Kidd

East Bay Housing Organizations – Daun Lounds

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Councils, Boards, Committees and Groups

Berkeley City Council

Emeryville City Council

Oakland City Council

Alameda- Contra Costa Transit Board

Bay Area Rapid Transit Board of Directors

Emeryville Transportation Management Association

Berkeley Transportation Commission

Emeryville Economic Development Committee

Emeryville Planning Commission

Emeryville Transportation Committee

Oakland Community Economic Development Committee

Oakland Planning Commission

West Oakland Business Alert

West Oakland Neighbors

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BAE Urban Economics – Ron Golem, Jessica Hitchcock

Nancy Whelan Consulting – Nancy Whelan, Tina Spencer

Caltrans Staff

Project Manager - Sergio Ruiz

Project Supervisor – Becky Frank

1. Project Background

The purpose of the Emeryville Berkeley Oakland Transit Study (EBOTS) is to explore future visions for the study area with respect to transit as it relates to land use in Emeryville, West Berkeley, and West Oakland Planned population and job growth and increased investment in the area will spur the need for additional transportation investments, including transit, pedestrian, and bicycle improvements. The corridor is a jobs-rich environment with more employment than housing, mobility improvements offer the potential for improved access to jobs for those living in, near, or commuting to the corridor

This report is organized by discussing the background and planning process, the transit context of the study area, reviewing the proposed improvements, evaluating them, then finally discussing implementation and funding.

- **Section One** describes the project background
- **Section Two** discusses the planning process, community engagement, and iterative process that led to the development of the proposed routes
- **Section Three** provides a description of the transit context in the EBOTS study area including planned improvements
- **Section Four** provides a description of the proposed transit improvements for the EBOTS study area
- **Section Five** includes an evaluation of the proposed routes based on a range of factors, including ridership, vehicle miles traveled, environmental justice, safety and security, costs, economic development, and compatibility with existing transit
- **Section Six** includes a high-level look at the funding and implementation strategy.

Technical Advisory Committee (TAC)

The Technical Advisory Committee (TAC) is made up of representatives from the City of Emeryville, City of Berkeley, City of Oakland, AC Transit, BART, Amtrak Capitol Corridor, Emeryville Transportation Management Association (ETMA), West Berkeley Transportation Management Association, Alameda County Transportation Commission, and Metropolitan Transportation Commission The TAC met bi-monthly throughout the planning process, providing technical review of materials, ensuring accurate and up-to-date information, and allowing representatives from jurisdictions and agencies to coordinate and discuss improvements. Much of the work presented in this report is a culmination of input received from this committee

Project Goals and Objectives

The Technical Advisory Committee has identified the following goals and objectives for the EBOTS corridor:

- Creating an environment where a car is not required for mobility,
- Using transit to create a well-connected and cohesive corridor with good access to jobs, education and recreation,
- Coordinating transit improvements with future population and job growth to help spur economic development,
- Making near-term transportation improvements including bus route modifications, new shuttle operations, and transit reliability and frequency increases; and
- Enhancing long-term mobility within the corridor, possibly including new transit service such as streetcar or bus rapid transit

2. Planning Process

Process of Developing Options

Initial routes and concepts for transit improvement within the EBOTS study area used a "blank slate" approach, with receptivity to ideas received from the community, as well as existing plans, future land use plans and economic development goals. A wide range of transportation technology options and improvements were screened based on distance, usage and future ridership Options were evaluated and presented through community meetings, the technical advisory committee, and review by additional local professionals Several iterations took place before the options and evaluations presented in this document were completed.

The first stage in devising new transit services for the area was to identify those streets with active land uses that would generate transit trips as well as those with potential for future job and population growth These land uses include multifamily residential buildings, business offices, medical complexes and retail commercial facilities. The streets serving these land uses should be suitable in terms of width and traffic characteristics to be able to accommodate transit vehicles This first round of service development concentrated on bus and small shuttle vehicles, while also considering the possible implementation of streetcars. Where possible, a series of streets was sought that would form a continuous corridor of travel Such straight corridors are easier for patrons to understand and allow for more efficient transit operation by reducing the number of turns required

Several north-south streets were examined as candidates for service. San Pablo Avenue is among the area's busiest thoroughfares, but it lies at the east margin of the study area and has already been the subject of transit service proposals in AC Transit's Comprehensive Operations Analysis (COA) Other streets allowing for north-south continuity in the three cities are

- Adeline Street (southern portion), Mandela Parkway, and Peralta Street in Oakland,
- Hollis Street, Shellmound Street, and West Frontage Road in Emeryville, and
- 6th and 7th Streets in Berkeley

East-west streets in the study area (and areas further east) include

- 2nd/3rd Street couplet, 7th/8th Street couplet, West Grand Avenue and MacArthur Boulevard in Oakland,
- 40th Street, Powell Street/Stanford Avenue, 65th Street in Emeryville and parts of Oakland, and
- Ashby Avenue, Dwight Way and University Avenue in Berkeley

Connections further north of the study area's border with the City of Albany were examined as well but discontinuities in the street system made transit routings too circuitous. Moreover, possible termini north of this border, such as the BART stations at El Cerrito Plaza or El Cerrito Del Norte, stretch what can be served by the local transit concepts under consideration in this study. These northern points might,

however, be tied to Transbay routes serving the study area Street connections further west and south of the study area are not possible because the existing street network ends at the freeways and San Francisco Bay shoreline.

Possible terminals and destinations to be served were examined both inside and outside the study area It is generally desirable to terminate a transit line at a point where significant trips will be generated Given the emphasis of EBOTS routes as transit collectors and distributors, as well as short-distance connectors, a terminal or way station at a transfer point with other modes or transit lines is especially important The key transfer points in or close to this study area include

- Amtrak/Capital Corridor stations at Oakland Jack London Square, Emeryville, and Berkeley,
- BART station at West Oakland, with possible connections to stations outside the study area at 19th Street, MacArthur, Ashby, Downtown Berkeley, and North Berkeley,
- AC Transit Uptown Transit Center at 20th & Broadway, and
- Ferry terminal at Jack London Square (with a possible future terminal in Berkeley)

In addition to these transfer points, transit should serve important destinations in the area They include numerous employment centers, like Pixar and Bayer, and retail centers such as the Bay Street, Powell Street and East Bay Bridge shopping centers Major medical facilities are located mostly outside the study area and need to be tied to it, a function now handled largely through independent shuttles from BART stations, these include the Kaiser, Alta Bates Summit, and Children's Hospital complexes in Oakland

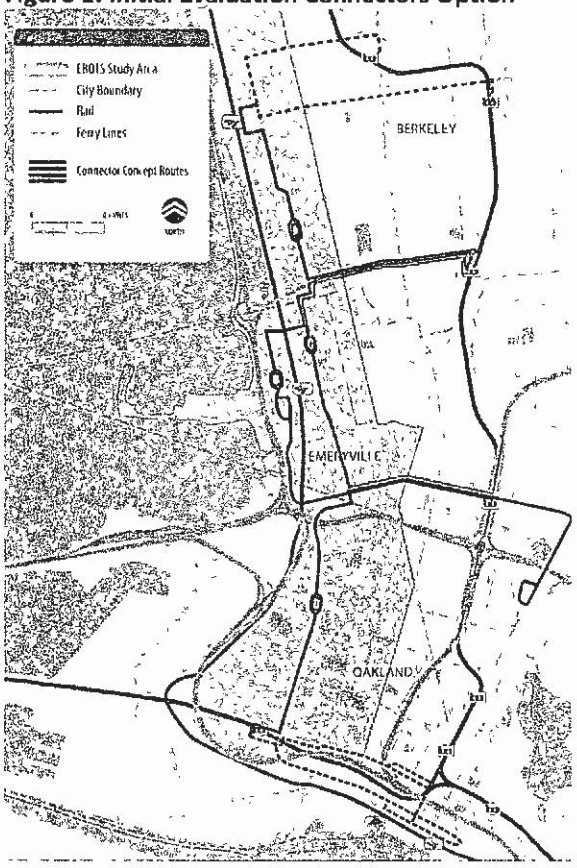
In order to formulate transit service concepts for the EBOTS study area, the study included numerous sources of information These sources include existing and projected patterns of development, travel desires revealed by those who responded to the study's Community Questionnaires, planning documents from the three jurisdictions, and comments expressed at the three first-round public meetings and three second-round public meetings Analysis of these data was followed by reconnaissance of the study area through maps, aerial photos, and windshield surveys to better understand its existing street infrastructure and surrounding built environment

Concepts Studied

Several alternative routes were evaluated for costs, ridership, and demand and reviewed by the TAC and community outreach These alternatives helped form the basis of developing the transit routes proposed in this report. A wide range of technology options were initially considered based on community input and compatibility with the study area These transit technologies were initially screened to narrow the consideration to the best technologies given community input, right-of-way and environmental constraints, and political realities in terms of project funding

A "Connectors" option, shown in **Figure 1**, was considered and was well-regarded by the community and TAC members However, these routes were ultimately screened out due to overlapping routes with existing and already planned transit routes For example, within Emeryville, the Emery Go-Round served many any of the roadways in the proposed Connector option. Additionally, planned AC Transit routes would be duplicated with nearly all the connector routes within the Study Area This circumstance would reduce route efficiency and cause too much shift in ridership away from the planned AC Transit routes Furthermore, the planned AC Transit routes provide more extended coverage into other parts of Berkeley and Oakland.

Figure 1: Initial Evaluation Connectors Option



Community Engagement

Round 1 Outreach and Community Feedback

Overview

Between August 2013 and November 2013, the EBOTS project team conducted a variety of outreach activities to inform stakeholders and the public about the project, and to solicit input on future visions for transit in the study area This outreach effort was part of Phase 1 of EBOTS, which sought to identify both opportunities and constraints associated with improving transit service in the study corridor, in order to assist the partner cities and agencies involved in the TAC with engaging a broad spectrum of stakeholders in the transit study Specifically, the objectives of the public process were to inform and collect input from the public on transit services and improvements within the study area

The outreach activities included three community workshops held across the study area (one in each city) and a bilingual (English and Spanish) questionnaire used to collect information regarding how individuals travel within the study area (i.e., travel method) and to gather feedback on potential transit improvements MIG, the public engagement consultant, conducted a robust bilingual outreach effort to publicize the community workshops and survey questionnaire, including targeted postcard and flyer

distribution, e-blasts, news media articles, and phone calls to key Emeryville-Berkeley-Oakland partners such as community-based organizations, local churches and established civic groups

Key Findings

Round 1 of the community meetings identified location-specific access needs, identified many locations that are currently difficult to access and improved service in terms of schedule, reliability, hours of service, and frequency Participants expressed a desire for shuttle/paratransit service in identifying need for last-mile connections and Emery Go-Round service in West Oakland Participants also expressed interest in bus transit improvements Some key opportunities for bus transit service identified include

1 Connect to key locations in West Oakland, Emeryville, and West Berkeley, including:
   - Jack London Square
   - Oakland Army Base
   - Waterfront areas
   - West Oakland BART
   - Mandela Parkway
   - Berkeley Marina
   - Berkeley Bowl West
   - Fourth Street in Berkeley
   - Frontage Road
   - Emeryville shopping

2. Improve service, including
   - More off-peak service
   - Schedule reliability
   - Schedule predictability
   - Better coordination between transit agencies
   - Better connections to West Oakland BART
   - Local circulation

3 Improve amenities, including:
   - Real-time arrival information
   - Lighting at bus stops
   - Vehicle improvements
   - Increased safety measures

Detailed description of the workshop format, questionnaire and key findings from Round 1 of the Community Engagement and Outreach can be found in the Appendix B.

Round 2 Outreach and Community Feedback

Overview

Between March 2014 and May 2014, the EBOTS project team conducted the second phase of outreach efforts to evaluate ideas for improving transit in the study area Based on public input collected during Phase 1 outreach, the project team developed potential options for better transit in these communities

The outreach activities included three community workshops held across the study area (one in each city) and a questionnaire used to collect information regarding preferences and priorities for travel within the study area As in Phase 1, the public engagement process included a range of outreach channels, including communication in local media outlets, the City of Emeryville website, e-blasts, social media communications, bilingual postcards and flyers, information distributed through local officials, regular newsletters, and phone calls to key Emeryville-Berkeley-Oakland partners such as community-based organizations, local churches and established civic groups.

