TREASURE VALLEY HIGH CAPACITY TRANSIT STUDY

DOWNTOWN POLICY ADVISORY COMMITTEE, 3:30 P.M.

Monday, September 8, 2008

LOCATION: Capital City Development Corporation, Conference Room

121 N. 9th Street #501, Boise, Idaho

****AGENDA****

Item	Speaker	Action Needed	Time/ Documentation
1. **Review June 9, 2008 Minutes** *Pages 2-4*	Kelli Fairless	**Approval**	**5 Minutes** *Information Attached*
2. **Review Downtown Circulator** • Circulator Update o City Initiative & Schedule • Technical Reports *A.* Concept Design Update *B.* Opportunities & Constraints *C.* Traffic Review *D.* Environmental Review *E.* Mode Assessment *F.* Bus Circulator Option *Pages 5-93*	Bob Post	**Review**	**30 Minutes** *Information Attached*
3. **Review Federal Funding Issues for Streetcars** *Pages 94-98*	Bob Post	**Review**	**15 Minutes** *Information Attached*
4. **Review Downtown Multimodal Center** • Tour of Transit Centers • Site H Update o NEPA Document o Follow Up with Federal Transit Administration o Next Steps	Bob Post	**Review**	**30 Minutes** *Information Presented at Meeting*
5. **Schedule and Next Steps** *A revised schedule is attached.* *Pages 99-100*	All	**Review**	**5 Minutes** *Information Attached*

Treasure Valley High Capacity Transit Study
Downtown Policy Advisory Committee
June 9, 2008 Meeting Minutes
Capital City Development Corporation Conference Room
Boise, Idaho

Attendees:	Rebecca Arnold, Commissioner, Ada County Highway District A.J. Balukoff, Community Planning Association Representative Ed Dahlberg, Boise Metro Chamber of Commerce Representative David Eberle, Councilman, City of Boise Dale Higer, Private Sector Representative – At Large Rob Hopper, Councilman, City of Caldwell, Valley Regional Transit Representative Cheryl Larabee, Capital City Corporation Board of Directors Monte McClure, Idaho Transportation Board Paul Woods, Commissioner, Ada County
Members Absent:	Jim Tomlinson, Downtown Boise Association Representative
Others:	Nancy Brecks, Community Planning Association Jon Cecil, Capital City Development Corporation Rosemary Curtin, RBCI Kelli Fairless, Valley Regional Transit Bryant Forrester, Urban Concepts Miguel Gaddi, HDR Phil Kushlan, Capital City Development Corporation Carter MacNichol, Shields Obletz Johnsen Bob Post, URS Corporation Matt Stoll, Community Planning Association Charles Trainor, Community Planning Association

Call to Order

Chair Higer called the meeting to order at 3:35 p.m.

1. Review May 12, 2008, DPAC Meeting Minutes

Monte McClure moved and Rob Hopper seconded approval of the May 12, 2008, meeting minutes as presented. Motion passed with David Eberle abstaining.

2. Review May 22, 2008 Open House Report

Rosemary Curtin presented a summary report on the May 22, 2008 Project Open House. She stated 250 people attended the Open House and based on the public input, Site H was the preferred site and the Main and Idaho Couplet was the preferred circulator alignment.

3. Adopt Initial Segment Alignment (DBC)

Bob Post presented the two initial segments for the downtown circulator; Idaho, Main Couplet; and the Idaho, Main/Idaho, Bannock Couplet. He stated, based on its review, the DTAC recommendation is to advance the Idaho, Main/Idaho, Bannock alignment.

Bob stated the adoption of an alignment will provide the basis for a more detailed assessment of a circulator project including the review of potential funding mechanisms.

After discussion, **David Eberle moved and Cheryl Larabee seconded approval of the Idaho, Main/ Idaho, Bannock Couplet as the preferred alignment with the understanding that there are further steps to go through before a final alignment is chosen. This will start the process of discussions with effected agencies. Motion passed with Rebecca Arnold and Monte McClure voting nay.**

Commissioner Arnold noted for the record that she voted no because she feels it is inappropriate for DPAC to make a decision without consulting the agency (ACHD) that owns the right-of-way and is responsible for signal timing.

4. Review Preferred Candidate Site Issues

Charles Trainor reviewed concerns regarding Site H heard at the May 2008 Open House and from discussions with the Downtown Boise Association.

After further discussion with the Downtown Boise Association, members have agreed to work with the consultant team and VRT on how the center will be designed and what services will be important. Members have also volunteered to participate June 26th and 27th on a tour of multimodal facilities in Oregon (Eugene, Salem and Portland) and talk to adjacent businesses. ACHD will be invited to participate as well.

Charles said letters of support for candidate Site H have been received from CCDC and Boise City. The COMPASS Board will be asked to endorse a letter of support at its June 16, 2008 meeting. Staff will be meeting with the ACHD Commission on June 18, 2006 and Monte McClure has agreed to work with ITD regarding a letter of support.

5. NEPA Documentation Update

Bob Post provided an update on the NEPA documentation process for candidate Site H. The document is complete, but is on hold until the VRT Management Committee meets on July 7, 2008, and the letters of support are secured.

6. Schedule and Next Steps

Charles reviewed a tentative DPAC meeting schedule for September – December 2008 and January 2009.

The next DPAC meeting is scheduled for July 14, 2008, at CCDC from 3:30-5:30 p.m.

Agenda Items:

1. Comparison of Local vs. Federal Funding for the Circulator
2. Discuss Mode Choice: Rubber Tire or Rail

Adjournment

A.J. Balukoff moved and Cheryl Larabee seconded adjournment at 5:10 p.m. Motion passed unanimously.

September 8, 2008

Topic: Downtown Circulator Supporting Technical Reports

Summary:
The Downtown Boise Circulator portion of the Treasure Valley High Capacity Transit Study is in the process of transitioning from the current leadership of COMPASS and VRT to the City of Boise and CCDC. As an element of the transition, a Conceptual Design Report for a streetcar option was produced and presented at the June 9, meeting of the DTAC and DPAC committees. As a follow up to the materials contained in the Conceptual Design Report, the consultant team was requested to produce a series of technical memorandums that would conclude the planning phase of the circulator project. The technical memorandums provide additional definition of the streetcar option and identify elements that future design phases will need to pay special attention to. The memorandums also serve to complete the original project scope by defining of both the streetcar as well as a bus circulator option. The enclosed Technical Memorandums includes:

Streetcar Concept Design Update - At the June 9, DTAC and DPAC meetings the consultant team was requested to address in additional detail two elements of the preferred Main/Idaho, Idaho Bannock Couplet streetcar alignment. The first was a more detailed review of the transition from the adopted alignment to the Fairview/Main Couplet that is anticipated to function as a future extension to the west. A concern was expressed regarding the traffic impacts on Main Street between 16th and 17th Streets. A more detailed layout of two options for this area are presented. The second item was a concern regarding the size of the candidate sites for a streetcar maintenance and storage facility. The Technical Memorandum presents a layout on the smaller of the two candidate sites (Front between 15th and 16th), illustrating a layout that will accommodate the required functions and at least 6 vehicles (three vehicles are anticipated to be required for startup).

Opportunities and Constraints - This memorandum presents background information regarding the selected streetcar alignment for use during the follow-on design phases. Identified are elements of the concept design that require special attention, either because they represent a cost risk or present an opportunity to avoid significant project costs. Also identified are elements that will require careful design attention due to sensitive issues such as special traffic signal applications and interface with designated bike lanes.

Traffic Review - This is not a detailed traffic impact assessment, rather a recording of those locations that the current conceptual design has assumed either requires modifications to the current traffic pattern, a special streetcar signal phase or new signals. Also addressed are other traffic related items that will need to be dealt with in the subsequent phases of design.

Environmental Review - With the assumption of the use of local funding a formal NEPA process is not required for the circulator project. This technical memorandum only focuses on those environmental elements that may in some form impact or influence the project design. Included are the identification of historically designated structures, the location of potential "critical receptors", parking space impacts, access issues and a brief outline of construction phase considerations.

Mode Assessment - A presentation of the vehicles available and in common use for downtown rail and bus circulator applications. Included are general descriptions of the vehicle characteristics, operating features and costs.

Bus Circulator Option - The consultant team was requested to prepare a description of a bus-based circulator utilizing the alignment selected for the streetcar option. This memorandum describes that bus option including an operations plan and capital and operating costs.