Key Findings

The outreach meetings discussed travel patterns of participants, including destinations of interest. The meetings also focused on reasons for trip difficulty in the study area and discussed specific locations that have inadequate access by transit Participants expressed desires for similar interest categories as in the first round of community engagement, with particular focus on the following

1 Connect to key locations
   - Jack London Square
   - West Oakland BART
   - Grocery stores
   - 4th Street
   - Emeryville shopping
   - Berkeley Marina
   - Berkeley Bowl West
   - Fourth Street in Berkeley
   - Frontage Road

2 Improve service
   - Schedule reliability
   - More off-peak service
   - Schedule frequency
   - Faster service
   - Reduce or eliminate need for transfers
   - Expanded overall service
   - Earlier weekday morning service

3 Improve amenities
   - Improved real-time arrival information
   - Level boarding
   - Dual side doors
   - disabled accessibility
   - Safe, pedestrian-friendly stops
   - Well-lit shelters with benches
   - Additional bicycle racks on buses
   - Clearer bus route information

Detailed description of the workshop format, questionnaire and key findings from Round 2 of the Community Engagement and Outreach can be found in the Appendix C

3. Transit Context

This section explains the background and context of current transit systems within the EBOTS study area as well as planned improvements for these systems. Further information regarding the existing transportation conditions in the study area can be found in Appendix D. Existing conditions as well as current efforts for updating transit systems in a short-term timeframe are included in this section

Transit Markets

The transit markets served within the study area include "transbay" commuters traveling to and from San Francisco, local travelers traveling between destinations within the study area and nearby destinations outside the study area, and intra-corridor travelers traveling within the study area While BART is used for transbay and local travel, no intra-corridor travel occurs on BART since there is only one BART station (West Oakland station) within the study area **Table 1** lists the existing transit markets served by each major transit mode

Table 1: Existing Transit Markets and Service

Traveler type	BART	Capitol Corridor	San Francisco Bay Ferry	AC Transit Transbay Routes	AC Transit Local Routes	Emeryville & Berkeley Shuttles
Transbay *Traveling to- and from- San Francisco to study area*	✓	✓	✓	✓		
Local *Traveling to- or from- the study area*	✓			✓	✓	✓
Intra-corridor *Traveling within study area*				✓	✓	✓

Existing Context

Within the study area, the existing transit context is dominated by shuttles, Alameda-Contra Costa Transit District (AC Transit) bus system, as well as the Bay Area Rapid Transit (BART) light rail system **Figure 2** shows the existing shuttle, AC Transit, and BART system routes

Shuttles

Emery Go-Round

Emery Go-Round is a free shuttle system funded by the City of Emeryville's Business Improvement District, and operated by the Emeryville Transportation Management Association (ETMA). The shuttle system has three routes that provide service seven days per week (weekend service is limited) Emery Go-Round serves as a transit connection to MacArthur BART station, the Emeryville Amtrak station, and the West Berkeley shuttle system These routes also serve the large shopping centers in addition to many schools, grocery stores, and other businesses

Annual ridership for the Emery Go-Round exceeds 1 5 million trips [1] Approximate number of boardings and alightings for each route are listed below

- Hollis shuttle line (weekday only): 527,000 trips per year
- Shellmound/Powell line (weekend and weekday) 867,000 trips per year
- Watergate Express (weekday peak-period only). 153,000 trips per year

West Berkeley Shuttle

The West Berkeley Shuttle provides weekday commuter service from Ashby BART station to the area West of Ashby BART station—extending nearly to Berkeley's Aquatic Park on the San Francisco Bay During the morning commute period, the shuttle runs from 5·40AM-9·11AM, during the evening commute period, the shuttle runs from 3PM-6 17PM. Each of the two lines, serving similar routes, travel east-west on Ashby Avenue and Dwight Way and north-south on San Pablo Avenue and 7th St The shuttle service is operated by the Emeryville Transportation Management Association under contract to the West Berkeley Transportation Management Association.

As of December 2007, the West Berkeley Shuttle had an average of 100 boardings per weekday in the study area alone (Existing Conditions Report, Wilbur Smith Associates)

Other Shuttle Services

Downtown Oakland's Free Broadway Shuttle (not in study area), or the "Free B", connects 12th Street and 19th Street Oakland BART stations, the Oakland-Jack London Square Ferry Terminal, and the Jack London Square Amtrak station The Free B offers weekday service from 7AM-7PM and weekend night service from 7PM-1AM on Fridays and 6PM-1AM on Saturdays

Alameda-Contra Costa Transit District (AC Transit)

The Alameda-Contra Costa Transit District (AC Transit) provides bus service to in the East Bay within Alameda and Contra Costa counties as well as to San Francisco's Transbay Terminal In addition to providing local bus-line connections, many AC Transit routes connect to alternative transit modes, including BART, the Capital Corridor, the Alameda-Oakland Ferry, and the Emery Go-Round

Several Transbay lines have stops within the project area Transbay lines are typically represented by letters instead of numbers. Bus lines 800-899 are all-nighter lines, operating from 1AM-5AM. Altogether, 25 routes run through the project area,[2] with 10 of those connecting to the Transbay Terminal in San Francisco. The Routes in the project area include:

- Transbay Routes· F, FS, G, C, H, Z, J, NL, 800
- East Bay Only Routes. 25, 26, 31, 314, 62, 88, 49, 51B, 802, 72, 72M, 72R, 57, 62, 52

[1] Ridership data calculated with trip data from March 2013 – June 2013 Data provided by the Emeryville Transportation Management Association, personal communication July 19, 2013

[2] Several routes have limited stops within the study area The G and FS only have a total of 3 stops in the study area and are not included

Bay Area Rapid Transit (BART)

While only one station, the West Oakland BART station, exists within the EBOTS study area, the BART system has a large impact on transbay and local travel to the study area Transit patterns within the EBOTS study area are mostly affected by transfers from West Oakland, Downtown Oakland, MacArthur, Ashby, and Berkeley BART stations Outreach meetings and questionnaires showed that there is strong demand for improved connections and service from these stations Particular attention in this study is given to the West Oakland station (due to the low quality of current connections and its location within the study area) and MacArthur BART station (due to its high demand as the busiest East Bay station outside Downtown Oakland)

Planned Improvements

Shuttles

The following are planned updates to the Emery Go-Round, West Berkeley, and "Free B" shuttles, as well as the proposed Emeryville Bus Hub. The improvements to the "Free B" shuttle are described in the subsequent section discussing the Broadway Streetcar Project

Emery Go-Round Shuttle

The Emery Go-Round Shuttle planned route updates including the Hollis (HS), Watergate Express (WE), and the Shellmound (SP) [3] Overall, the addition of one route will expand the Emery Go-Round service approximately 25%, specifically focusing on increasing service to some of the most crowded portions of the system Route changes to each line include.

- Hollis Shuttle line Minor changes to this route are planned, such removing one stop on Stanford Avenue at Horton Street westbound
- Shellmound line (previously the Shellmound/Powell Route) The Shellmound Route will travel unchanged from MacArthur BART station, but will be truncated to turn around at Shellmound Way rather than continuing to 65th Street Service the Emeryville peninsula will only be during off-peak periods Frequency would increase due to route shortening
- Powell Bridge line. The new Powell Bridge Route will travel from MacArthur BART on Hollis Street to Powell Street and 65th Street, an area previously served by the Shellmound/Powell Route
- Watergate Express line. There will be no changes made to the Watergate Express Shuttle.

The Emeryville Bus Hub

The Emeryville Bus Hub is a proposed new bus transit hub near the public Market and adjacent to the pedestrian bridge to connect to the Amtrak Station Many of the potential AC Transit and Emery Go-Round routes connect to this location.

Alameda-Contra Costa Transit District (AC Transit)

AC Transit has planned route updates based on the ongoing Inner East Bay Comprehensive Operations Analysis (COA). The COA recommendations increase focus and added service to the Emeryville, West Berkeley, and West Oakland areas In Emeryville and West Oakland, every AC Transit route has

[3] Fehr and Peers Recommendations, February 7, 2014

proposed changes to provide better east-west connections to Downtown Oakland, Downtown Berkeley and nearby BART stations. **Figure 3** shows an image of the short-term improvements.

These improvements address the concerns identified by the community during the outreach process in regard to improving bus service in the study area The following key themes identified during the community workshops and through the questionnaire are met by the aforementioned improvements.

- Improved East-West connections;
- Improved connections to Emeryville from West Oakland, Berkeley via Ashby, Berkeley via Alcatraz, Downtown Berkeley and UC Berkeley, and
- Improved frequency of service.

Based on input received during community workshops, from community input and from discussions during TAC meetings some modifications to the COA routes have been identified. These are noted in the new and updated routes below as well as in Section 4 Proposed Transit Improvements

New and Updated routes

AC Transit is proposing the following service changes. All routes would have a peak frequency of 15 minutes, except 10 minutes for the 72R The potential changes are.

- Line 12 This line would be revised and no longer extend into downtown Oakland and Piedmont It would instead connect from West Oakland to Downtown Berkeley directly
- Route 13 New AC Transit Route would connect the Emeryville Public Market with Berkeley, Rockridge, Piedmont, Lake Merritt, and Downtown Oakland It would have stops in areas that Line 12 currently covers
- Line 14: This line would be extended into West Oakland with a loop on 14th, Wood, and 7th. This revised line would cover areas currently served by Line 26 and provide access from West Oakland into Downtown Oakland, Lake Merritt, Fruitvale and other East Oakland neighborhoods.
- Line 26 This line would be streamlined to no longer loop around West Oakland and instead provide direct access into Emeryville via Mandela Parkway, terminating at Emeryville Public Market and a pedestrian bridge to Amtrak
- Line 48: Line 48 would connect northwest Berkeley to Ashby BART, Elmwood and Claremont in Berkeley via 6th, 7th and Ashby.
- Proposed change from AC Transit COA recommendation· have line 48 travel north on 6th to extend into West Berkeley to Gilman and not connect to the Emeryville Public Market.
- Line 49. Line 49 would be altered to connect the Emeryville Public Market to portions of West Berkeley, Downtown Berkeley and UC Berkeley via Dwight. At Shattuck, the line would travel north, then loop on Durant, Telegraph and Bancroft to connect to the UC Berkeley Campus

- Proposed change from AC Transit COA recommendation: Go north on Shattuck and connect to UC Berkeley Campus on Bancroft and Durant.

- Line 57 This line would be extended into Emeryville and terminate at the Emeryville Public Market This revised route would provide new East-West access from Emeryville into Oakland

- Line 72/72R/72M: These lines would be consolidated and revised to streamline service Line 72 would be eliminated The number of stops would be increased on 72R

Retained Routes

- Line 51B: This line has not been altered Improvements will be identified in the upcoming Line 51 Transit Study

- Line NL/F/H/Z These lines would remain the same

Eliminated Routes

- Line 31 Line 31 currently goes from MacArthur BART to Hollis to West Oakland BART to Alameda, similar to the proposed West Oakland Streetcar Route This line would no longer serve the study area Other lines would serve parts of this route.

The Broadway Circulator Study

Planning efforts to replace the "Free B" Oakland shuttle with an enhanced bus or streetcar system are underway The planning effort is studying alternatives for different streetcar routes, including from Jack London Square to 27th Street ("Pill Hill") and possibly to MacArthur BART. This route provides connections between two major Downtown Oakland BART stations (12th Street Oakland City Center and 19th Street Oakland) via Broadway The objectives of this route are to enhance the current transit service, enhance the "Free B" shuttle line service quality and area, and support economic and community development along Broadway and within the MacArthur BART neighborhood Connections within this service include[4]

- Jack London Square

- Downtown/Uptown Oakland

- 27th Street ("Pill Hill")

- Upper Broadway and 51st Street

- Oakland Chinatown

- MacArthur BART neighborhood (possibly a later phase)

[4] Fehr and Peers (2013) Broadway Transit Urban Circulator Study, Draft Initial Evaluation of Alternatives, City of Oakland

Figure 2: Current AC Transit and Shuttle Routes

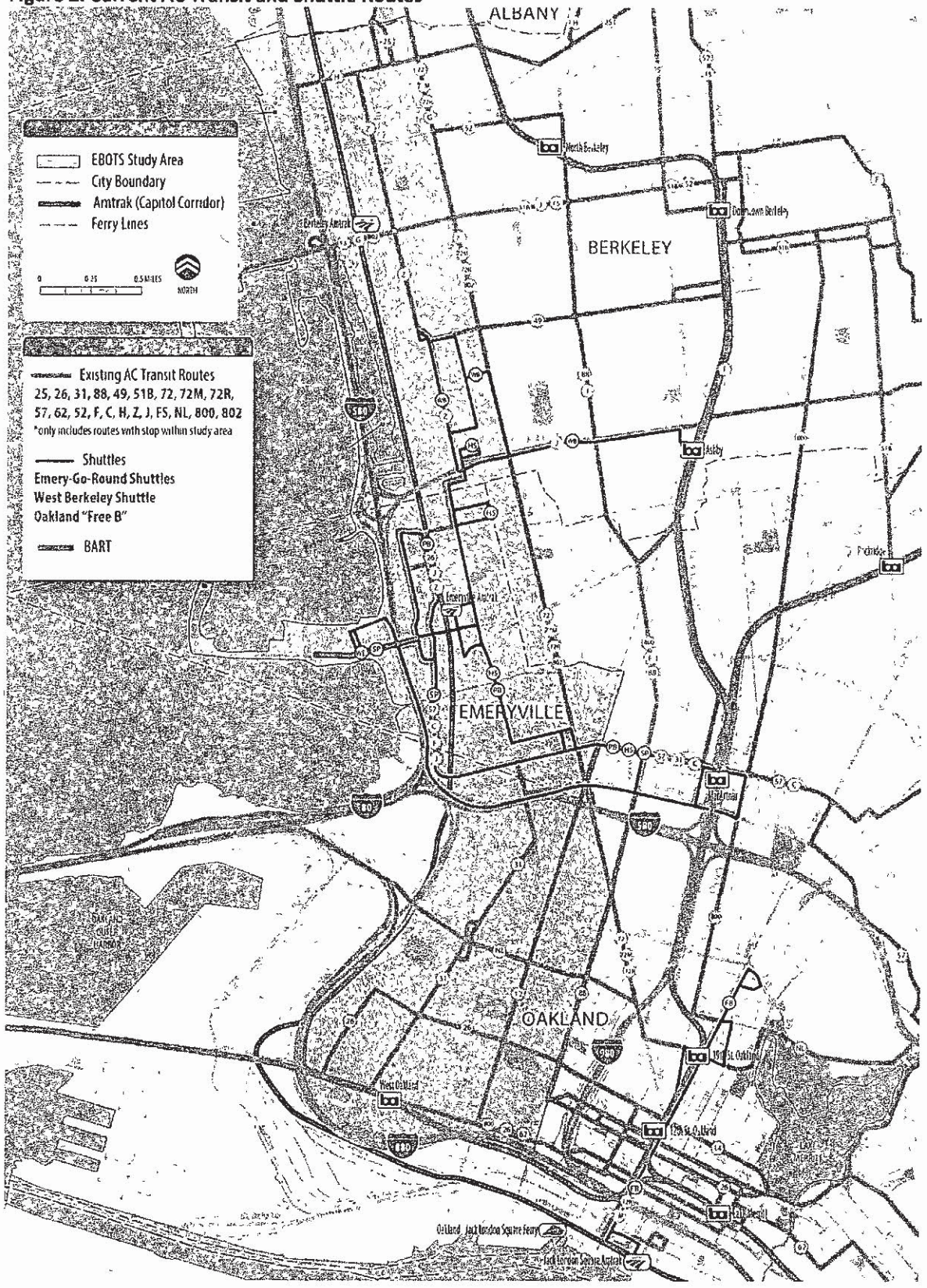
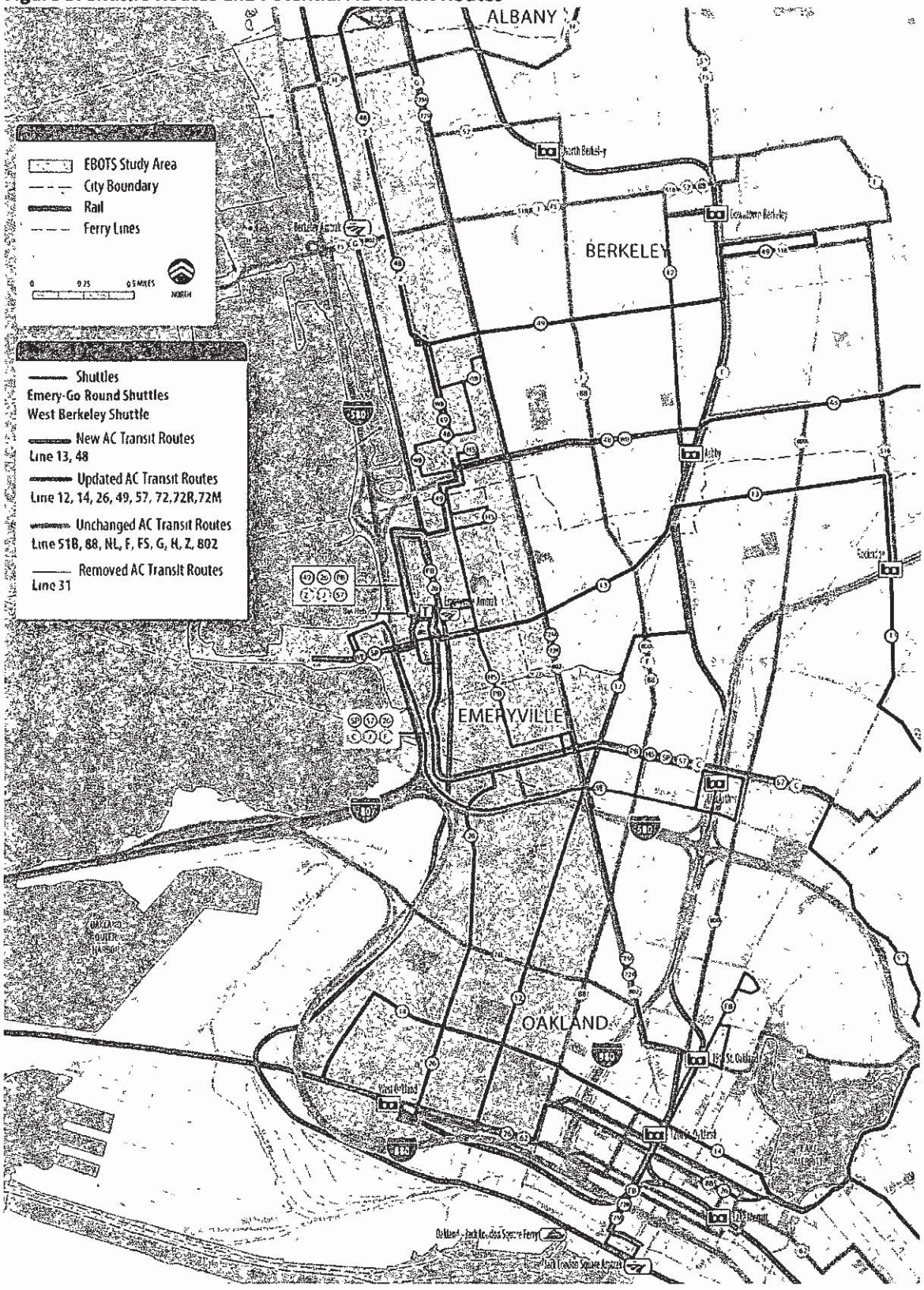


Figure 3: Shuttle Routes and Potential AC Transit Routes



4. Proposed Transit Improvements

The following proposed transit improvements have been assembled based on input received from the community meetings and from review and coordination with the TAC as well as the city councils in the three cities The improvements include the Trunkline Connector route and the Streetcar routes.

Short-Term Improvements (1 - 5 years)

Short-term improvements are focused on interim improvements that will help set the stage for the proposed Trunkline Connector and Streetcar routes described below as well as other near term improvements related to transit access

Modifications to Planned AC Transit Route Improvements

Planned AC Transit improvements were presented and discussed at community meetings and studied as part of the EBOTS planning process for improving transit in the study area While planned improvements based on AC Transit's Inner East Bay Comprehensive Operations Analysis (COA) are presented in Section 3 Transit Context, the below are recommendations are modifications those routes based on community input received during the workshops and through discussions with TAC members

- Line 48· Line 48 would connect northwest Berkeley to Ashby BART, Elmwood and Claremont in Berkeley via 6th, 7th and Ashby Proposed change from AC Transit COA recommendation would be to have line 48 travel north on 6th to extend into West Berkeley to Gilman and not connect to the Emeryville Public Market.

- Line 49. Line 49 would be altered to connect the Emeryville Public Market to portions of West Berkeley, Downtown Berkeley and UC Berkeley via Dwight. At Shattuck, the line would travel north, then loop on Durant, Telegraph and Bancroft to connect to the UC Berkeley Campus Proposed change from AC Transit COA recommendation is to go north on Shattuck and connect to UC Berkeley Campus on Bancroft and Durant.

- Line F· No changes were described for Line F in the COA, however, a modification to this route would be to have it stop at the future bus hub on Shellmound Street, near Shellmound Way Line F currently stops within a few hundred feet of where the new bus hub will be located and this will be an important connection to other transit routes.

Connection to the Berkeley Amtrak Station

Connection to the Amtrak Station in West Berkeley is currently provided by AC Transit Line 51B as well as one morning and one afternoon connection served by the West Berkeley Shuttle, an indicator of the limited north-south connections to the Berkeley Amtrak Station One possible solution is increasing the number of trips served by the West Berkeley Shuttle

Another possible improved connection to the Berkeley Amtrak Station is the new AC Transit Line 48 which will connect to the Ashby BART Station and pass near the Amtrak Station at 6th and University A possible modification of this route would be a short diversion to provide improved service to the Amtrak Station using Addison Street, 4th Street, and Hearst Avenue The drawback of this diversion is

retaining the continuity and consistency of a more direct route Regardless, even without the diversion Line 48 would provide a north-south connection within a ¼ mile of the Amtrak Station.

Connection to West Oakland Businesses

While the new AC Transit routes provide improved connections throughout West Oakland, there may be an opportunity to provide shuttle service from West Oakland BART that more closely serves businesses near West Grand Avenue and at the former Army Base Additionally, an early version of Gateway Park proposal included the idea of potential shuttle routes connecting area residents to the new park at the base of the Bay Bridge. Further study should consider a shuttle service to provide access to businesses and open space in West Oakland

Improved Bus Stops in Emeryville

Two locations in Emeryville have capacity and need for improved bus stop infrastructure and amenities. One is that the City of Emeryville is currently seeking funding for a widening of on- and off-ramps at the I-80 interchange and Powell Avenue As part of this improvement there would be room for an additional bus stop for AC Transit Transbay service on Powell Street West of the overpass

San Pablo Avenue and 40th Street offers another location where there is an opportunity for significant improvements to bus stops Several buses currently stop at this intersection, including the Emery Go-round Shellmound-Powell line and AC Transit lines 26, 31, 57, 72, 72M, 72R, 802, C and F. This location could accommodate improved bus stops including shelters, real-time arrival displays and improved informational and wayfinding signage

Transit Passes

The desire for incorporating AC Transit Easy Pass purchases into new residential and commercial developments was stated several times at community meetings as a possible way to encourage increased transit use The Easy Pass program costs a fraction of cost per user—between $4 and $10 per month for unlimited rides depending on the group size purchasing passes Cities can work with new and existing developments to encourage use of the Easy Pass program. There are additional opportunities to provide incentives for participation, such as reduced parking requirements or density bonuses

Study Demand-Responsive Transit

New technologies in ridesharing, on-demand cab service, and interactive demand-responsive transit vehicles may become a more viable means of bridging the gap between major transit hubs and local destinations Historically, demand-responsive transit systems, such as dial-a-ride, have been utilized only in low-density locations However, some for-profit demand-responsive transit services are beginning to locate in high-density areas. For example a startup called Bridj connects Boston's inner suburbs to downtown and riders can schedule a pick-up at designated locations. While this is not door-to-door service it does provide a level of flexibility for users not seen by typical bus service Regarding costs, however, Bridj charges about $6 for a 4 5 mile ride, which is more than three times the cost of regular transit in the area [5]

Vehicle capacity and cost per passenger remain the largest barriers to incorporating demand-responsive transit services Ridership of highly utilized demand-responsive transit top out at approximately 10 riders

[5] Seelye, K Q (June 4, 2014) To Lure Bostonians, New 'Pop-Up' Bus Service Learns Riders' Rhythms *New York Times*

per vehicle-hour [6] Furthermore, because operational costs and salary of drivers for transit vehicles is a significant factor, limited vehicle capacity relates to higher operational costs to meet the needs of high-density areas. This indicates that demand-responsive transit may be a feasible solution for late night coverage when transit is less available and demand is reduced, but would be costly for regular service and would add VMT to the network

A feasibility study looking at how demand-responsive transit may supplement public transit and utilize new technology could be considered for cities and/or transit providers within the EBOTS study area

EBOTS Trunkline Connector Route (5 – 10 Years)

The Trunkline Connector Service Concept is proposed to connect West Oakland, Emeryville, and West Berkeley in the 5 – 10 year timeframe This concept was developed in response to input that many locations are currently difficult to access using transit in the study area, including Gilman Street in Berkeley, West Oakland BART station, Berkeley Bowl West and other grocery stores, the Fourth Street commercial area in Berkeley, Jack London Square, and waterfront areas The line is 8 1 miles in length and would take approximately 41 minutes to traverse in one direction of travel (including service stops), assuming an average speed of 12 mph [7] **Figure 4** shows the proposed Trunkline Connector Route The following identifies the key characteristics of this service

[6] Potts, J F , M A Marshall, E C Crockett, J Washington (2010) *TCRP Report 140 A Guide for Planning and Operating Flexible Public Transportation Services* Washington DC Transportation Research Board, National Research council

[7] AC Transit's average bus speed is 11mph (http://www.actransit.org/customer/transit-glossary/) TCRP Synthesis 110 – Common Approaches for Improving Transit Bus Speeds states average speeds of transit systems ranging from 8 1 to 16 3, with an average of 13 5 (lower for larger systems) However, many improvements in the proposed system have increased speeds in urban bus systems significantly (TCRP Synthesis 110)

1. **Connect to key locations in West Oakland, Emeryville and West Berkeley**

   - The Trunkline Connector is designed as a north-south route linking all three cities It connects residential areas in West Oakland with activity centers like Jack London Square, the West Oakland BART station, the East Bay Bridge shopping center, the retail commercial opportunities along Shellmound Street, and West Berkeley. The line would provide bi-directional service between Jack London Square and Gilman and San Pablo Avenue via 3rd, Mandela, 40th, Hollis, 7th, 6th, and Gilman.

     - It is important to note that an alternate northern terminus to Downtown Berkeley was also discussed instead of going to Gilman Street However, this alternate route is not shown because it would overlap with AC Transit Route 51B and the connection between Downtown Berkeley and Emeryville will be served by AC Transit's planned Route 49. Regardless, as the trunkline connector is studied in the future, this alternate northern terminus may also be considered.

   - The Connector provides better connections to the West Oakland BART station and other major destinations. The route would connect several transportation hubs—the Jack London Square Ferry terminal, the West Oakland BART station, the Emeryville Amtrak, and the Berkeley Amtrak

2. **Improve service**

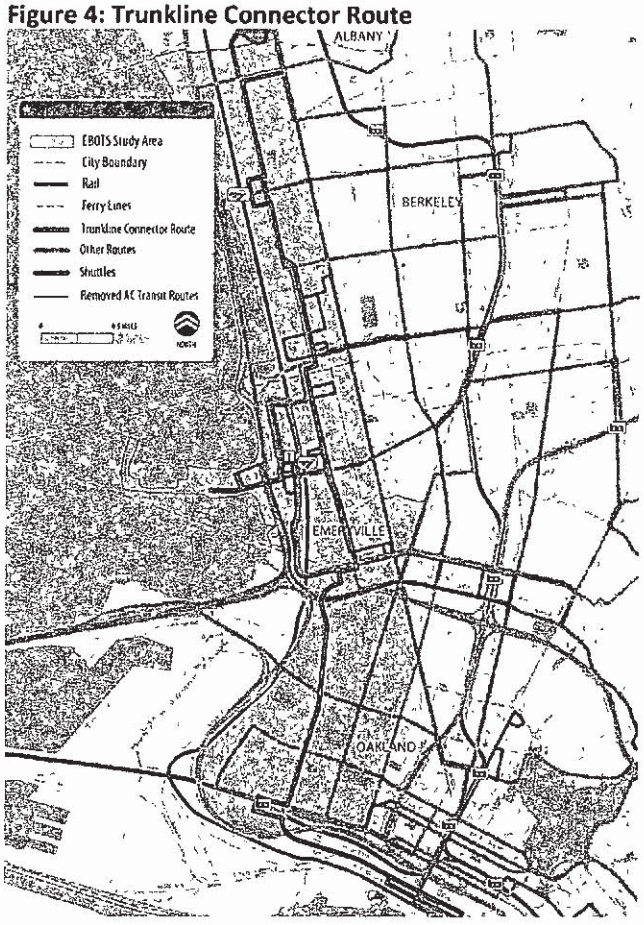
   - The service would provide frequent service within peak hours as well off-peak daytime hours, evening and weekends Service would operate every day, from 6 00 am to 10 00 pm Monday through Friday and from 7 00 am to 11 00 pm Saturday and Sunday

   - Service would be offered at 10 minute intervals daily, with the exception of less frequent (15 minutes interval) service in the early or late hours of each day. Stop spacing would be approximately every 0 2 miles, increasing speeds relative to many comparative routes in the area with more frequent stop spacing

3. **Improve amenities**

   - The service would be operated using a branded hybrid or battery bus and includes (1) marketing, (2) speed enhancing features such as curb

Figure 4: Trunkline Connector Route



extensions, low floors with aisles for faster boarding, and signal priority, and (3) updated bus stops with shelters, lighting, cameras, real-time arrival information, benches, trash bins and bike racks

These improvements respond directly to the input received from the community workshops by focusing on connectivity to key locations in West Oakland, Emeryville and West Berkeley, increasing the quality of service such as frequency and speeds, and transit amenities such as real-time information, vehicle improvements, and faster boarding.