Staff Recommendation / Request:
This agenda item presents requested information intended to assist in the transition of the Circulator project to the City and CCDC. The DPAC is asked to accept the information as completing URS' work on the circulator and to recognize the transfer of the Circulator project oversight to Boise City and CCDC.

Implication (policy and / or financial):
The materials presented are intended to help address questions that may arise regarding the concept design of the streetcar option and assist in focusing the initial portion of the design phase on project elements that can most significantly impact project costs and schedules.

Highlights:
See above.

More Information / Attachments:

Attachments –

- Streetcar Concept Design Update Technical Report
- Opportunities and Constraints Technical Report
- Traffic Review Technical Report
- Environmental Review Technical Report
- Mode Assessment Technical Report
- Bus Circulator Technical Report

Contact - Bob Post, URS Project Manager at (503) 948-7230

Treasure Valley High-Capacity Transit Study

Downtown Boise Circulator

Streetcar Option

Concept Design Update

Technical Memorandum

August 2008

Prepared for:

Valley Regional Transit
Community Planning Association of Southwest Idaho

Prepared by:

URS Corporation

The purpose of this memorandum is to respond to the request for additional information not available in the Concept Design Report presented on June 9. The two items raised were in regards to the connection of a future west streetcar extension to the Fairview/Main couplet and the feasibility of the potential maintenance facility sites to accommodate the required operations and maintenance functions. The following paragraphs provide additional detail and potential layouts (see attached drawings) for these two design elements.

Fairview/Main future connection:

With the adopted streetcar alignment (Main/Idaho, Idaho/Bannock) a request was made to further evaluate the potential future streetcar extension to the west. The future extension would be a couplet along W. Fairview Ave and W. Main Street and connect to the downtown circulator streetcar alignment at 16th and Idaho for the outbound streetcars and at 17th and Idaho for the inbound streetcars. The attached drawing, Sheet No. B.002a, and description below provide further details of two potential options.

Future Connection General Alignment:

The future extension would connect to the preferred downtown circulator option (Main/Idaho, Idaho/Bannock) at 16th & 17th Streets at Idaho Street. The future outbound streetcar would continue on the downtown circulator alignment heading west bound along Idaho until 16th Street. At 16th Street, a turnout would be added and the future streetcar would turn south into the existing westerly most turn lane. The streetcar would continue south for one block to W. Main Street where it would turn west and continue west on Main Street.
The inbound streetcar connection would head eastbound along W. Fairview Ave. to 17th Street. At 17th Street, the alignment would turn north and continue to Idaho Street where it would connect to the downtown circulator alignment.

Future Alignment Traffic Concerns and Potential Mitigation:

Concerns were raised regarding the future connection and existing traffic congestion that has been observed between 16th and 17th Streets along W. Main Street. A traffic analysis should be performed to identify the extent of congestion and queuing in this reach of Main Street. However, to address this concern URS evaluated two potential alternatives that could be applied to mitigate congestion and/or reduce the potential for streetcar to be inhibited by traffic queuing between 16th and 17th Streets.

The first of the two potential options would re-stripe W. Main Street between 16th and 18th Streets, adding an additional travel lane from 16th to 18th for westbound Main Street traffic. The modified 3 lane section would increase the capacity of Main Street by approximately 30% +/- reducing the traffic congestion and potential for diminished streetcar operation. In order to accommodate the additional travel lane, the northbound traffic on W. Grove Street would have to merge from the existing two lanes to one lane just east of 18th Street. Due to the I-184 connector (Front/Myrtle) improvements reducing the travel demand along Main/Fairview, no significant impact to NB Grove Street traffic is anticipated. The modified striping on Main Street would match existing lane configuration west of 18th Street.

The second option would be to provide a streetcar only "by-pass" lane for this reach of Main Street. This option would maintain the same number of existing traffic lanes on all adjacent streets and through re-striping, add a third exclusive streetcar only lane between 16th and 17th Streets allowing the streetcar to "by-pass" the auto traffic congestion while maintaining the current auto capacity. At 17th Street, the streetcar would then receive a queue jump and reenter the auto lane and continue westerly along W. Main Street.

These two options are illustrated in the attached drawing (Sheet No. b.002a). These options are only to illustrate the feasibility of mitigating for traffic congestion concerns at this location. A complete traffic analysis would be required at the time an extension of the streetcar line is planned to identify the current traffic issues and best way to address them.

Streetcar Maintenance Facility candidate sites:

There are two potential maintenance facility sites that have been identified for the downtown circulator. The attached drawing, Sheet No. B.013, illustrates a conceptual layout for the maintenance facility located at the smaller of the two sites on Front Street between 15th and 16th. This site would include all the functions necessary to maintain the starter fleet of vehicles (3 streetcars) as well as having potential to accommodate additional vehicles as the system expands with an ultimate capacity for approximately 6-7 streetcar vehicles.

The following are typical requirements for a basic starter streetcar maintenance facility and are included in the layout shown in the exhibit:

- Maintenance Facility Building:
  - General repair bays for routine and unscheduled maintenance and inspections
  - Office space, shop areas, break room, parts storage, employee amenities
- Vehicle Wash Pad
- Employee & Visitor Parking
- Storage Tracks

Some maintenance activities will have to be accomplished offsite as it is not cost effective to acquire the equipment for a smaller fleet. An example would be wheel truing. Wheel truing machines cost nearly $2 million and are typically only found at facilities servicing large fleets. For a starter system with 3 vehicles, it is more cost effective to accomplish this and similar types of activities, offsite at a local machine shop.

The other potential location for a maintenance facility is along Idaho Street between 16th and 17th. This site is the larger of the two potential sites and would be able to accommodate a similar fleet of streetcar vehicles. In both cases, the layout is based on the Portland Streetcar vehicle (Skoda) and may require revisions should a different vehicle be selected. Some streetcars may be longer than the Skoda and could be accommodated but may reduce the overall capacity of the site.

ITEM
2B

Treasure Valley High-Capacity Transit Study

Downtown Boise Circulator

Streetcar Option

Opportunities and Constraints

Technical Memorandum

August 2008

Prepared for:

Valley Regional Transit
Community Planning Association of Southwest Idaho

Prepared by:

URS Corporation

The purpose of this memorandum is to identify both opportunities and constraints to be addressed as the Downtown Boise Circulator “Idaho, Bannock/Main, Idaho” option is moved into the next phase of design. A preliminary screening and evaluation of potential “flaws” was accomplished as part of the current feasibility study. No “fatal flaws” were identified, however as the project progresses focus should be put on several design constraints to minimize the risk and unknowns in these items. The following sections describe both opportunities to refine the designs and cost estimates as well as identifying constraints that must be addressed.

Utilities:

An initial evaluation of utilities was accomplished to assign an estimated utility relocation allowance along the alignment. However, several factors require further evaluation before a detailed and more accurate cost for utilities can be accomplished. The following is a list of key items requiring more detail and evaluation in order to further refine the utility portion of the cost estimate:

- Franchise agreements with both public and private utilities need to be evaluated to establish whether the burden of relocation costs of each utility will be part of the project cost or the responsibility of the owner of the utility.
- Project standards for utility relocations will need to be established. For example, clearance standards (track to utility) often differ depending on the city, the implementing jurisdiction and the utility owner. Discussions with the various utilities and setting clear standards are important steps to take early in the design process.
- Accurate base mapping of all public and private utilities is needed to apply the relocation standards as described above and evaluate actual relocation quantities and costs. There are extensive water lines and geo-thermal lines within the existing right-of-way that are anticipated to require relocation or protection. Based on approximate GIS information and field observations, preliminary estimates of the relocation quantities have been accomplished and are included in the current cost estimates.

As the project moves forward and more detailed base mapping is available, clear standards are established and franchise agreements reviewed, a more detailed and accurate estimate of utility costs can be accomplished.

Traffic Signals and Operation:

A thorough evaluation of the existing signalized intersections has not been accomplished, however, no ”fatal flaws” for traffic signals and operation were found during the feasibility study. Further evaluation will be needed to identify the extent of modifications required to the existing traffic signal infrastructure.

The conceptual cost estimate includes an allowance for typical traffic signal modifications anticipated and experienced for similar projects. The following are areas that, through additional refinement, could have an influence on the scope and cost of the project.