EBOTS Streetcar Routes (10 – 20 Years)

The timeline of the proposed Streetcar routes is 10 – 20 years The routes consist of two lines—the West Oakland and Emeryville lines—designed with the Broadway Circulator in mind, expanding this service to connect to West Oakland and Emeryville. There is the need to better tie in MacArthur BART and Jack London Square to West Oakland and Emeryville commercial areas. Two separate lines were developed, but each would serve a mutually exclusive section of the study area (with the exception of some duplication on 40th Street, which allows for increased service in that high demand area).

The West Oakland line is 4 3 miles in length and would take approximately 22 minutes to traverse in one direction of travel (including service stops), assuming an average speed of 12 mph [8] The Emeryville line is 5 3 miles in length and would take approximately 27 minutes to traverse in one direction of travel (including service stops), assuming an average speed of 12 mph The following identifies the key characteristics of the two Streetcar routes.

- **Connect to key locations in West Oakland and Emeryville**
  - The Streetcar route connects the Jack London Square area, West Oakland, Amtrak, and MacArthur BART with the East Bay Bridge shopping areas and the medical complexes in the Mid-Broadway area in Oakland From its southern terminal at the Oakland Jack London Square Amtrak Station, the system would operate on the 2nd/3rd couplet and 3rd Street to the West Oakland BART Station, where it would circulate around the station, continuing north on Mandela, then Hollis, 40th to the MacArthur BART Station.
  - The route would connect West Oakland along Mandela with major transit terminals The Emeryville Streetcar Route is designed to connect MacArthur BART Station with the employment and shopping areas along Hollis and West Berkeley via 40th, Hollis, Powell, Shellmound and Christie.
- **Improve service**
  - The service would provide frequent service within peak hours as well off-peak daytime hours, evening and weekends. Service would operate every day from 6:00 or 7:00 am (depending on day of week) to 10 00 or 11:00 pm.

[8] Streetcar systems typically have similar speeds as buses, varying widely depending on operator, line, and location Average speeds for the Portland Streetcar are approximately 15mph (http //www nycsubway org/wiki/Portland_Streetcar) However, because sources vary and system speeds are more dependent on location, average speeds were based on AC Transit bus service average speeds with slight speed increases due to service improvements

- The new line would coordinate with other transit services. Much of the Emeryville line is currently operated as part of the Emery Go-Round Shellmound-Powell shuttle bus route Adjustments to that service in coordination with the introduction of the proposed route will be important in order to provide complementary and efficient transit service

- **Improve amenities**

  - The service is designed to have bulb-outs and level boarding to improve service efficiency and increase travel speed

  - Stop amenities for the Streetcar concept include well-lit shelters with real-time arrival information Marketing and clear route information will help make the streetcar a visible and accessible transit option

- **Improve economic vitality and community development**

  - Due to the visibility of the streetcar mode, routes and service are generally more legible and understood relative to other transit modes The service investment and visibility has shown to increase economic development and support walkable, transit-oriented development in cities that have recently implemented modern streetcar systems

Figure 5 shows a simplified image focusing on the streetcar routes without distinguishing other transit lines **Figure 6** shows detail of the streetcar routes including the enhanced AC Transit bus routes, Trunkline connector, and the Streetcar routes that are proposed for the 10 – 20 year timeframe

Figure 5: Proposed Streetcar Routes

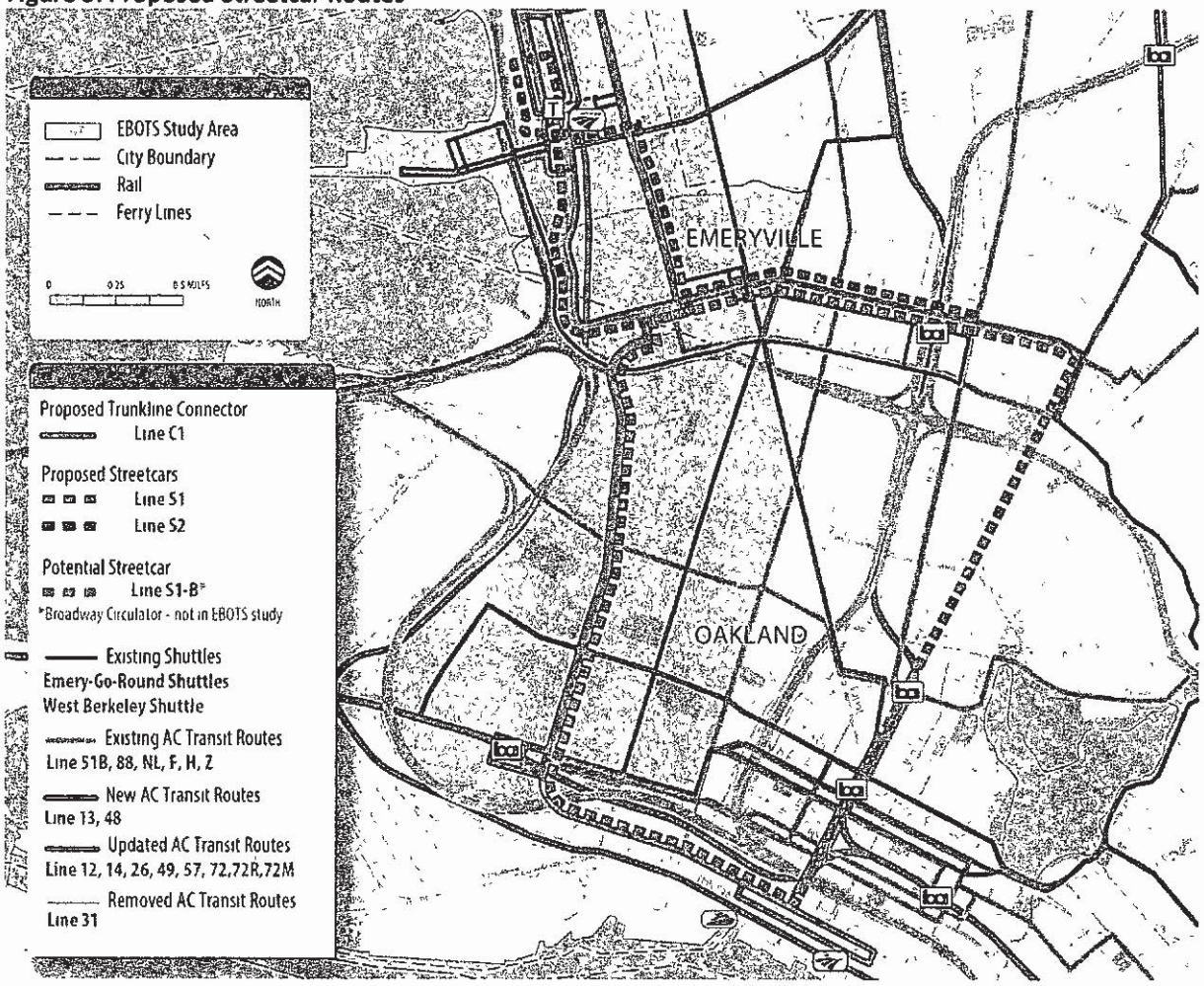
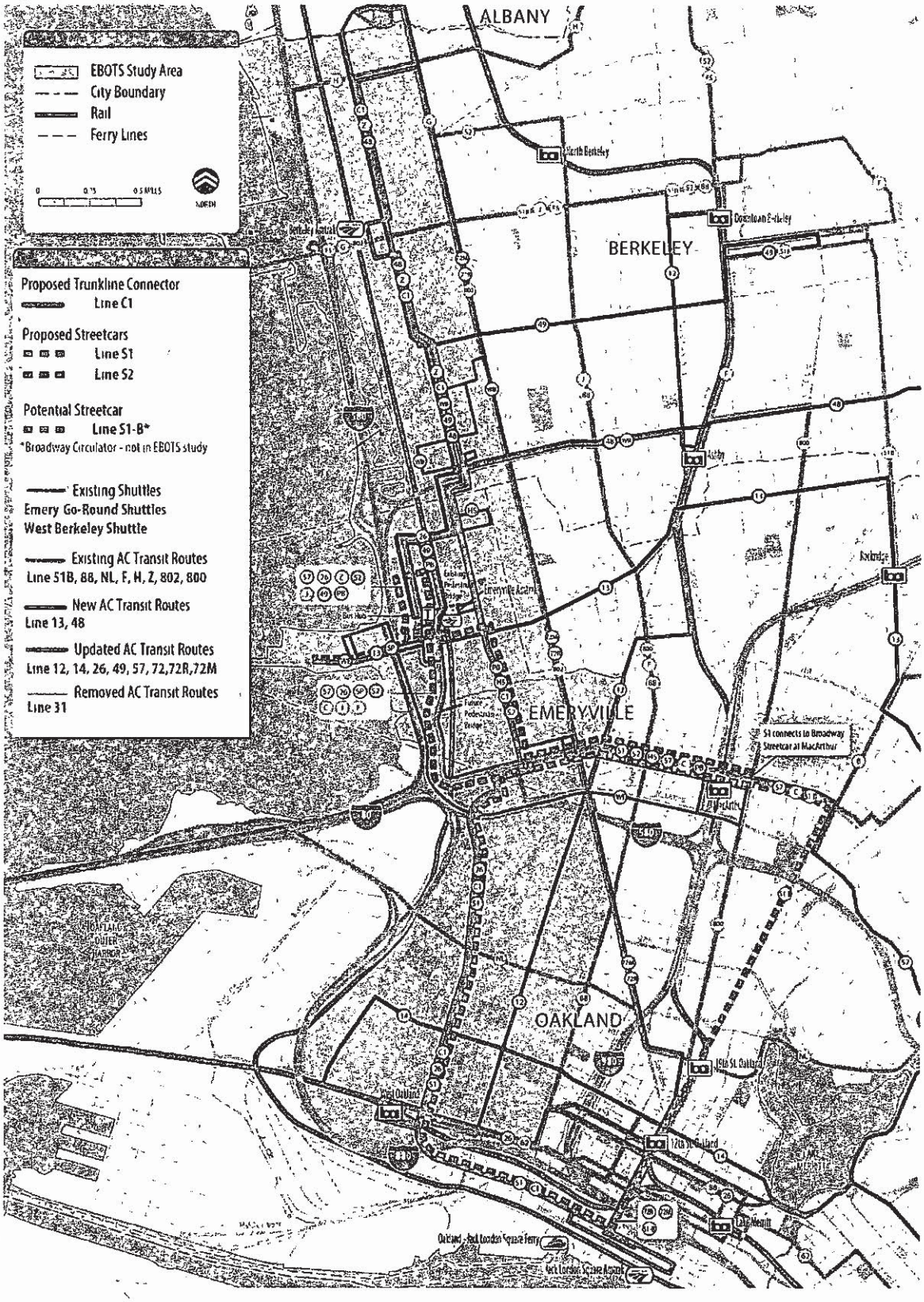


Figure 6: Proposed Trunkline Connector and Streetcar Routes



5. Evaluation of Improvements

This section provides an evaluation of the Trunkline Connector Route and Streetcar Routes Many evaluations are completed at a "sketch" level consistent with the evaluation stage of the proposed routes The evaluation of transit options included the following evaluation factors.

- Ridership
- Vehicle Miles Traveled (VMT) Analysis
- Effects on Environmental Justice Communities
- Safety and Security
- Costs
- Compatibility with Existing Transit
- Economic Development Impact

Ridership

Ridership forecasts were based on comparative system data, including AC Transit and urban transit systems as reported in the National Transit Database Average per-stop ridership for comparative AC Transit route segments that run within ¼ mile of the proposed route were used to approximate location-specific transit demand [9] The average number of riders per stop per day for comparative routes ranged from about 31-39 riders An elasticity factor was applied to the average per-stop ridership to account for increases in service frequency and mode changes in the improved routes This enhanced per-stop ridership average was then used to calculate the route ridership by multiplying the average per-stop ridership by the approximate number of total stops per proposed route. Numbers are rounded to the nearest 100. **Table 2** lists the total riders and new ridership projections for the proposed routes

- **Enhanced bus service:** Enhanced service applies an elasticity that accounts for frequency of service increases. While only included in the upper range, ridership would be expected to increase further for additional enhancements such as branding/marketing, low floor busses for faster boarding, and Intelligent Transportation System (ITS) applications such as real-time travel information and signal priority Literature states that marketing alone can increase ridership up to 10%; the combination of marketing and passenger information can increase ridership as much as 20%.[10] For the Trunkline Connector and Streetcar routes, the upper range estimates includes an elasticity factor to account for such variations

- **Streetcar ridership** An additional elasticity factor was applied to account for increased demand generated by streetcar systems relative to bus transit Within three comparative systems

[9] Routes without overlap in transit demand, such as routes running perpendicular, overnight routes or transbay routes with less than 2 stops in the project area, were not included

[10] Federal Transit Administration Bus Rapid Transit Practitioner's Guide TCRP Report 118, Currie, Graham and Wallis, Ian (2008) "Effective Ways to Grow Urban Bus markets – A Synthesis of Evidence "

analyzed,[11] it was found that streetcar systems typically have approximately 20%-80% more ridership compared to bus systems in the same area. An average estimated ridership increase of 46% was applied to the proposed streetcar routes

- **Population projection:** The increase in ridership for all modes is assumed to increase proportionally to the projected population and job increase in the project area (based on ABAG Travel Analysis Zone projection). In reality, increases in population and job growth will also lead to increases in land use intensity, which will encourage more public transit use, making the lower-range estimated ridership increase by 2020 and 2035 conservative measures For the Trunkline Connector and Streetcar Routes, the upper range ridership estimates includes an elasticity factor to account for variations in design as well as increased ridership