- Type of operation and Transit Signal Priority (TSP) that may be needed (i.e. Vtag, Opticom, etc.). The type of operation and priority (if any) that is chosen will influence the equipment required and capital cost. Given the low traffic volumes along the alignment, limited or no priority is likely to be required except where the streetcar requires an exclusive phase as indicated in the plan set. A detailed traffic analysis will need to be accomplished to establish the appropriate streetcar/traffic operations.
- Signal and OCS interface: Per the NESC (National Electric Safety Code) a minimum of 5ft clearance is required around the trolley wire. In addition, non-OSHA qualified personal are not allowed to be with-in 10 feet of a live trolley wire. Due to these standards, all signal heads with-in 10ft of the trolley wire will have to be relocated (i.e. no signal head over streetcar lane) or maintenance staff will have to trained and certified to be with-in the 10ft clear zone. This will require modifications to existing mast arms and signal head placement. Also, to minimize the number of poles and reduce cost, join-use poles (i.e. traffic/OCS) should be considered wherever feasible.

General Access/Driveways:

In General driveways do not pose a significant hazard to the safety and operations of the streetcar and should, in most cases, be able to be maintained. As the design progresses it will be appropriate to evaluate each driveway along the alignment and either consolidate where possible or select an alternate streetcar stop location (where in conflict). Through a preliminary screening the following existing driveways have been flagged for potential mitigation.

- 1st street mid-block: This is at the terminus station. If the station needs to accommodate two streetcar vehicles, the driveway may need to be closed or relocated.
- 1st & Main Ronald McDonald Bldg. Driveway: Given the close proximity to the intersection, it may be desirable to realign this driveway or make it one-way entrance only.
- West of 1st on Idaho two driveways on the north side should be evaluated due to the proximity to the intersection and vicinity of the streetcar alignment operating on an exclusive signal phase. Possible consolidation of the two driveways should be considered.
- East of 3rd street along the south side of Main: This driveway may conflict with the proposed future streetcar station.

Bike Circulation:

A bike lane currently exists along the Bannock Street alignment between 13th and 10th. Designs have been identified to accommodate both cyclists and streetcars in the same right-of-way, however, rerouting the cyclists to a different street would minimize the potential for cyclists to inadvertently engage the flageway. This would also simplify the design and minimize conflicts between cyclists and streetcar users at a proposed streetcar stop located between 10th and 11th streets.

Water Canal:

The Bannock option will cross the water cannel two times and run parallel for one block along Idaho street between 12th-13th. The crossings will occur at 13th Street on Idaho Street and mid-block between 13th and 14th on Bannock Street. An allowance for improvements to the canal crossings was included in the cost estimate, however additional review will be required to determine the level of improvements that, if any, will be required.

Traction Power and OCS System:

There are opportunities to minimize costs with the systems elements through good planning and coordination of disciplines. For example, the OCS (trolley wire) support costs can be minimized by using as many joint poles (shared with traffic signals) as possible to reduce the required number of new OCS poles and foundations. Buildings, light poles, and other vertical supports can also potentially be used to support the OCS system and reduce costs.

Traction power will require approximately three substations. Optimizing the location to minimize the length of feeder lines and identifying sites near the alignment will be an important part of future design phases.

It should also be noted that the OCS/Traction power system is comprised of many industrial metals (i.e. copper, steel, etc.) which have recently increased in cost at a much higher rate than inflation (as much as 20% since the first of the year). It will be important to monitor these materials and adjust the cost estimates accordingly as the design progresses.

Rail/Track Structure:

There are two types of rail sections generally used for streetcar systems, “tee” rail and girder rail. Girder rail is used primarily where the track way is shared with other motorized traffic. “Tee” rail is generally used when the trackway is in exclusive or semi-exclusive right-of-way. Both are suitable for embedded track and could be considered for this project. For the purpose of the estimate it was assumed the more expensive girder rail would be used.

Many types of embedded track structures are currently in use for streetcars around the country and could be considered for the Boise streetcar. There are many factors to weigh which drive the track structure design including the type of agreements made with the utility companies (both public/private). It will be important to work through agreements early in the design process as they will influence the design and cost.

In Portland, as part of the agreement with the water bureau, the track structure is required to be heavily reinforced and designed to span utility trenches while maintaining streetcar operations. In other cities such as Pittsburg (SEPTA), the track slab is completely unreinforced and alternative construction methods are used for utility crossings under the tracks. Both types of track structure accommodate streetcar loads with the unreinforced slab having a significantly lower capitol cost. For the purpose of the feasibility study, it was assumed that the more expensive reinforced track slab would be used.

Similar to the OCS/traction power discussion, material costs of the rail and track slab reinforcing has significantly out-paced inflation. In addition, the declining value of the US dollar is having an influence on the costs of products such as girder rail which are only available from overseas markets.

Stations:

The station locations shown in Volume 2 of the conceptual design report were used to establish spacing and serve as the basis of developing an operations plan. The following is a brief discussion of the current stop locations.

1st Street (Terminus):

- Mid-block driveway may need to be closed or relocated to accommodate longer terminus platform and dwell area if 2 streetcar vehicles need to be accommodated.
- It is 17’ from back of sidewalk to face of curb. Sidewalk is 7’ wide; landscape area between sidewalk and curb is 10’ wide. The landscaping will have to be reconfigured for this station.

1st Street (looking north)

3rd/Main Street:

- The mid-block parking lot driveway may need to be relocated.
- The south lane is approximately 30’ wide; which could be narrowed to increase capacity on the adjacent parking lot. A 10’ wide landscape area starts mid-block, narrowing the south lane from 30’ to 12’.
- The sidewalk adjacent to the station is approximately 7’ wide with open access.

3rd/Main Far-side (looking east)

3rd/Idaho Street:

- This station is placed far-side to allow driver right turns onto N 3rd St during streetcar stops.
- A 10’ landscape area between the sidewalk and platform will have to be modified to accommodate the station.

3rd/Idaho Far-side (looking west)

6^th^/Main Street:

- This station is placed far-side to allow driver right turns onto N 6th St during streetcar stops.
- Nearby building access will be unaffected by this station location.
- The sidewalk is approximately 16’ wide, which will occupy existing parking at the station to provide adequate space for waiting riders.

6th/Main Near-side (looking east)

6th/Idaho Street:

- This station is placed near-side to allow driver right turns from N 6th St onto Idaho St during streetcar stops.
- There is approximately 24’ from building front to the nearest track slab providing enough room to accommodate building access and streetcar loading needs.

6th/Idaho Near-side (looking west)

8th/Main Street:

- If this station shares the bus only lane the streetcar will likely share a bus stop.
- The platform is placed near-side due to the parking lot driveway on the far-side of 8th St.
- If the bus lane is replaced with parking the platform will occupy the parking lane leaving the sidewalk at 16’ wide.

8th/Main Near-side (looking east)

8th/Idaho Street:

- If this station shares the bus only lane the streetcar will likely share a bus stop.
- A far-side platform can be used if the bus lane is retained.
- If the bus lane is replaced with parking the platform will occupy the parking lane leaving the sidewalk at 16' wide.

8th/Idaho Near-side (looking west)

10th/Idaho Street:

- This station is placed far-side to service the future multimodal Center and allow right turns onto N 10th St.
- The sidewalk is wide enough to accommodate nearby building access and streetcar platform needs.
- The existing sidewalk is 16'; the platform will occupy the existing parking lane.

10th/Idaho Far-side (looking west)

10th/Bannock Street:

- This station is placed near-side to service the future multimodal Center.
- If the bike lane stays on Bannock St the station and sidewalk will be separated by the bike lane.
- Combined with a Streetcar right turn and a pedestrian island the existing sidewalk will need to be extensively reconfigured.

10th/Bannock Near-side (looking west)

13th/Idaho Street:

- This station is placed far side to allow right turn during Streetcar stops.
- The existing parking will be used for a shared platform/sidewalk.
- The landscape will have to removed/reconfigured to accommodate this station.

13th/Idaho Far-side (looking west)

13th/Bannock Street:

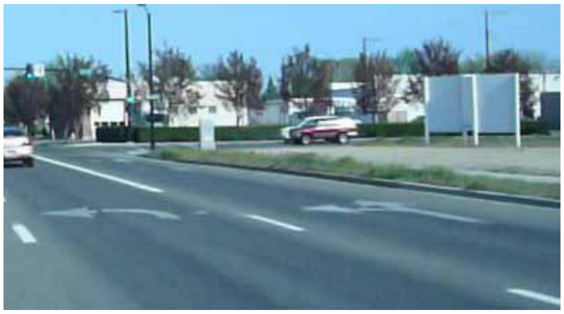
- Placing this station far-side would create a conflict with the existing bicycle lane that begins at 13th, running east along Bannock St.
- The near-side placement also avoids driveway conflicts.
- This station will service parking lots to the north and east.
- The landscape area adjacent to the station will have to be reconfigured to accommodate the platform and eliminate impact to nearby building access.
- This station is placed near-side to avoid the existing bike lane that begins on the east side of 13th St. *(See Photo)*

Far-side at 13th/Bannock (looking east)

Near-side at 13th/Bannock (Looking west)

16th/Idaho Street:

- A near-side station was chosen due to commercial driveway conflicts on the far-side of the intersection.
- A far-side station would conflict with existing driveways, but would create lower traffic impacts.