- **Transferred Ridership:** The total ridership for comparative stops adjacent to proposed routes was distributed across the additional proposed stops (based on route stop-spacing) to estimate the number of "transferred riders," or those who would transfer from one bus line to the new route line

- **New Ridership:** New ridership includes only those riders generated from service improvements, while the remainder of the ridership includes those who transfer from other routes. This is calculated by taking the total ridership and subtracting the "transferred ridership" for each route

Table 2: Transit Improvements – Daily Ridership Forecast

Improvement	Daily Weekday Ridership	
	Total Riders	New Riders
Trunkline Connector Route 2020 Forecast		
Trunkline Connector Route *Jack London Square to North Berkeley*	**5,800 – 7,300**	3,800 – 5,300
Streetcar Routes 2035 Forecast		
West Oakland Streetcar Route *Jack London Square to MacArthur BART through West Oakland*	**4,200 – 5,300**	3,100 – 4,200
Emeryville Streetcar Route *MacArthur BART to Emeryville's Shellmound Street*	**5,700 – 7,100**	4,900 – 6,300

[11] Seattle's King County with 82% more, New Orleans with 19% more, and Memphis streetcar system with 37% more Portland's streetcar has 172% more ridership, but was deemed not comparable because of the much larger extent of the regional Tri-Met bus system

Vehicle Miles Traveled (VMT) Analysis

Vehicle Miles Traveled (VMT) is assumed to be directly related to increases in new ridership, and the vehicle miles per day traveled by each route VMT was calculated from the new riders, or the ridership that is not generated from passengers who transferred to another bus or shuttle route Baseline VMT was calculated based on new riders transferring from a previous mode, including drive alone, carpooling/other, and walk/bicycle modes Newly added VMT was calculated by using the total vehicle-miles each route will cover The difference between the baseline VMT for all new riders and the VMT for each route is the calculated VMT changes, which includes additional VMT from new riders switching from vehicle modes (VMT savings) and walk/bike modes (VMT additions) to transit. Ranges are based on the assumption that average trip length for riders is between 2 5 and 3 miles long. The percentage mode share was assumed to be consistent with journey-to-work data from the American Community Survey (2012), for U S Census tracks within the project area **Table 3** lists the estimated VMT that the proposed route will create as well as the reduction in VMT that is caused by new riders shifting from non-transit modes to transit modes.

Table 3: Daily VMT Reduction by Route

Alternative	Daily Weekday VMT	
	Total VMT for Route	VMT Reduction
Trunkline Connector, 2020 Forecast		
Trunkline Connector Route *Jack London Square to North Berkeley*	2,700 miles	**4,700 – 6,200 miles**
Streetcar Routes, 2035 Forecast West Oakland		
West Oakland Streetcar Route *Jack London Square to MacArthur BART through West Oakland*	800 miles	**5,300 – 6,500 miles**
Emeryville Streetcar Route *MacArthur BART to Emeryville's Shellmound Street*	1,300 miles	**8,300 – 10,200 miles**

Effects on Environmental Justice Communities

This section provides an analysis of effects on minority and low-income community within the study area. While this impact overview does not obviate the need for further Title VI[12] analyses prior to service improvements, nor does it replace the need for environmental clearance, it does provide an overview of potential effects on protected populations

The primary evaluation factor for this analysis includes transit access within a 1/4mile of transit routes within the study area. Each set of improvements was evaluated and compared with existing transit service to compare access to transit Additional considerations include construction impacts, gentrification and reduced Sales leakage

Low-Income and Minority Communities

For purposes of determining minority and low-income concentrations within the EBOTS study area, the following definitions were used.

- "Minority" populations include any non-white individuals or households (including Hispanic or Latino populations, regardless of race),
- "Low-income" populations include households making less than 200% of the federal poverty rate, which is currently at $23,550 for a family of four. This means that households with incomes under $47,100 for a family of four would be considered low-income.

The EBOTS study area is racially diverse with 73% of the population is minority, with the highest concentrations located in West Oakland where some census tracts are greater than 80% minority. Other significant concentrations of minority populations occur in Emeryville, where census tracts are between 60% and 80% minority (excluding the area bounded by 53rd Street and 67th Street, and Shellmound and Vallejo which is approximately 40% to 60%) and in West Berkeley from Dwight Way to Camelia Street However, concentrations of minority populations still range from 40% to 60% in the remaining tracts within the study area In fact, no census tracts within the study area are less than 40% minority. Since there are no tracts where the ethnicity is below 40% in the study area, the function of this qualitative analysis will be to provide a highlight of where specific service alternatives may provide a higher or lower level of access for minority populations. **Table 4**, below, presents the percentages of minority and low income populations within the EBOTS study area **Figure 7** presents a map depicting the concentrations of Minority populations in the study area

A review of the low-income populations reveals a slightly different picture from the patterns of minority concentrations Approximately 44% of households in the EBOTS study area would be classified as low-income using the definition of households earning less than 200% of the federal poverty level However, only one area, West Oakland, has significant populations of low income households In the census block group bounded by Grand and 5th Street, and Adeline and Mandela Parkway, between 70% and 80% of the households fall within the definition of low-income. The second greatest concentration of low-income households is immediately adjacent, bounded by Grant and 5th Street, and Adeline and Market

[12] Title VI of the Civil Rights Act of 1964 protects people from discrimination based on race, color or national origin, specifically in programs/activities that are federally funded Source www fta dot gov

Street This area has concentrations of 60% and 70% of low income **Figure 7** presents a map depicting the concentrations of Low-Income populations in the study area.

Table 4 shows the overall minority and low-income population by percentage in the study area.

Table 4: Minority and Low Income Populations in the EBOTS Study Area

Scenario and Routes	% Minority	% Non-Minority	% Low-Income	% Non-Low-Income
EBOTS Study Area	73 0%	27.0%	44 4%	55.6%

Access to Transit

Nearly all areas within the Study area are within a ¼-mile of transit, including areas within low-income and minority areas Since widespread service is being provided by existing transit service (including shuttle services), little change will occur in the numbers of low-income and minority populations served by transit However, the intensity and quality of service will be improved with the potential transit improvements. **Table 5** shows the percent minority and the percent low income residing within ¼ mile of each route **Figure 7** and **Figure 8** show the density of minority and low-income residents within the study area

Table 5: Minority and Low-Income within 1/4 mile of routes

Scenario and Routes	% Minority	% Low-Income
Existing Transit Routes within the Study Area (1/4-Mile Buffer)	71.95%	43.11%
Planned Transit Routes within the Study Area , including AC Transit and Emery Go-round improvements described in Section 3 (1/4-Mile Buffer)	71.88%	43.01%
EBOTS Transit Improvements • Trunkline Connector Route • Streetcar Routes	71.88%	43 01%

*Notes Includes routes with 30 minutes or less peak frequency Does not include communities outside of the study area Because Trunkline Connector and Streetcar route improvements include the AC Transit Updated Bus Routes (covering most of the study area), the percent minority and low-income populations within ¼ mile of routes does not change

The buffer analysis of the AC Transit updates and the proposed routes identified approximately 71 88% of the population within the ¼ mile buffer as minority, which is slightly lower than the overall minority percentage within the EBOTS study area and slightly lower compared with Existing service However, improvements to service and reliability would offset this modest difference and improved transit service would benefit all users, especially in West Oakland where several key improvements are identified

Potential Construction impacts

The construction impacts due to the potential transit improvements are minimal. Construction of streetcar routes would not likely result in any displacements of commercial or residential buildings and construction would not likely occur for longer than 18 months and would be phased in segments to

minimize disruption to the community including limited road closures and detours. Construction of a streetcar may result in impacts related to noise, dust and detours during construction. These impacts could be mitigated with appropriate best management practices and outreach to the community

Benefits for Low-Income and Minority Communities

Benefits to low-income and minority communities could include improved access appropriate educational and employment opportunities and attraction of retail and services that would reduce sales leakage out of the area

Figure 7: EBOTS Study Area Minority Populations

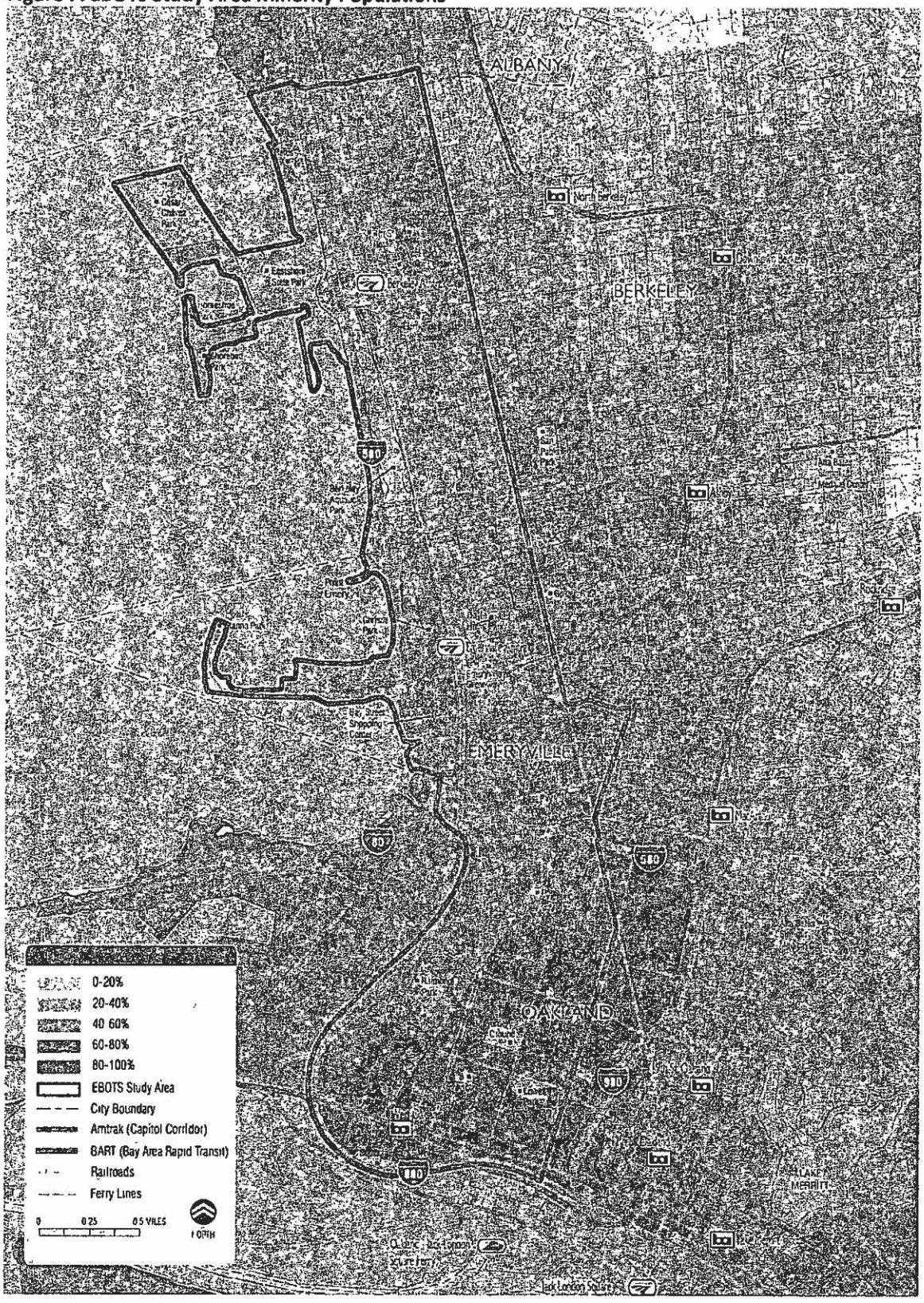


Figure 8: EBOTS Study Area Low-Income Populations

Safety and Security

Safety and security for transit riders, pedestrians, bicyclists, and other vehicles is a concern with the addition of a new transit line or system. At community meetings and in the surveys community members expressed feeling unsafe when waiting at bus stops and occasionally when riding the bus Furthermore, participants raised several concerns for street crossings and pedestrian safety. Based on these concerns, safety and security issues addressed here include

- Security concerns at transit stops and facilities.
- Safety concerns related to increased collisions and multimodal conflicts.
- Additional safety concerns related to streetcars and streetcar tracks

Further analysis of specific sites can help identify areas for mitigation by specific site design to prevent adverse safety impacts. A detailed safety plan could be developed to establish the standards and design, construction, and commissioning of a system's safety elements

Bus Stops and Facilities

There are several safety concerns for bus amenities, typically amenities increase the efficiency and safety of passengers Facilities to enhance safety should have good visibility, lighting, grade separation, and clear demarcation of pedestrian and vehicle areas [13] However, the full extent of a safety analysis depends on several site-specific factors Landscaping, signage, and other facilities can enhance safety by providing benefits such as lighting and visibility However, amenities can sometimes cause visual or physical obstructions to vehicles Site-specific analysis of future stops will need to be conducted in order to fully analyze the safety and security of amenities.

For example, bulb outs can have both positive and negative safety effects Bulb outs can improve safety by reducing the need for buses to re-enter traffic flow after stopping and improve access and increase space for boarding and alighting passengers They can also potentially decrease pedestrian-vehicle conflicts by making pedestrians more visible to approaching traffic Bulb outs can potentially have negative impacts on bike safety as they may be causing breaks in continuous bike lanes, which could lead to increased conflicts [14] Bus stops will have lights and cameras for security

Intermodal Collisions

Any increase in transit service increases chances for intermodal (including pedestrian, bicyclist, and other vehicles) conflicts The impact of the proposed routes on the safety of the corridor is site specific and depends on the design guidelines of the system as well as the site-specific travel characteristics and design of the streets For example, bus idling and visual obstructions can cause problems for all modes. When idling at intersections, buses can be a visual obstruction limiting drivers' view of pedestrians at crosswalks Rear-end collisions and accidents from vehicles quickly changing lanes are a large concern with increased transit due to events where buses make abrupt stops within a shared lane to pick up passengers.

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[13] Accessing Transit – Design Handbook for Florida Bus Passenger Facilities
[14] Oakland Bus Bulbs Analysis – AC Transit East Bay Bus Rapid Transit Project in Alameda County

Streetcars

One of the most common streetcar concerns is that the streetcar tracks provide a hazard for bicycle wheels Bicycle wheels can get stuck in the track ruts, causing injuries from falls and collisions. Some safety and security concerns unique to streetcars include

- Bicyclists wheels can get stuck or slip on tracks
- Streetcar vehicles cannot change directions to respond to a vehicle conflict
- Streetcars within travel lanes will increase traffic congestion, causing increased conflicts

Costs

All costs were evaluated based on costs of similar systems and guidelines provided by AC Transit Note that these costs are estimates and actual costs vary widely depending on the specifics of the service and route. Moreover, if routes are operated by a non-profit or under private contract, costs would likely be lower, yet drivers may not be as well compensated. Because of the broad nature of the estimates, all numbers are rounded to the nearest million dollars.

Trunkline Connector Route Costs

Capital Costs for the Trunkline Connector Route are based on the route mileage as well as the number of total vehicles needed Capital costs were estimated with a range starting at $270,000 per mile in each direction for a total of 16 2 miles as well as $700,000 per vehicle Per-mile costs (not including vehicles) are based on the San Pablo Avenue BRT (2005) and the Wilshire Ventura Blvd Metro Rapid System (2000) and inflated to 2014 dollars [15] These costs include stops (accommodating approximately 5 stops per mile) and amenities such as bus arrival information, street furniture, marketing costs, and intersection signal priority costs. Vehicle costs were estimated at $700,000, an estimate based on comparative new 40-foot and 60-foot hybrid vehicle purchases [16] To account for variations in costs for different types of system vehicles and operators, a range was created based on an additional 15% contingency rate With these assumptions, capital costs total $11 – 12 million Based on a 12-year infrastructure lifecycle,[17] annualized capital costs would be approximately $1 million/year

- Capital Costs· $11 – 12 million
- Annualized Capital Costs. $1 million/year

The operating and maintenance costs for the Connector Route is based on an estimated number of annual revenue hours, calculated based on route length, peak and off-peak headways, and estimated layover times According to data reported by the National Transit Database (NTD) in 2010, typical operational and maintenance costs for bus services around the country range from approximately $100/hour to $168/hour (while AC Transit's fully allocated costs are $168/hour) The estimate used was $160/hour with a range based on an additional 15% contingency rate to account for variations due to system specifics

- Operating and Maintenance Costs $11 – 13 million per year

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[15] The San Pablo Avenue BRT study's (2005) costs for traffic, stop improvements and amenities, ridership surveys, marketing and amenity operations was approximately $3 2 million for 26 stops and 14 miles (National Bus Rapid Transit Institute, The San Pablo Rapid BRT Project Evaluation Final Report, 2006) In 2014 dollars, this per-mile cost equals about $270,000 The Wilshire and Ventura Blvd Metro Rapid System (2000) cost approximately $8 2 million for 42 miles for stops and intersection signal priority (Final Report, Los Angeles Metro Rapid Demonstration Program, 2002) In 2014 dollars, this per-mile cost also equals about $270,000

[16] This estimate is based on several system costs, including a 2012 purchase of 60-foot articulated hybrid-electric buses at $813,100 for CTTRANSIT Hartford (cttransit com), 40-foot hybrid bus costs of about $500,000 by King County metro Transit (kingcounty gov, 2013), and San Francisco new Flyer hybrid bus costs of $752,000 per vehicle in 2013 This value is also consistent with estimates made for Oakland in the Broadway Transit Urban Circulator Study (2013)

[17] U S Department of Transportation Federal Transit Administration (FTA) Useful Life of Transit Buses and Vans Report No FTA VA-26-7229-07 1

Streetcar Route Costs

The capital costs for the Streetcar Routes were calculated based on the Seattle streetcar system capital costs ($27.6 million per track-mile in 2014 dollars) and rounded to a rate of $30 million.[18] To account for variations in costs for different types of systems, an upper range value was created based on an additional 15% contingency rate With these assumptions, capital costs total $129 - $148 million for both lines Based on a 30-year infrastructure lifecycle, annualized capital costs would be $10 – 11 million/year [19]

- Total Capital Costs $228 - $331 million
    a West Oakland Route $129 - $148 million
    b. Emeryville Route. $159 - $183 million
- Annualized Capital Costs $10 – 11 million/year
    a. West Oakland Route. $4 - $5 million/year
    b Emeryville Route $5 - $6 million/year

Like the operating costs for the Trunkline Connector Route system, operating and maintenance costs for the Streetcar routes was calculated based on the headway times and total route distance in order to calculate the total operating hours Streetcar operating and maintenance costs were assumed to be 60% higher than bus service based on findings from the NTD where typical streetcar costs are 40 - 60% higher for comparable modern streetcar systems. This total cost was $270 per hour with an upper range created using an additional 15% contingency rate to account for variations

- Total Operational and Maintenance Costs $13 - $15 million/year
    a West Oakland Route $5 - $6 million/year
    b Emeryville Route $8 - $9 million/year

[18] Seattle Streetcar capital costs were $56 4 million for 2 5 miles of track ($22 6 million per track-mile, or $27 6 million per track-mile in 2014 dollars) The Seattle Streetcar systems was constructed from 2005-2007 An additional 25% inflation rate was added to account for increasingly high costs of construction in the Bay Area

[19] Based on an assumption that Streetcar vehicles last approximately 30-40 years From Pittsburg City Planning, Strip District Transportation and Land Use Plan Best Practices – Streetcar Capital Cost Estimate – City of Pittsburg Alternative source, streetcar lifecycle of approximately 30 year City of Seattle, Section 10 Asset Class - Seattle Streetcars Report

Compatibility with Existing Transit

When new transit service begins in the EBOTS study area it would likely supplement existing transit service The proposed Trunkline Connector and Streetcar routes provide redundant service along Mandela Parkway and 40th Street, yet connect different key locations. These routes also provide service alongside AC Transit's potential realignments of Route 26 and Route 57 The relative service frequency and redundancy of these routes should be considered along with phasing and future demand needs Furthermore, consideration of how and where Emery Go-Round will operate is an important consideration, especially with the Emeryville Streetcar Route, which has segments similar to the Shellmound and Powell Bridge Emery Go-Round routes **Table 6** lists factors contributing to each route's compatibility with existing transit

Table 6: Compatibility with Existing Transit

Service	Compatibility with Existing Transit
Trunkline Connector Route	• Emery Go-Round: There would be minimal overlapping service along Hollis Street. • AC Transit: Service would overlap with AC Transit's proposed Line 26 within West Oakland, yet this Route would still provide a more direct connection from the West Oakland BART station to Shellmound. Service would also overlap with AC Transit's proposed Transbay Line Z along 6th Street in West Berkeley. Line 48 would overlap service between Ashby and Gilman along 7th and 6th streets
Streetcar Routes	Emeryville Streetcar Route • AC Transit: Streetcar service from MacArthur to Shellmound would overlap with AC Transit's proposed line 57. Line 57 could be redundant. • Emery Go-Round: There would be overlapping service connecting BART to locations currently served by the Hollis Emery Go-Round route and the Powell Bridge Emery Go-Round route. West Oakland Streetcar Route • AC Transit. Streetcar service on Mandela would overlap with the Trunkline Connector Route as well as AC Transit's proposed Line 26 However, West Oakland Streetcar Route would continue to MacArthur BART station and Line 26 would serve Shellmound. • Emery Go-Round: There would be minimal overlapping service with this route.

Economic Development Impact

Economic Development Potential

Each of the EBOTS cities has a significant existing employment base, Emeryville has the largest, followed by West Berkeley and West Oakland The existing residential population is considerably smaller, resulting in these areas having a very high ratio of jobs to employed residents when compared to the EBOTS cities overall.[20] West Oakland has the largest number of residents, followed by Emeryville and West Berkeley For all three EBOTS cities, fewer than 500 residents live and work in the same city within the study area; this results in substantial in-commuting because of the large employment base, combined with substantial out-commuting by EBOTS residents to jobs located in other places

Each of the EBOTS cities envisions substantial economic development over the next 20 years, to 2035, encompassing a range of new jobs, commercial development, and residential development West Oakland, through the recently adopted West Oakland Specific Plan, envisions the largest amount of new development as it seeks to preserve its existing economic base and current population, while attracting significant new industrial, Research and Development (R&D), office, retail, and mixed-use development alongside new residential land uses Emeryville, with the most active current real estate market of the three EBOTS cities, will continue to add a variety of new employment supporting R&D and office uses, and will approach build-out for residential uses. West Berkeley, pursuant to the provisions of the West Berkeley Plan, will see the lowest increase of the three cities in new employment and residential uses, with most activities likely focused on opportunities sited in the M-zoned District west of 6th and 7th Streets All three EBOTS cities seek to promote commercial and mixed-use development, with multifamily residential, at densities that are supportive of transit

A comparison of existing conditions and future project development is shown in **Table 7** below Growth projections are based on Plan Bay Area figures, using travel analysis zones (TAZ's) that approximately correspond to the EBOTS study area. An exception is West Berkeley where the EIR for Measure T, No Project Alternative, was used to reflect existing entitlements and the lesser amount of development that is allowed (the West Oakland figures exclude the former Oakland Army Base and other areas that are included in the West Oakland Specific Plan)

Table 7: Projected Employment and Household Change by EBOTS Subarea, Year 2010 - 2035

Location	2010	2035	Change
West Berkeley			
Employment	16,645	20,945	4,300
Households	7,718	9,369	1,651
Emeryville			
Employment	16,040	22,536	6,496
Households	5,694	10,603	4,909
West Oakland			
Employment	8,786	15,316	6,530
Households	6,795	11,861	5,066

Sources Plan Bay Area, City of Berkeley, BAE

[20] A more detailed discussion is contained in BAE's December 20, 2013 memorandum on the Economic Development Inventory and Opportunities Analysis, found in Appendix F

Emeryville's current development pipeline includes more than 2,000 new residential units, while more than 200 in are planned in West Berkeley. New employment-generating development is not currently as active, but is expected to pick up as the economic recovery continues, with the East Bay benefiting from spillover, as the San Francisco, Peninsula, and Silicon Valley areas become increasingly expensive, as has occurred in past cycles. In the near-term (next 5 years or less), current market trends suggest that Emeryville will see the most new development, followed by West Berkeley, and West Oakland Substantial new development in West Oakland is likely to accelerate in the medium-term (5 years+) and beyond, as the West Oakland Specific Plan is implemented, and fewer available sites remain in Emeryville and West Berkeley.

Transit and Local Economic Development

Appropriately planned and operated local transit can enhance economic development in two primary respects The first impact is related to mobility, or enhancing the ability of workers and residents to circulate within an area and make connections to the regional transit system Particularly for built-up areas with a strong economic base, enhanced local transit is critical to accommodate growth without substantial increases in congestion, especially for the EBOTS area with its limited connections to the regional transit system

The second impact from local transit is its potential to be an attractor for new development and new types of uses Early in Emeryville's redevelopment as a modern employment center, the establishment of the Emery Go-Round shuttle bus system was critical in attracting office-based employers who have staff that rely on BART to commute to work Similarly, Oakland is proposing to develop an "O" transit loop that connects West Oakland with BART, Downtown, and the Broadway corridor as part of the West Oakland Specific Plan's vision for attracting new uses and substantial equitable development to the area. The potential for local transit to be an attractor means that it can also increase a local area's share of future growth above what would otherwise occur

Another consideration for the EBOTS study is the extent to which new residential versus commercial uses generate more transit ridership A Public Policy Institute of California study, *Making the Most of Transit: Density, Employment Growth, and Ridership around New Stations* (Kolko et al, 2011), points out that while much of the emphasis has been on building residential around transit stations, across the US there is a stronger relationship between employment density and transit ridership than there is for residential density; at a Census tract level high density employment is correlated with 24 percent more ridership than high density residential

For West Berkeley and Emeryville, with the existing West Berkeley and Emery Go-Round shuttles, and AC Transit service, the expansion of existing service is more likely to generate mobility benefits than attraction benefits In other words, most, not all projected growth in these two PDA's would still likely occur if there is only limited expansion of transit service, assuming the West Berkeley and Emery Go-Round shuttles remain in operation.

For West Oakland, expansion of existing AC Transit Service and/or the creation of additional new high-quality local transportation options are likely to be important factors in attracting the substantial new development, firms, employees, and residents envisioned in the Specific Plan The lack of enhanced high-quality transit options for West Oakland is more likely to affect how much growth can be attracted to the area than it is for West Berkeley or Emeryville

Transit Technology and Economic Development

The success of streetcar systems in attracting new development activity in Portland, OR, Seattle, WA, and in other cities around the US has created tremendous interest More than 70 US cities are currently in one stage or another of proposed, planned, or under construction streetcar systems Streetcar systems are often claimed to generate greater economic development benefits because of developer preferences for systems with fixed investments, rider preferences for rail over buses, the higher quality rider experience with an electric streetcar vs a diesel or alternative-fuel bus; and the greater rider capacity that streetcars can provide Conversely, streetcar systems are considerably more expensive to develop and operate on a per-mile basis

The Institute for Transportation and Policy Development Policy (ITDP) recently published a study, *More Development for Your Transit Dollar: An Analysis of 21 North American Transit Corridors;* (Hook, Lotshaw, Weinstock, 2013)[21] that found that of the five transit corridors that generated the most investment in Transit-Oriented Development (TOD), on a dollar of TOD investment per dollar of transit investment, two were bus systems (Cleveland HealthLine BRT and Kansas City Main Street MAX bus), two were streetcars (Portland and Seattle South Lake Union), and one was light-rail (Portland MAX Blue Line) For the 11 transit corridors with "Moderate" TOD Impacts, seven were Bus Rapid Transit (BRT) or bus systems, and four were light-rail transit (and five of the BRT systems met ITDP's definition for high quality transit) Neither this study nor other research has been able to establish a TOD investment potential from regular transit bus operations

It is challenging and impractical for the EBOTS study to develop useful measures that can relate the amount of transit investment to a certain TOD outcome This is because transit investment often occurs in conjunction with agency revitalization plans and upzoning that in themselves spur development and increase the value of land, even without transit Development outcomes are also correlated to current development patterns, current market conditions, and future market potential, all of which vary from place to place Within the EBOTS subareas there is sufficient variation in these factors that it is not practical to develop measures for how much incremental investment in TOD would result from an incremental investment in transit.