16th/Idaho Near-side (looking west)

16th/Bannock Street:

- A far-side station will occupy parking eliminating sidewalk impacts.
- The far-side location allows right turns onto 16th St during streetcar stops.
- This station will service nearby neighborhoods and the parking lot adjacent to the platform reducing parking impacts to nearby merchants.

16th/Bannock Far-side (looking east)

Treasure Valley High-Capacity Transit Study

Downtown Boise Circulator

Streetcar Option
Main/Idaho/Bannock Alignment

Traffic/Transportation Technical Memorandum

August 2008

Prepared for:

Valley Regional Transit
Community Planning Association of Southwest Idaho

Prepared by:

URS Corporation

Selection of the Main/Idaho/Bannock couplet alignment option ("the alignment") for the downtown Boise Circulator streetcar clears the way for the design to advance. Traffic operational concerns are one of many issues to be identified and addressed as the circulator design progresses. This memorandum summarizes the existing transportation system serving the alignment, identifies modifications to existing transportation facilities needed to accommodate the streetcar, and describes locations where traffic operations are expected to require further detailed analysis as the project moves ahead.

Existing Street Characteristics and Potential Alignment Impacts

Tables 1 and 2 summarize physical features and traffic volumes for the three east-west streets in the Main/Idaho/Bannock alignment (Bannock Street, Idaho Street and Main Street), as well as major north/south streets crossing the alignment: N Capitol Blvd., N 9th Street, N 13th Street, N 15th Street and N 16th Street. N 10th Street is also included, which would accommodate the streetcar alignment across the westbound Idaho Street segment to connect eastbound circulator segments on Bannock Street and Main Street. N 15th Street would also serve as the northbound return leg of a 16th Street/15th Street circulator loop linking the mainline to a potential maintenance facility between Grove Street and Front Street.

Mixed Flow and Exclusive Lanes

Through most of the alignment, the streetcar would operate in mixed traffic, to minimize on-street parking loss. Mixed traffic would have a modest reduction in the lane's vehicle capacity, while a dedicated streetcar lane would require the remaining lanes to accommodate total vehicle travel demand. (Appendix A shows photos of existing parking configurations at various locations along the Main/Idaho/Bannock alignment, including segments where the alignment would utilize mixed-flow lanes to retain existing on-street parking). As shown in Table 2, peak hour volumes on both W Main Street and W Idaho Street are less than 1,000 vehicles today. Given that the 2004 *Boise Mobility Study* found downtown intersections along and in the immediate vicinity of the alignment to operate at "level of service" A or B, a slight capacity reduction in the mixed flow lane would be accommodated by the remaining lanes. Considering *person-trip* capacity, the mixed flow lanes represent an increase in capacity compared to a lane used only by vehicle traffic.

Dedicated streetcar lanes are proposed in two short segments. Both are at the east end, where the dedicated lane would replace street frontage currently available for on-street parking. No vehicles were observed actually parked in either segment during limited field reconnaissance. The segments include the eastern 200 feet of W Main Street between 2nd Street and 1st Street (about 8 spaces), and the N 1st Street for the block between Main Street and Idaho Street (about 300 feet, or 12 spaces).

A third segment – the existing transit mall on Main and Idaho Streets between N 9th Street and N Capitol Boulevard – could also have an exclusive streetcar lane. Two design options have been prepared for this two-block segment and are shown in Appendix B. In Design Option A, the streetcar would operate in mixed traffic in the existing outside travel lane on both Main and Idaho Streets. On-street parking could be provided along both sides of Main and Idaho Streets, which would add about 80-85 on-street parking spaces in the two blocks of the existing transit mall. (No on-street parking exists in the transit mall blocks today). With Design Option B, an exclusive streetcar right-of-way would be provided in the currently designated bus lane.

Table 1: Study Area Roadway Characteristics

Street Name and Flow Type	2030 Ada Co Classification	# Thru Lanes	Sidewalks	Bike Lane	On-Street Parking
W Main Street *1-way EB*	Principal Arterial	3 [a]	Both sides	No	Both sides
W Idaho Street *1-way WB*	Principal Arterial	3 [a]	Both sides	No	Both sides
W Bannock Street *2-way*	Urban Collector	1	Both sides	Both sides east of 13th Street	Both sides [b]
N Capitol Blvd *1-way NB*	Principal Arterial	2	Both sides	No	East curb between Idaho and Bannock)
N 9th Street *1-way SB*	Principal Arterial	3	Both sides	East side only (NB)	Both sides
N 10th Street *2-way*	Urban Collector	2 *(1 each way)* [d]	Both sides	Both sides	Both sides
N 13th Street *1-way NB*	Urban Collector	2	Both sides	No	Both sides
N 15th Street *1-way NB*	Principal Arterial	2	Both sides	East side only (NB)	Both sides
N 16th Street *1-way SB*	Principal Arterial	2-4 [c]	Both sides	No	No

[a] Between 9th Street and Capitol Blvd. the 4th lane is a transit-only lane, with no on-street parking.
[b] On-street is prohibited along the Plaza frontage (on the north side between 11th Street and 12th Street).
[c] N 16th Street has two lanes north of Bannock Street, three lanes between Bannock Street and Idaho Street, and four lanes from Idaho Street to Main Street. At Main Street two lanes continue south as S 16th Street and two lanes veer to the right and become the westbound leg of the W Main Street/W Fairview Avenue one-way couplet. (Main Street is 1-way eastbound east of N 16th Street.)
[d] West side on-street parking on N 10th St becomes a southbound right turn lane in the last 50-75 ft approaching W Idaho.

Streetcar Alignment Intersection Traffic Control Changes

This section summarizes intersection traffic control changes to accommodate the streetcar alignment, including new signals and modifications at existing signals needed to accommodate the streetcar. Some of the modifications would simply be signal pole changes to provide vertical clearance for the streetcar. At other intersections the existing signal controller would need to be modified or replaced to provide a transit-only, or "queue jump" phase. Transit-only phases are needed only where the alignment transitions from an exclusive streetcar lane to a mixed traffic lane, to avoid drivers merging with the streetcar.

Existing stop-sign control will remain in place at several lightly-traveled intersections, including Bannock Street at N 14th Street and N 12th Street, Idaho Street at N 4th Street, N 3rd Street and N 2nd Street, and Main Street at N 4th Street and N 2nd Street. Stop signs at these intersections may need to be augmented with supplementary flashing red lights or supplementary signage directing drivers to look both ways.

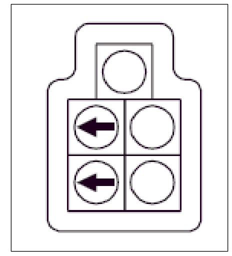
Table 2
Recent Daily/PM Peak Hour Traffic Counts - Downtown Boise

Street	Count Location	Direction	Daily Volume	Peak Hour Volume			
				AM (7-8)	% Daily	PM (5-6)	% Daily
East-West Streets							
W Main St *1-way EB*	w/o 11th St	EB	10,377	862	8.3%	666	6.4%
	e/o 11th St	EB	10,789	983	9.1%	703	6.5%
W Idaho St *1-way WB*	e/o 11th St	WB	7,323	253	3.5%	829	11.3%
	e/o 12th St	WB	7,635	214	2.8%	864	11.3%
	w/o 9th St	WB	9,426	382	4.1%	842	8.9%
W Bannock St *2-way*	e/o 11th St	EB	4,043 (2-way)	205	2.5%	161	2.0%
		WB		40	0.5%	157	1.9%
	e/o 12th St	EB	3,315 (2-way)	203	3.1%	121	1.8%
		WB		40	0.6%	160	2.4%
North-South Streets							
N 16th St *1-way SB*	n/o Bannock St	SB	10,367	927	8.9%	850	8.2%
	n/o Idaho St	SB	10,239	844	8.2%	879	8.6%
	s/o Idaho St	SB	14,896	1,029	6.9%	1,437	9.6%
N 15th St *1-way NB*	n/o Idaho St	NB	8,274	424	5.1%	688	8.3%
	s/o Idaho St	NB	7,880	424	5.4%	808	10.3%
N 13th St *1-way NB*	n/o Bannock St	NB	2,955	180	6.1%	308	10.4%
	n/o Idaho St	NB	3,532	226	6.4%	229	6.5%
	s/o Idaho St	NB	3,972	348	8.8%	282	7.1%
N 10th St *2-way*	n/o Main St	NB	3,381 (2-way)	68	1.0%	99	1.5%
		SB		91	1.3%	179	2.6%
	n/o Idaho St	NB	3,822 (2-way)	88	1.2%	192	2.5%
		SB		76	1.0%	159	2.1%
	n/o Bannock St	NB	2,704 (2-way)	49	0.9%	131	2.4%
		SB		100	1.8%	120	2.2%
N Capitol Blvd *1-way NB*	n/o Idaho St	NB	10,095	624	6.2%	826	8.2%
	s/o Idaho St	NB	13,415	738	5.5%	1,091	8.1%
N 9th St *1-way SB*	n/o Idaho St	SB	13,333	852	6.4%	1,051	7.9%
	s/o Idaho St	SB	15,924	956	6.0%	1,319	8.3%
	n/o Bannock St	SB	11,728	847	7.2%	886	7.6%

Source: Ada County Highway District online database, 2006-2008 traffic counts

Six far-side stops are planned. Final design should evaluate the potential for vehicle queues to form behind the streetcar that would extend into the adjacent intersection. Measures to address this concern include regulatory signage at stop-controlled intersections (e.g., “Do Not Block Intersection”) or a “doghouse” type signal providing a separate transit phase. The term “doghouse” signal refers to the type of signal face typically used for protected-permissive signal phasing, with four displays under the red ball: green and yellow arrow displays for the protected phase, and green and yellow round displays for the permissive phase. For the streetcar the protected arrow displays would be replaced with streetcar symbols.

New Traffic Signals



Four new signals are planned, all in the west end of the alignment. Their operation is summarized below.

- Idaho Street/N 17th Street – The northbound and southbound approaches on N 17th Street are stop-controlled today at this intersection. The main truck entrance for the Meadow Gold Dairy is about 25 feet east of N 17th Street on the north side of Idaho Street. Due to truck traffic, an activated warning device should be considered at this driveway. A detailed review should be conducted at this location to determine if traffic control methods other than signalization can be utilized.
- Bannock Street/N 17th Street – The eastbound/westbound Bannock Street approaches are stop-controlled. A similar pedestrian median island would be provided outside the streetcar track to accommodate the streetcar right turn radius. A detailed review should be conducted at this location to determine if traffic control methods other than signalization can be utilized.
- Bannock Street/N 16th Street – Stop signs control east/west traffic on Bannock Street at this intersection, where a far-side streetcar stop is planned. Final design should evaluate the potential for vehicle queues forming when the streetcar blocks N 16th Street. Measures to address this concern include regulatory signage (e.g., "Do Not Block Intersection") or a "doghouse" type signal providing a separate transit phase.
- Bannock Street/N 15th Street – Eastbound/westbound Bannock Street approaches are stop-controlled. A doghouse signal would only be needed here if the eastbound left turn volume from Bannock Street onto N 15th Street is particularly high, which is not likely.

Modified Traffic Signals

Another 24 intersections would require existing traffic signals to be modified. Modifications that would include a designated transit "queue jump" phase are identified with a (T) on the concept design plan set. Transit phases would be necessary only at intersections where the streetcar would shift from an exclusive lane on the near side of the intersection to a shared lane on the far side, or where the streetcar would turn left across through lanes in the same direction.

Intersections where a far-side station warrants further analysis of potential queuing to block the intersection are noted with an asterisk (*). As noted above, the need for additional regulatory signage at these intersections should be considered in final design.

- Idaho Street/N 16th Street
- Idaho Street/N 15th Street
- Idaho Street/N 14th Street
- Idaho Street/N 13th Street*

- Idaho Street/N 12th Street
- Idaho Street/N 11th Street
- Idaho Street/N 10th Street*
- Idaho Street/N 9th Street (T)
- Idaho Street/ N 8th Street (T)
- Idaho Street/ N Capitol Boulevard (T)
- Idaho Street/ N 6th Street
- Idaho Street/ N 5th Street
- Idaho Street/ N 1st Street (T)
- Bannock Street/N 13th Street
- Bannock Street/N 11th Street
- Bannock Street/N 10th Street
- Main Street/N 10th Street**
- Main Street/N 9th Street
- Main Street/N 8th Street
- Main Street/N Capitol Boulevard (T)
- Main Street/N 6th Street*
- Main Street/N 5th Street
- Main Street/N 3rd Street
- Main Street/N 1st Street

** Streetcars would make a southbound left turn onto Main Street at N 10th Street, crossing opposing northbound traffic. The signal modification here is likely to be either an entirely new “doghouse” signal with a designated transit phase, or revised split-phase timing with northbound and southbound traffic moving in separate phases.

APPENDIX A

Photolog of Existing Facilities along Circulator Route

Photos along Main/Idaho/Bannock Alignment - Counterclockwise from East End
(*Traffic flow for circulator alignment at photo location is listed in parentheses)*


2-way 1st St. north of Main approaching Idaho (*northbound dedicated lane; pkg removed*)


Idaho west of 2nd approaching 3rd (*westbound mixed traffic; parking remains*)


Idaho west of 13th approaching 14th (*westbound mixed traffic; parking remains*)

Idaho west of 15th approaching 16th (*westbound mixed traffic; parking remains*)

17th north of Idaho approaching Bannock (*northbound mixed traffic; parking remains*)

Bannock east of 12th St. approaching 11th (*eastbound mixed traffic; parking and bike lane remain*)