Key Factors Shaping Transit and TOD

ITDP and other studies indicate that the following factors would be most important, in the following order, for determining how transit investment influences economic development

- Local government plans that allow for denser development and use revitalization techniques, including public investment, to spur development.
- Current development land market conditions, including the availability of opportunity sites

[21] Available at https //go itdp org/display/live/More+Development+for+Your+Transit+Dollar%3A+An+Analysis+of+21+North+American+Transit+Corridors

- Transit quality, defined as frequent service, high quality station design, passenger information systems, and other features (ITDP publishes a "BRT Standard" to score transit quality, much of which is applicable to other modes)[22]

- Current demographic and economic trends.

- The pedestrian orientation of areas around transit stations or stops.

All three EBOTS cities already have or will be implementing plans that have provided a framework for development to allow for substantial new development over the next 20 years and beyond All three cities have a similar built form and pedestrian orientation Transit quality is more about a set of design features and operational characteristics that can be applied to rail-based or bus-based transit Therefore, this factor does not support making distinctions between the concepts

Therefore, current development land market conditions and local demographic and economic trends are the two remaining factors that can be used to evaluate differences between the EBOTS transit concepts In the near-term, these factors would favor Emeryville, since this portion of the study area currently has the strongest current market for development, followed by West Berkeley and West Oakland In the medium-term and beyond, as implementation of the West Oakland Specific Plan would shift the development land market, the greater potential for growth would favor West Oakland, which could also offer the potential for a greater return, measured as TOD investment that results from the investment in transit To the extent that expanded transit in the EBOTS area is funded as a New Starts or Small Starts project, the federal and local processes for approval, construction, and commencement of operations is likely to be in the medium- to long-term, and take considerably longer than five years

For transit technology, the variance in TOD outcomes that ITDP identifies between streetcar and bus systems suggests that it should not automatically be assumed that a streetcar will result in a greater amount of new TOD and economic development With a focus on transit quality as more of a driver of TOD potential than the choice of transit technology, the potential for a streetcar should be evaluated in terms of its ability to move more people at lower cost within a given transit corridor than the bus alternative. The potential for a bus-based system to generate acceptance and interest similar to a streetcar system should be evaluated in terms of the quietness and smoothness of operation of the vehicle (with electric vehicles being ideal), the quality of stops and services, and its branding as a modern transit option

New Development Value Capture

Another set of criteria to evaluate the economic development potential of the transit concepts involved the extent to which it could be phased to better match development as it occurs, and the extent to which that development could contribute to capital or operating costs through value capture mechanisms Value capture is an important strategy for generating a portion of the local match required by many grant sources, as well as for generating direct investment and operating funds for new transit. Value capture techniques involve a range of financing tools that seek to generate funds from a portion of the value of new development Potential strategies specific to new development, and their applicability to EBOTS

[22] The categories for the BRT Standard are BRT Basics, Service Planning Infrastructure, Station Design and Station-Bus Interface, Quality of Service and Passenger Information Systems, and Integration and Access The BRT Standard is available at https://go.itdp.org/display/live/The+BRT+Standard

study area improvements, are shown below in **Table 8** (this list excludes general taxes that would apply to all properties, such as parcel taxes, sales tax increase, utility user tax increase, etc.).

Table 8: Value Capture Strategies Overview

Value Capture Strategies Overview		Updated AC Transit Bus Routes	Trunkline Connector (Enhanced Bus)	Streetcar Routes
Category	**Description**			
Tax Increment Finance (TIF)	Allocates a portion of new tax revenue for funding improvements. The current tool available in California is Infrastructure Finance Districts (IFD). These are challenging to establish under current law, and would likely require 2/3 voter approval. As a practical matter only the local city share of new tax revenues would be available. • Annual receipts tied to new development. Can be used for improvements (including bond financing) consistent with IFD legislation.		✓	✓
Assessment Districts	Creation of a district that imposes a surcharge on property tax bills. There are a wide variety of such districts under California law There are various property owner or voter approval requirements, typically 2/3. A Public Transit Benefit Assessment District (SB142) allows agencies operating transit to create an assessment district through Board action. • Annual receipts that can be used for improvements (including bond financing), or operating costs (depends upon district type).		✓	✓
Parking Assessment Districts	Creation of a new parking assessment district to use revenues from parking fees and fines to support transit operations • Annual receipts tied to parking meter rates and parking ticket charges.		✓	✓
Developer Impact Fees	Charges levied against new development to offset the cost of improvements to accommodate the impacts of that development. Requires preparation of a nexus study to identify the impact from development, cost of improvements to mitigate it (e.g. transit), and formula for appropriate allocation. • One-time payments from each new development project into the Capital Improvement Program per the nexus study.		✓	✓

Density Bonuses	Allows a developer to increase the size of a project for provision of a public benefit, e.g. contribution to transit improvement. This would require modification of existing plans in the EBOTS area. • One-time payments from each new development project that uses the bonus		✓	✓

California laws impose strict approval requirements, and limitations on use of funds, upon local jurisdictions that wish to use the above-listed value capture tools. Experience suggests that most of these tools are more likely to generate property owner, voter, and other public support for new and enhanced transit options (such as an Enhanced Bus Trunkline Connector or Streetcar), and less likely to gain approval for extensions of existing transit options that are seen as being financed by existing federal, state, and local sources (such as the AC Transit Enhanced Bus)

There are additional challenges tied to use of value capture that would need to be addressed in future studies. These challenges include

- **Timing** The amount realized from many value capture tools is tied to development, which is spread over time. By comparison, new transit needs to be build up-front as a system, leading to a mismatch between the timing of costs and revenues Another challenge is that development is highly cyclical, which means that revenues can vary greatly from year-to-year

- **Underwriting Financing** Bond underwriters look to established sources of revenues, rather than projections of potential future revenue This can make it difficult to use value capture tools, aside from assessment districts, as a fund sources to repay bonds

- **Implementation**: There should be consistency between the three cities in the EBOTS area in how value capture tools are used, which requires a greater than usual level of coordination

These challenges can be addressed through phasing of improvements and obtaining loans from local cities' other funds, among others. The challenges of creating an integrated transit system that spans and benefits three cities in the EBOTS area may justify the creation of revenue-sharing arrangements between the three cities to allow more effective use of value capture tools to help fund transit

Potential Value of Development and Value Capture

This section provides an estimate of the potential value of new development in the EBOTS area from 2015 through 2035. Such a discussion is highly conceptual at this stage of planning, and these figures should be considered an indication of the potential magnitude of funds for discussion, rather than a projection of expected receipts. Much more detailed study would be needed to come up with figures that could be used for a financing strategy to fund project costs.

The first step to projecting value capture is to identify the amount of development to which value capture tools could be applied The projections of EBOTS area future household and employment growth previously prepared were reviewed, and pro-rated for the amount of development that is yet to occur in the EBOTS area, as shown in the **Table 9**

Table 9: Projected new Development Measures in the EBOTS Area, 2015-2035

Projected New Development, EBOTS Area, 2015-2035				
	West Berkeley	Emeryville	West Oakland	Total
Housing Units	679	3,014	4,053	**7,746**
Commercial – sq ft	812,000	1,617,124	1,417,692	**3,847,616**

Note The above table is based on the lesser of Plan Bay Area projections or individual City estimate of maximum build-out allowed per existing plans

Sources Plan Bay Area Final Forecast, July 2013, Cities of Berkeley, Emeryville, and Oakland, BAE, 2014

Over the 20-year period from 2015 to 2035, assuming value capture tools can be put in place in the near-term, these could be applied to up to approximately 7,700 new dwelling units and 3.8 million square feet of all types of new commercial development

The value of this amount of new development was calculated based on the real estate market values identified in Appendix F These values are considered to be "mid-point" values in the economic cycle, and thus represent an appropriate average as well as a conservative approach to calculating value creation As shown in the **Table 10** below, new development in the EBOTS area would have a potential value in excess of $3 5 billion through 2035, and would generate more than $35 million in new annual property tax revenues by 2035 (with revenues starting at $0 in 2015 and growing as development occurs) Cities only collect a share of property tax revenues, with the rest going to school districts, counties, and other special districts. Using a conservative assumption that the local city share would average 20 percent, by 2035 there could be a total of just over $7 million in new annual property tax revenues combined from new development throughout the EBOTS area.

Table 10: Potential New Property Tax Increment, EBOTS Area, 2015-2035

Potential New Property Tax Increment, EBOTS Area, 2015-2035			
	Quantity	Average Value per du/sq ft	Total
Residential			
Multifamily Residential	5,422	$294,000	**$1,594,000,000**
Multifamily For-Sale	2,324	$410,000	**$973,600,000**
Commercial			
All Uses	3,847,616	$260	**$1,000,400,000**
Projected Value of New Development			**$3,568,000,000**
Annual New Property Taxes at 1%			**$35,680,000**
City Share at Average 20% of New Increment			**$7,136,000**

Source BAE, 2014

Cities will look to set aside a large part of this new increment, likely at least half or more, to fund the increased cost of new public services to serve new development. However, the above figures do suggest the following magnitude of potential value capture for discussion·

- TIF/IFD financing, assuming property owner/voter approval, and based on 50 percent of the local city share of available increment, and using general bond underwriting principles, could support up to $30 million or more in bond financing by 2035 – if credit guarantees or other solutions are found to meet the challenge of available increment being much lower in early years

- Assessment districts, if they can obtain property owner approval at a level equal to 0.1 percent of assessed value, could generate approximately $3.5 million in annual revenues by 2035, and support up to $30 million or more in new bond financing

Further study, and evaluation of policy, political, and other considerations, would be needed to quantify the revenues that could be generated from impact fees, density bonuses, parking districts or other tools. For discussion purposes, it would be reasonable to consider that a combination of these other value capture techniques could potentially generate funds comparable to TIF or assessment districts

Comparison of EBOTS Transit Options

The preceding discussion addressed the relationship between transit and local economic development and the factors that are likely to shape the impact of the transit alternatives in the EBOTS subareas. Each alternative would have different implications for economic development, with no one of them being clearly superior The advantages and disadvantages associated with each option in terms of local economic development and implementation tied to economic development are summarized as shown in **Table 11** below

Table 11: Economic Development Impact by EBOTS Transit Project

Service	Advantages	Disadvantages
Trunkline Connector Route	• Enhanced access to Emeryville development opportunity sites • North-South orientation promotes trips between destinations in EBOTS area • Further expands access to and quality of transit in West Oakland	• No connection to MacArthur BART, busiest East Bay station outside Downtown Oakland and Downtown Berkeley • Enhanced access to Emeryville is limited to Hollis Street, and does not provide a direct connection to the Emeryville Shops • East-West connection carried by limited capacity of Emery Go-Round
Streetcar Routes	• Provides a connection from Jack London Square through West Oakland as well as from MacArthur BART to West Oakland • Gives direct access from MacArthur BART station to Shellmound • Phasing can be done by route; value capture by each city • Oakland alignment covers the "O" loop envisioned by City • Could handle increasing ridership in parts of Emery Go-Round routes with heaviest demand	• No additional West Berkeley or North Oakland connectivity • Service to Shellmound is not enhanced to/from destinations north of this area. • Because Emeryville has the most active market for new development in the Inner East Bay, enhanced service to Emeryville is not likely to generate significant additional development

In addition to the advantages and disadvantages that each transit option would offer in total, it is important to also consider the impact that each individual EBOTS subarea may experience for each option.

West Berkeley

- Routes through this subarea exhibit modest potential to spur economic development due to new transit service, primarily because there is greater market demand than available sites and allowable development pursuant to the West Berkeley Plan This reduces the ability of new transit to spur additional TOD investment The Trunkline Connector could be advantageous because it provides more service to West Berkeley destinations and extends its northern reach closer to opportunity areas at the northern end of the Priority Development Area (PDA).

Emeryville

- Routes through this subarea exhibit modest potential to spur economic development due to new transit service, primarily because Emeryville has the most active market for new development in the Inner East Bay and as long as the Emery Go-Round continues to provide service, additional transit service is not likely to generate significant additional development (although current service does not have the capacity for future growth). Both the Trunkline Connector and Streetcar proposed routes are advantageous because they provide service through this area from West Oakland and MacArthur BART stations

West Oakland

- Routes through this subarea exhibit substantial potential to spur economic development due to new transit service This is because new modern transit, in conjunction with implementation of the strategies, including public investment, outlined in the West Oakland Specific Plan, has the potential to accelerate market interest in new development in West Oakland The Trunkline Connector service and West Oakland Streetcar service proposed routes would both provide a high level of service along Mandela Parkway, and provide direct access to the largest number of opportunity sites for new development The Streetcar two-route concept is functionally the same as the "O" transit loop proposed in the West Oakland Specific Plan

6. Funding and Implementation

The purpose of this initial inventory is to identify sources of funds that might be available for the construction, operation, and maintenance of the transit service options being considered for the EBOTS study area and provide a real world roadmap for positioning potential projects for funding. The scan of sources will provide a basis from which fund sources can be further analyzed for applicability, availability, and requirements and timelines for obtaining funding for specific elements of a recommended EBOTS transit service alternative.

Federal Funding Recipients

In some cases there may be issues receiving Federal funding depending on the applicant and operator of the transit route. Since the operator has not yet been defined for the Trunkline Connector or Streetcar routes, this information will be important in understanding the types of funding available and who could be the operator.

For urbanized areas with 200,000 in population and over, funds are apportioned and flow directly to a designated recipient selected locally to apply for and receive Federal funds Funding is made available to recipients that must be public bodies with the legal authority to receive and dispense Federal funds under 49 U S C. 5307 It is important to note that becoming a direct recipient can be difficult. In addition to the legal authority that is required to become a recipient, applicants may also fall under the federal compliance requirements such as having a ½ fare for senior/disabled passengers, providing complementary paratransit service, complying with federal procurement regulations, and fulfilling transit related Title VI anti-discrimination requirements.