10th at Idaho facing north (*southbound mixed traffic; parking remains)*

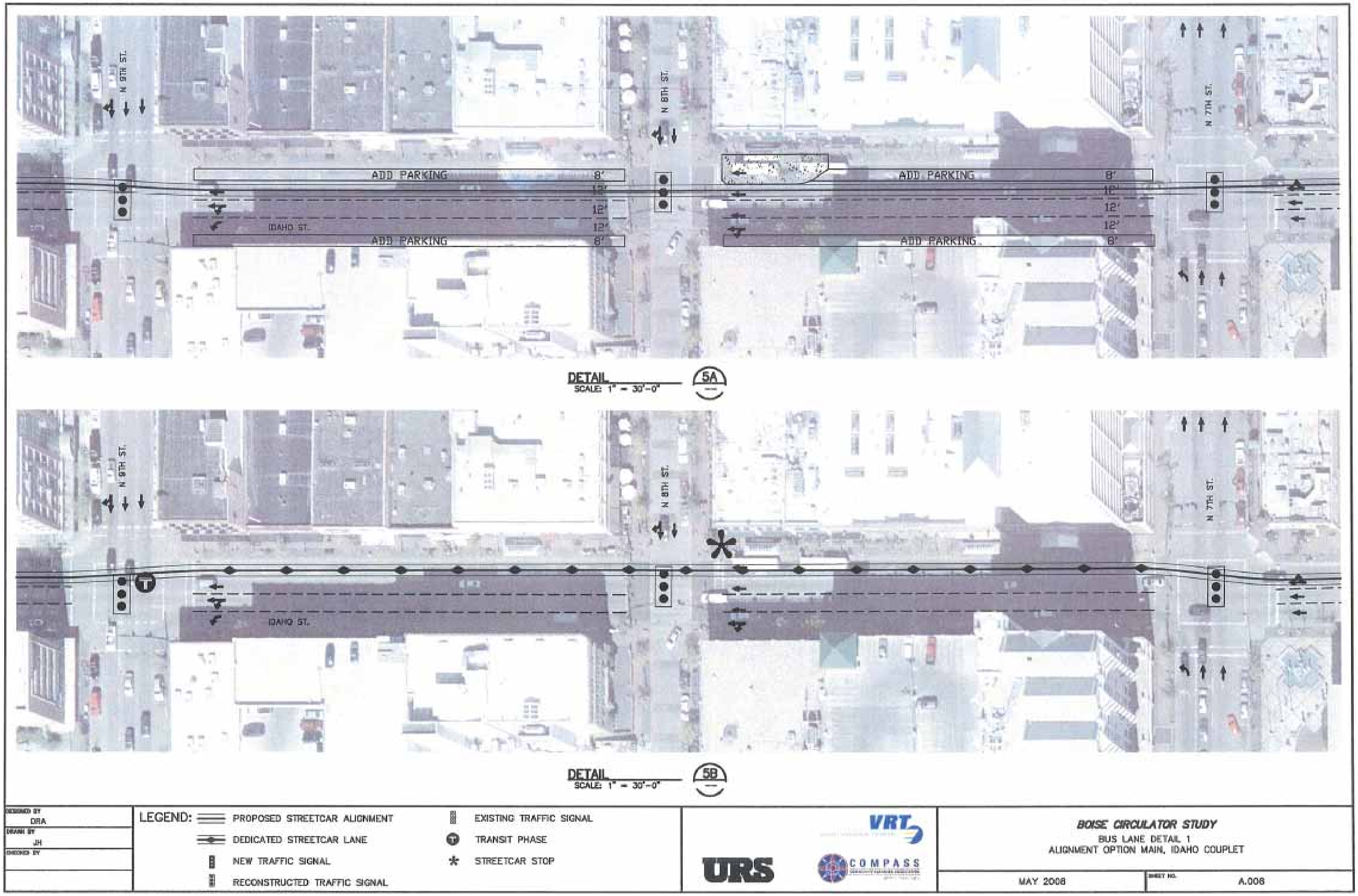

10th from Main facing north (*southbound mixed traffic; parking remains)*

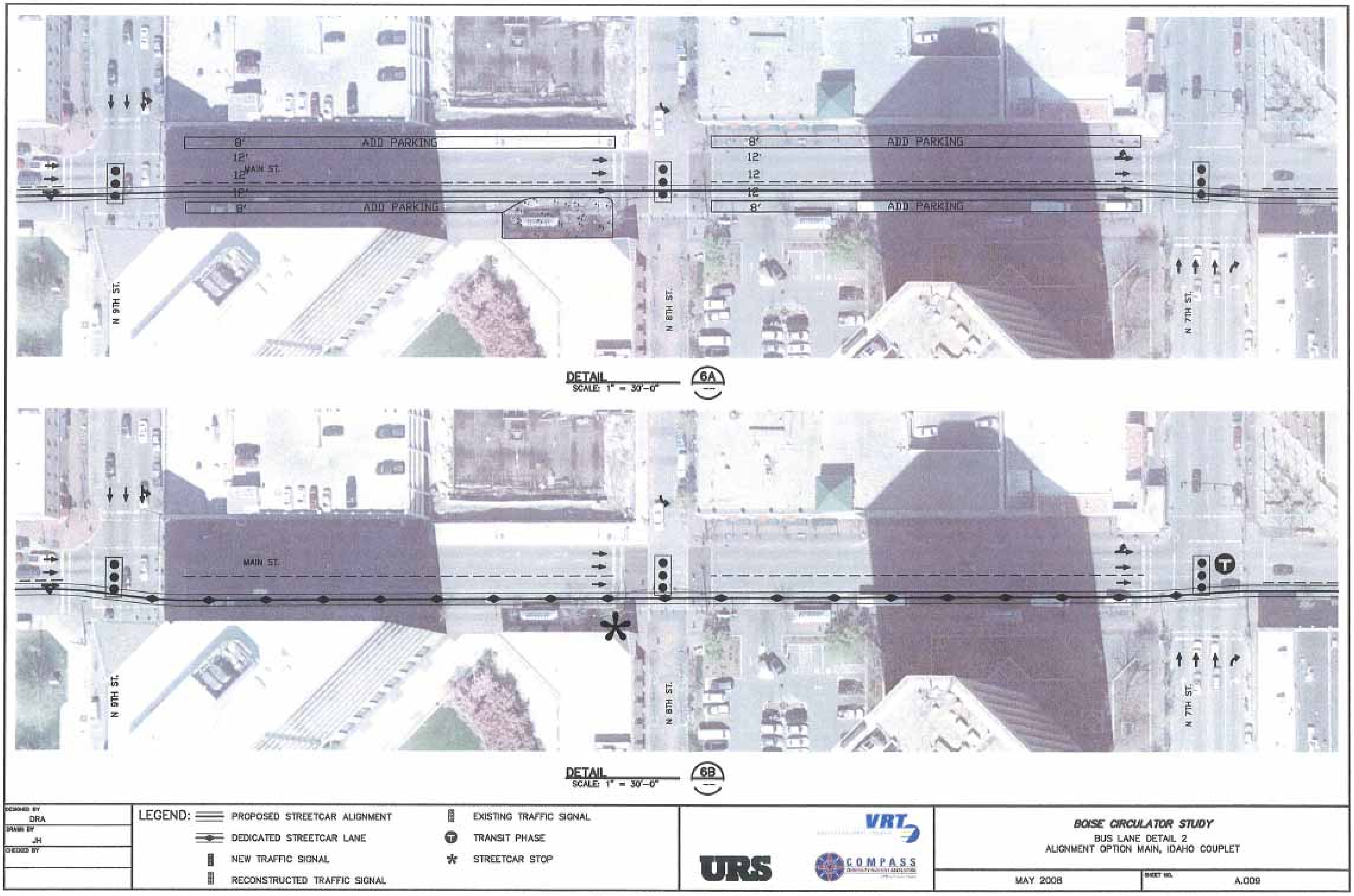

Main east of 8th Street approaching Capitol (*eastbound mixed transit lane for bus and streetcar; three lanes remain for vehicular traffic*)


Main east of 3rd approaching 2nd (*eastbound mixed traffic; parking remains*)

APPENDIX B

Design Options for Existing Transit Mall Segment


N 9TH ST.
N 8TH ST.
N 7TH ST.
ADD PARKING
ADD PARKING
ADD PARKING
ADD PARKING
8'
12'
12'
12'
8'
IDAHO ST.
DETAIL 5A
SCALE: 1" = 30'-0"
DETAIL 5B
SCALE: 1" = 30'-0"
DESIGNED BY DRA
DRAWN BY JH
CHECKED BY
LEGEND:
PROPOSED STREETCAR ALIGNMENT
DEDICATED STREETCAR LANE
NEW TRAFFIC SIGNAL
RECONSTRUCTED TRAFFIC SIGNAL
EXISTING TRAFFIC SIGNAL
TRANSIT PHASE
STREETCAR STOP
VRT
URS
COMPASS
BOISE CIRCULATOR STUDY
BUS LANE DETAIL 1
ALIGNMENT OPTION MAIN, IDAHO COUPLET
MAY 2008
SHEET NO. A.008


8'
ADD PARKING
12'
MAIN ST.
12'
12
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8'
N 9TH ST.
N 8TH ST.
N 7TH ST.
DETAIL
SCALE: 1" = 30'-0"
6A
MAIN ST.
DETAIL
SCALE: 1" = 30'-0"
6B
DESIGNED BY
DRA
DRAWN BY
JH
CHECKED BY
LEGEND:
PROPOSED STREETCAR ALIGNMENT
DEDICATED STREETCAR LANE
NEW TRAFFIC SIGNAL
RECONSTRUCTED TRAFFIC SIGNAL
EXISTING TRAFFIC SIGNAL
TRANSIT PHASE
STREETCAR STOP
VRT
URS
COMPASS
BOISE CIRCULATOR STUDY
BUS LANE DETAIL 2
ALIGNMENT OPTION MAIN, IDAHO COUPLET
MAY 2008
SHEET NO.
A.009

Treasure Valley High-Capacity Transit Study

Downtown Boise Circulator

Streetcar Option

Environmental Review

Technical Memorandum

August 2008

Prepared for:

Valley Regional Transit
Community Planning Association of Southwest Idaho

Prepared by:

URS Corporation

1. Introduction

General Project Description

The proposed Boise Downtown Streetcar Circulator Project would be a new transit alignment located within the highly urbanized portion of the city. It would be generally located within existing public right-of-way as shown on attached the attached *Figure 1: Boise Circulator (Streetcar Option)*.

Overview of Environmental Issues and Approach

This environmental reconnaissance is intended to be an initial scan of potential issues that may be necessary to evaluate further as the project development process moves forward. It also serves to identify features that must be kept in mind during subsequent design phases. Because the Streetcar Project is expected to move forward as a locally funded project (without FTA or other federal funds) it is not expected at this time that a full National Environmental Policy Act (NEPA) (and related federal environmental and transportation criteria evaluation) would be required for the project. Following is an overview and discussion of some of specific environmental topic areas that could be of interest related to the project.

2. Noise and Vibration

Noise and vibration issues are often a topic of public interest and sometimes concern in an area where a new type of transit technology is proposed. Significant noise and vibration impacts are not expected to be an issue with the Streetcar Project because:

A. There are few sensitive noise receptors in the immediate vicinity of the proposed project. *Figure 2: Boise Circulator (Streetcar Option): Potential Sensitive Noise Receptors* shows the location of potentially sensitive noise receptors in the downtown area.
B. The existing ambient noise level in the vicinity of the proposed alignment is relatively high because of the urban nature of the surrounding land uses, and there is significant existing noise from auto and freight traffic within the street right-of-way that would be utilized for the project.
C. Streetcars are relatively light (compared to light rail transit vehicles) and are operated at relatively low speeds, resulting in relatively low vibration levels.
D. The typical construction method used for streetcars includes construction of a new concrete slab that would be structurally-isolated from the existing pavement and a rubber boot is typically used to encompass the streetcar rails, thereby reducing transmitted vibration and noise.

Rail based transit vehicles tend to have higher noise levels at locations with tight radius turns that is attributed to “wheel squeal.” Locations that could require special attention and possible application of special mitigation during the design phase are located at 1st Street at Main and Idaho, and at 17th Street at Idaho and Bannock.

3. Historic Properties

The Idaho SHPO was contacted to help identify known historic resources within the project vicinity. Because this project is expected to be funded locally, a full Section 106 historic analysis is not anticipated.

Within downtown Boise, there are a number of resources that are on the National Register of Historic Places or potentially eligible for the National Register. The historic properties that have been identified are shown on *Figure 3: Boise Circulator (Streetcar Option): Historic Resources*. Because the proposed project would be constructed almost entirely within the existing public right-of-way, it is not expected that the project would have any adverse impacts on, or use property from, any known historic resource. A secondary issue relative to historic resources can be the location and design of streetcar stops when located adjacent to known historic resources. The current circulator plan does not propose to locate any station platforms in front of identified historic resources. However, as the project evolves to a more detailed level of design, it will be important to keep in mind the relationship of the project to these resources and be sensitive in the design to ensure compatibility with these resources.

4. Parking

Existing on-street parking could be affected by the proposed circulator project. Existing on-street parking in the area includes of a mixture of metered and non-metered parking and loading zones. The loss of on-street parking can be an issue of concern to local businesses or other adjacent property owners when a project such as the Boise Downtown Circulator is constructed. The most typical location where parking loss could occur includes areas where station platforms are proposed and where turning movements dictate removal of parking spaces. Depending on the design of the station platforms and the existing configuration of street cross sections and parking, some on-street parking loss is likely to occur in the vicinity of station platforms. *Figure 4: Boise Streetcar (Streetcar Option): Potential Parking Impacts* shows the locations where parking loss is likely to occur. The number of spaces likely to be affected and configuration of the changes will be further defined when the project design is refined. Project designers will need to work closely with adjacent property owners and businesses to refine the design while being sensitive to the parking needs of the local property owners. The loss of on-street parking would be mitigated to some extent by the increased public access afforded by the station platform.

5. Access Conflicts

Direct access to property, loading and parking areas from the street right-of-way is typical for many businesses in downtown Boise. Driveways crossing the proposed trackway can be accommodated; however each must be assessed in terms of potential safety issues. A preliminary identification of direct property access points has been done for the Streetcar alignment. *Figure 5: Boise Circulator (Streetcar Option): Potential Access Conflicts* shows the locations of identified private property access points that would need to cross the project alignment. Further examination of these locations will work to identify design solutions to any possible safety concerns, or conflicts with possible stop locations.

6. Construction Issues

Construction of the Streetcar line will be done primarily within the public right-of-way. Construction activities are typically short-term in nature, compared to the longer-term effects of the project transit operations. The actual approach to construction will be determined in more detail as the plans for the project are refined. The purpose of this section is to provide a brief overview of the typical types of issues that arise during construction and some typical ways to minimize them. All construction would be subject to City of Boise and Ada County Highway District requirements and approvals.

The major elements to be constructed would include the trackway and traffic lane improvements, station platforms, adjacent sidewalk connections and improvements, operations and maintenance facility, related signals and electrification. Construction activities would likely be done in segments to reduce the overall time of construction in any one area, and reduce the impacts to adjacent property owners. Generally most required utility work would precede the project related construction. Below is a brief discussion of some typical construction related issues by topic:

<u>Traffic and Parking</u> – Some traffic lanes would be closed to general purpose traffic and freight use during construction. Also, access to parking between the proposed trackway and sidewalks would be temporarily unavailable during construction. Most construction would occur in the traffic lanes where the trackway would be located and in the adjacent on-street parking areas; however, some additional lanes may be temporarily blocked for utility work and other related construction. Intersections crossed by the project could require temporary or partial closures. Where project construction crosses intersections, construction could be done on one-half of the intersection at a time to avoid complete closure of the intersections. The overall intent would be to build in short segments and limit the duration any one block is impacted by construction.

<u>Access</u> – Construction activities within the public right-of-way can disrupt either pedestrian or auto access to adjacent properties or businesses. Streetcar project construction normally reduces access to adjoining properties for short periods but does not completely eliminate access. The project could employ typical construction management practices to avoid and minimize adverse economic consequences to businesses, such as avoiding full access closures, providing temporary alternative access and signage, along with timely coordination with business owners.

<u>Utilities</u> – Prior to the initiation of project road and track construction, work related to improving or relocating utilities is completed. Utility relocation and construction is typically done by the utility providers or contractors. Further identification of the locations of existing utilities and any changes that would be required would occur as the design of the project moves forward.

<u>Air Quality</u> – Construction activities typically temporarily create dust and could result in emissions from construction equipment. Construction contractors would be required to use reasonable measures to control dust, such as applying water or other dust suppressants during dry weather.

Noise and Vibration – During construction there would be temporary increases in noise and vibration near the active areas of construction and near any staging areas. Construction activities would generally occur during weekday daytime hours. The project would be required to comply with local noise requirements. Because construction in any one location would likely last only a few weeks, any construction related noise or vibration would be temporary and would not be considered a significant adverse noise impact.

Water Resources – Construction effects on water quality would be negligible. Construction will likely be limited to a few blocks of unpaved and open to erosive forces at any one time. The project will employ “best management practices” to manage potential erosion or site runoff during construction.

Hazardous Materials – The project is not expected to result in the exposure of any know hazardous materials and would use pre-acquisition hazardous materials examinations for all land acquisitions. Soil could be monitored during construction in any area where there might be potential for concern.

Attachments:

Figure 1: Boise Circulator (Streetcar Option): Main/Idaho, Idaho/Bannock Couplet Route
Figure 2: Boise Circulator (Streetcar Option): Potential Sensitive Noise Receptors
Figure 3: Boise Circulator (Streetcar Option): Potentially Historic Properties
Figure 4: Boise Circulator (Streetcar Option): Potential Parking Impacts
Figure 5: Boise Circulator (Streetcar Option): Potential Access Conflicts

Treasure Valley High-Capacity Transit Study

Downtown Boise Circulator

Mode Assessment

Technical Memorandum

August 2008

Prepared for:

Valley Regional Transit
Community Planning Association of Southwest Idaho

Prepared by:

URS Corporation

MODE ASSESSMENT: BUSES AND STREETCARS

The purpose of this mode assessment memorandum is to identify and review the wide range of vehicle types (mode) that could be considered for use in the circulator function for Downtown Boise. Each vehicle type comes with their own set of characteristics, advantages and disadvantages. For the purposes of this study, this review will focus on two modes: rubber-tired vehicles (buses and “guided light transit”) and streetcars. The following transit types will be reviewed:

Buses

- Vintage-styled, non-electric trolley buses
- Low-floor buses
- “Guided light transit” buses (GLT)

Streetcars

- Vintage streetcars
- Replica streetcars
- PCC streetcars
- Modern streetcars

REPRESENTATIVE CIRCULATOR SYSTEMS

Numerous communities across the United States have initiated central city circulator systems in order to achieve goals similar to those outlined for the Downtown Boise Circulator. Whether complementing the existing transit system, providing easier connections between downtown housing, downtown employment sites and activity centers, and reducing auto trips to and within the central business district, and attracting tourist activities, many circulator services across the country have achieved the objectives established for them.

In addition to the circulator services listed in Table 1, several additional examples exist of circulators in smaller communities like Park City, UT, and Monrovia, CA, and privately-operated tourist shuttles in cities like Boston, Chicago and San Diego. The private sector usually provides these circulator/shuttle services when they are connected to tourist facilities that are significant in number or scale. A key difference for privately-operated shuttles is that they typically provide a tourist/entertainment component. Very few fixed-guideway transit systems are operated by private entities; the monorail systems in Las Vegas and at Disney resorts are examples.