Additionally, funding is allocated on the basis of legislative formulas. In the Bay Area, it is based on a combination of bus revenue vehicle miles, bus passenger miles, fixed guideway revenue vehicle miles, and fixed guideway route miles as well as population and population density That means that a fixed dollar amount comes to the region and is divided among the direct recipients (transit agencies) Because the 5307 and 5339 funds are overprescribed, as indicated, an applicant would need to first become a legal entity that can access the funds, while convincing the regional partners that funds should be allocated

Section 5312 funds can be available to non-transit operators Eligible recipients are determined for each competition, and may include. universities, public transportation systems, state Department of Transportation (DOT), non-profit and for-profit entities, amongst others However, this year's competition is limited to existing direct recipients of Federal Transit Administration (FTA) grants.

Potential Funding Sources

The potential funding sources described below take into account certain capital costs the proposed new Trunkline Connector Route, and the proposed West Oakland and Emeryville Streetcar Routes However, to take advantage of traditional sources of operating and capital funds, projects must be included in local and regional transportation planning documents Some potential funding sources described below specify they are for operating and maintenance costs as well, specifically the

Transportation Development Act (TDA) and the State Transit Assistance (STA) and fare revenues Table 12 lists which funding sources would be possible options for each improvement type.

Table 12: Summary of Potential Funding Sources by Project

Potential Funding Sources		Trunkline Connector Route	Streetcar Routes
Source	**Description**		
Section 5307 Urbanized Area Formula Funds	These funds go to transit operators, and are already fully subscribed. The project sponsor would have to persuade an agency to use its funds for the proposed projects. For vehicle costs, all expansion vehicles must be in the Short Range Transportation Plan (SRTP) and the Regional Transportation Plan (RTP). Generally these funds are used for replacement vehicles, not expansion vehicles. • Annual distribution on a formula basis	✓	
Section 5339 Bus and Facilities Program	Can be used for vehicles and to construct bus related facilities. These are relevant to new bus and facility capital costs. • Regional distribution on a formula basis annually	✓	
Congestion Mitigation and Air Quality Improvement (CMAQ) Section 5307 Urbanized Area Formula Funds	Projects must be in the local Transportation Improvement Program (TIP) The Metropolitan Transportation Commission (MTC) has a three year programming cycle for the funds it manages and the local Congestion Management Agency (CMA) administers its share through the One Bay Area Grant Program This funding source is particularly relevant for new bus vehicles. • Funds are programmed in cycles	✓	
Section 5309 New Starts Funding	This funding is administered and competed for nationally It is the main source of significant funding for streetcar improvements, although matching funds will need to be found. Must have on-going operating sources confirmed prior to federal full funding grant agreement. • The process to be in a full funding grant agreement often takes years and only after NEPA document has been certified		✓
Transportation Development Act (TAD)/State Transit Assistance (STA)	Funds allocated to transit operators for use on operating and capital expenditures They are fully subscribed These are relevant for capital costs as well as operations and maintenance costs. • Annual distribution	✓	✓

Potential Funding Sources		Trunkline Connector Route	Streetcar Routes
Source	**Description**		
Transportation Fund for Clean Air (TFCA)	The Bay Area Air Quality Management District's TFCA can be used for clean air vehicles only Can fund shuttle service connecting to train stations. • Ongoing collections	✓	
Alameda County Measure B Sales Tax	Funding can be used for capital and operating expenses Targeted to projects and programs identified in the Transportation Expenditure Plan approved by the voters. • Ongoing collections	✓	
State Transportation Improvement Program (STIP)/Regional Transportation Improvement Program (RTIP)	These funds are at historical lows and significant amounts of them are currently programmed to AC Transit for the East Bay Bus Rapid Transit (BRT) through 2028. • Programmed for multiple years	✓	
Fare Revenues	Fares only cover a percentage of the cost of operating service While these revenues can be used for operations and maintenance as well as capital costs, they tend to be used for operations and maintenance because the cost of operations far exceeds the fare revenue received • Ongoing collections	✓	✓
Senate Bill 142 (SB142)/Public Transit Assessment District	Transit District, municipal operator, or other public agency operating transit, commuter rail, or intercity rail services to approve, by a two-thirds majority, to issue bonds and levy a fee on the special district for bond repayment To be implemented, the levy may not be opposed by a majority of the properties affected. Funds may only be used for capital costs The area in the benefit district must be within a half mile of the center point of the transit station. Further, projects must provide special benefits to the parcels of land and improvements to land within the vicinity of the rail station		✓
Property-Based Business Improvement District	One is in place already in Emeryville and supports the Emery Go-Round shuttle Business owners in a specific area pay a fee to fund improvements and/or improve the quality of the area paying the fee	✓	✓

Potential Funding Sources		Trunkline Connector Route	Streetcar Routes
Source	**Description**		
Transit Investments for Greenhouse Gas and Energy Reduction (TIGGER)	Can help fund electric buses that use batteries.	✓	

Trunkline Connector Route

Funding Sources

For the Trunkline Connector route, the operator and the specific enhancements making up the bus route need to be identified. Many of these improvements also need to be specified in regional planning documents, as well as in the planning documents of the sponsor agency The funding strategies do not take into account need for replacement of vehicles after initial purchase, which increases the total capital cost at the time the vehicles and other infrastructure need to be replaced (approximately 12 years for buses)

Bus Capital Cost Funding Sources (all costs including a new bus line and bus stops):

- Section 5307 Urbanized Area Formula Funds (annual distribution on a formula basis)
- Transportation Development Act (TDA)/State Transit Assistance (STA) funds (annual distribution)
- Alameda County Measure B Sales Tax (ongoing collections)
- State Transportation Improvement Program (STIP)/Regional Transportation Improvement Program (RTIP)

Clean Air Vehicle Capital Cost Funding Sources:

- Section 5307 Urbanized Area Formula Funds (annual distribution on a formula basis)
- Section 5339 Bus and Facilities Program (regional distribution on a formula basis annually)
- Congestion Mitigation and Air Quality Improvement (CMAQ) Section 5307 Urbanized Area Formula Funds (programmed in cycles)[23]
- Transportation Development Act (TDA)/State Transit Assistance (STA) funds (annual distribution)

[23] Hybrid vehicles must meet certain requirements http //www epa gov/fedrgstr/EPA-AIR/2007/May/Day-24/a9821 htm

- Bay Area Air Quality Management District's Transportation Fund for Clean Air (ongoing collections)

- Alameda County Measure B Sales Tax (ongoing collections)

Operation and Maintenance Funding Sources:

- Transportation Development Act (TDA)/State Transit Assistance (STA) funds (annual distribution)

- Fare revenues (ongoing collections)

Operator Options

Many aspects of the system, particularly costs, will be dependent on the operator of the proposed system Additionally, many funding options require the operator to be specified in advance of the project start. The options below should be considered for choosing an operator

- **ETMA as Operator.** A new association could be formed or the Emeryville Transportation Management Association could expand, if property owners in West Oakland and West Berkeley (and Emeryville if it is a second association) vote to join an improvement district Someone would have to initiate the formation or expansion and conduct the election

- **AC Transit as Operator** AC Transit receives Federal funding Or a new transit agency could be formed, but Federal Transit Administration (FTA) allocates funding to AC Transit and BART by formula for some of its programs.

Streetcar Routes

Funding Sources

The addition of streetcar service is an addition to the Trunkline Connector proposed route However, a full analysis needs to identify the project sponsor for the street car service Certain improvements also need to be included in regional planning documents, as well as in the planning documents of the sponsor agency in order to take advantage of new funding sources not currently contemplated such as a regional gas tax. The funding sources do not take into account need for replacement of vehicles after initial purchase, which increases the total capital cost at the time the vehicles and other infrastructure need to be replaced (approximately 30 years for streetcar infrastructure and vehicles).

Capital Costs (all elements of the streetcar infrastructure):

- Section 5309 New Starts Funding

Operation and Maintenance Funding Sources:

- Transportation Development Act (TAD)/State Transit Assistance (STA) funds (annual distribution)

- Fare revenues (ongoing collections)

Operator Options

There are several options for choosing an operator for the proposed Streetcar routes These options are closely related to how the system is funded Several options include

- **ETMA as Operator** A new association could be formed or the Emeryville Transportation Management Association could expand, if property owners in West Oakland and West Berkeley (and Emeryville if it is a second association) vote to join an improvement district. Someone would have to initiate the formation or expansion and conduct the election.

- **Current or New Transit Agency as Operator** AC Transit and BART receive Federal funding If they were interested, they could add the new service – perhaps BART for streetcars Or a new transit agency could be formed, but Federal Transit Administration (FTA) allocates funding to AC Transit and BART by formula for some of its programs

- **Three-City Joint Powers Authority (JPA)** The three cities, with or without AC Transit and/or BART, could form a Joint Powers Authority (JPA), but a JPA would have a hard time competing with existing transit agencies for funding

Fund Readiness Strategies

It is not sufficient to simply identify potential capital and operating sources to build and operate expansion projects A successful funding strategy will be based on sound project planning, and will require a good deal of political will Because major capital investments are costly and almost always require a variety of funding sources from all levels of government, it is important for project sponsors to understand what is needed to take advantage of new funding that may become available. For projects that are not yet a part of regional and local planning documents, it can be a challenge to access traditional transit funding resources, which are generally committed in advance to projects that have been in the queue for several years. Therefore non-traditional funding might be available more quickly, such as Business Improvement Districts (BIDs), or transit benefit assessment districts.

In the event that funds can be identified through BIDs, Developer fees, or other non-traditional transit related funding, projects may be able to be forwarded at a much quicker pace This can be helpful for accessing project development funds that would help advance the project in order to take advantage of traditional federal and state transportation funds **Table 13**, below, represents the timeline and strategies if projects can find "Independent Means" to implement portions of the project sooner Due to the cost of the Streetcar Alternative, it is assumed that some level of federal funds would be sought

Some of these steps are similar to the Fund Readiness Strategies in order to ensure that projects are included in required planning documents should they wish to qualify for federal, state or local fund programs. Additionally, even though the list is numbered, some tasks can occur concurrently (such as procuring vehicles at the same time as local decision making process for the alignment of the streetcar)

Table 13: Independent means Fund Readiness Strategies

Independent Means Fund Readiness Strategies	
Time Frame	**Action**
1 - 5 years	1. Establish project sponsors for trunkline connector and streetcar routes 2 Determine priority for improvements for future study 3. Confirm priority with project sponsors 4. Ensure AC Transit projects are included in AC Transit's Short Range Transit Plan 5. Obtain funds for Project Development for capital investments (trunkline connector and/or streetcar service) 6 Conduct process to establish local decisions on mode and alignment for major capital investments, including alternatives analysis for trunkline connector and streetcar routes 7. Complete required environmental and Plans, Specifications & Estimates (PS&E) for trunkline connector bus alternatives (includes Title VI minority and low-income anti-discrimination analysis)
5 - 10 years	8. Secure funds for vehicle expansion (bus alternatives) 9. Secure operating funds for trunkline connector bus alternatives 10 Procure vehicles for bus alternatives 11 Ensure projects are included in local and regional transportation plans (Countywide Transit Plan, RTP, Countywide Plan) 12. Complete required environmental documentation for streetcar 13. Secure operating funds in order to secure federal 5309 funds 14. Secure local match funds for federal program 15 Secure federal funds for major capital investments 16. Preliminary Engineering for streetcar routes
10 - 20 years	17. Design and Construction of streetcar routes

Other Potential Sources

Other potential funding sources exist, but in some cases the projects will need to have a more fully developed scopes before it can be determined whether these sources are potential matches or not In other cases, the funding sources are dependent on new development, or the adoption of additional fees or taxes, and therefore are more speculative or have longer lead times. The additional potential sources are listed in **Table 14**

Table 14: Additional Potential Sources of Funding for Proposed Routes

Funding Source	Element
Highway-Rail Grade Crossing Program	For elements at railway-highway crossings including signing and pavement markings at crossings, active warning devices (e.g lights and gates), crossing surface improvements, sight distance improvements, grade separations (new and reconstructed), and the closing and consolidation of crossings.
Transit Oriented Development Planning Pilot	For new fixed-guideway and core capacity improvement projects that focused growth around transit stations to promote ridership, affordable housing near transit, revitalized downtown centers and neighborhoods, and encourage local economic development. • Pilot program funding may not be available in future
Federal Transit Administration (FTA) Section 5312 Research: Low or no Emission Vehicle Deployment	For projects in nonattainment or maintenance areas, funding for capital projects for low or no emission vehicles, facilities and related equipment • Must be a section 5307 eligible recipient (governors, responsible local officials, and publicly owned transit operators). • The Metropolitan Transportation Commission (MTC) would need to submit application.
Federal Transit Administration (FTA) Section 5310 Enhanced Mobility Seniors and Individuals with Disabilities	This source is applicable if any of the service benefits the target populations
Developer Fees	Fees that can be used to pay for public facilities necessitated by development. Generally, a nexus study must demonstrate that the development dictates the need for the facilities
OneBayArea Grant Program	Program administered by the Alameda County Transportation Commission (ACTC) and the Metropolitan Transportation Commission (MTC) that combines many sources of funding in support integrating the Federal Transportation Program with California's climate law.
New Transportation Sales Taxes	Alameda County is currently planning to put an additional sales tax measure on the ballot in November 2014 in support of transportation projects in the County • Includes a grant for shuttles for which cities can apply • Cities have the ability to put such a tax on the ballot, as well, depending

Funding Source	Element
	upon their identified need.
Prop 1B Traffic Light Synchronization	This funding can be used in support of traffic light synchronization projects.
Parcel Taxes	Through a two-thirds vote of property owners, the imposition of a tax for a specific purpose. • Can be put on the ballot by cities, counties, AC Transit or BART.
Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant Program	Administered by the federal government, this program funds rail and transit projects which promise to achieve critical national objectives.