Figures 1 and 2: DC Circulator showing coordinated brand elements including bus graphics, stop information and shelter advertising - Washington, DC

For both bus- and rail-based circulator systems, the systems that have experienced the greatest success in terms of sustained ridership have had the following characteristics:

- Frequent service
- Specially distinguished or unique vehicles
- Unique and clearly identified stops
- A separate identity from the remainder of the transit system
- Simple and easy to understand routing
- Extended service hours

Table 1 provides a representative sampling of U.S. cities that have some form rubber-tired circulator service from either low-floor buses or "vintage-styled" non-electric (diesel-powered) trolleys. There are no examples of "guided light transit" systems (GLT) operated or being constructed in the U.S. The only two operating GLT systems are located in the French cities of Caen and Nancy and they are not represented in the table. See Table 1A/1B/1C in Appendix A for more detailed characteristics of the bus circulators listed in Table 1.

Table 1
Representative Sample of U.S. Bus Circulator Systems

City	Service	Low-floor bus	Vintage-styled, non-electric trolley	Guided Light Transit	Other bus transit
Austin, TX	Dillo		x		x
Chattanooga, TN	Downtown Electric Shuttle	x			x
Denver, CO	FREE MallRide	x			x
Los Angeles, CA	DASH	x			x
Milwaukee, WI	Milwaukee Co. Transit Trolley		x		x
Oklahoma City, OK	Oklahoma Spirit Trolley		x		x
Orlando, FL	LYMMO	x			x
Washington, DC	DC Circulator	x			x

Source: URS, July 2008

Table 2 below provides a summary of U.S. cities that have some form of vintage trolleys, PCC cars, or modern streetcars either in service or in the process of being procured.

Table 2
Survey of U.S. Streetcars in Service or in Procurement

City	Vintage Trolley		PCC	Modern Streetcar	LRV/HRT also
	Restored	Replica			
Boston, MA	x		x		x
Charlotte, NC	x	x		x[1]	x
Dallas, TX	x		x		x
Little Rock, AR		x			
Memphis, TN	x				
New Orleans, LA	x	x			
Philadelphia, PA			x		x
Portland, OR		x		x	x
San Francisco, CA	x		x	x	x
San Jose, CA	x				x
Seattle, WA	x			x	x
Tacoma, WA				x	
Tampa, FL		x			
Washington, DC				x	x

[1] Streetcar procurement not yet initiated.

CRITERIA FOR MODE ASSESSMENT

By adopting the project goal and objectives, the parameters for selecting the transit mode most appropriate for the Downtown Boise circulator have been established by the Downtown Policy Advisory Committee (DPAC). The goal of the circulator project is:

To provide a transit circulator system, highly effective in attracting and distributing trips throughout downtown Boise and approximate employment centers. To serve as a focal point for an expanded regional transit system that leverages the circulator investment to help shape the downtown and support the community vision of a downtown that is a vibrant, active and economically strong centerpiece for the region, contributing to an enhanced quality of life with a pedestrian- friendly atmosphere.

The DPAC also adopted the following circulator project objectives:

- Reflect community values and secure strong public acceptance from stakeholders such as downtown businesses, residents, property owners, commuters, transit riders, elected officials, and participating jurisdictions.
- Reduce the number of short single-occupancy auto trips occurring within downtown Boise.
- Provide a service that is frequent, convenient and easily understood by regular transit commuters as well as occasional users, visitors and tourists.
- Minimize the impacts on existing downtown development, people, cultural resources, the environment and traffic.
- Become a key component of an overall strategy to increase transit ridership to and within the downtown.
- Create a transit system that is visually attractive and compatible with pedestrian travel.
- Be closely coordinated and compatible with the investment in the Downtown Multi-Modal Center.
- Accommodate the full range of functions identified through the planning processes and recommended by the DPAC and adopted by the VRT Board of Directors.
- Support and stimulate downtown economic development including the influencing of location decisions consistent with local planning goals.
- Identify an achievable initial segment that can be expanded to a future system that supports the planned growth of the downtown and immediately adjacent employment and housing.
- Enhance urban living by connecting downtown residential housing with downtown employment and activity centers.

Each of these objectives is listed below in Table 3 and reviewed against the characteristics of each mode type.

Table 3
Downtown Boise Circulator Goals
Supported by Modes Considered

Project Goal	Bus	Bus	Bus	Streetcar	Streetcar
	Low-floor	Vintage-styled non-electric trolley	Guided Light Transit (GLT)	Vintage/ PCC	Modern
Reflect community values; secure strong public acceptance	Medium-High	Medium	Unknown	Medium	High
Reduce number of short SOV auto trips within downtown	Medium	Medium	Medium-High	Medium	Medium-High
Provide frequent, convenient, easily understood service	Yes	Yes	Yes	Yes	Yes
Minimize impacts on existing development; other resources	Lower impacts	Lower impacts	Low-medium impacts	Low-medium impacts	Low-medium impacts
Increase overall transit ridership to/within downtown	Low-Medium	Low-Medium	Medium	Low-Medium	Medium-High
Create visually attractive transit compatible with pedestrians	Yes	Yes	Yes	Yes	Yes
Be compatible and coordinated with Downtown MMC	Yes	Yes	Yes	Yes	Yes
Accommodate full range of functions identified by DPAC	Medium	Medium	Unknown	Medium	High
Stimulate downtown economic development	Low-Medium	Low-Medium	Medium-High	High	High
Identify an identifiable initial segment that can be expanded	Yes	Yes	Yes	Yes	Yes
Enhance urban living; connect housing to employment/ activity centers	Medium	Medium	Medium	Medium	Medium-High

In summary, both rubber-tired vehicles, particularly low-floor buses, and streetcars have the ability to accomplish most of the goals set out for the Downtown Boise Circulator. The "guided light transit" mode, while maintaining many of the characteristics sought for the circulator function, is unproven in North America at this time.

VEHICLES

Often, no element of a transit system captures the hearts and minds of the public more than the vehicle itself. Both the riding and non-riding public interacts with the transit vehicle more than with any other part of the transit system-- from using it to satisfy travel needs to sometimes competing with it in traffic, to recognizing it as a symbol of the transit service. In some cases, such as the cable cars in San Francisco, the vehicle can even become a defining symbol for the metropolitan area. Thus, selection of a vehicle, from the basic type of vehicle to various physical and performance characteristics to the aesthetics, is a key decision, or series of decisions, in the course of a transit project.

There are a number of mode selection parameters that influence the choice of an optimal vehicle for a circulator system. Some of these selection parameters include:

- Core concept
- Cost
- Performance characteristics
- ADA compliance and boarding configuration
- Operational configuration
- Passenger comfort features
- Design, construction and delivery schedule
- Station and stop requirements
- Traffic and parking conflicts
- Vehicle styling consistent with circulator system expectations
- Economic development and development potential

Figure 3: DC Circulator 40-foot bus - Washington, DC

Both vehicle types, buses and streetcars, provide opportunities to serve as iconic images of localities. Perhaps because of their relative permanence and a fewer number of rail-based systems across the county, rail vehicles, including streetcars, enjoy a higher degree of recognition and a higher degree of association or identity with their respective cities. However, buses with very memorable features, for example double-decker buses, show that buses have the ability to supply an iconographic image of a locale. Though perhaps not an icon of the nation's capital, the brightly-colored, thoughtfully-designed buses of the DC Circulator in Washington, DC, demonstrate that buses can be distinctive and memorable too.

CANDIDATE VEHICLES – BUSES

One option available for use as a circulator in downtown Boise is a rubber-tired vehicle. Three types of rubber-tired transit vehicles to be reviewed here are: low-floor buses; vintage-styled, non-electric trolley buses; and "guided light transit" (GLT). Numerous communities throughout North America have implemented downtown bus circulators with varying levels of success.

Many systems also are beginning to utilize vehicles that make use of alternative fuels and alternative propulsion systems including hybrid systems such as diesel-electric buses. These vehicles offer more environmentally friendly operations within downtown environments.

The advantage of the rubber-tired option for use as a circulator is that they are more easily implemented at a substantially less capital cost than rail systems. The operating costs are also somewhat lower than a comparable rail system that has the added maintenance cost of the track and overhead system. For a bus circulator system, the primary capital cost elements are the vehicles, any unique maintenance or fueling requirements, the stops, and specialty signage and

marketing. Some systems also implement traffic signal modifications to improve the efficiency of the bus operations. Rubber-tired systems are also easier to make changes to the route if circumstances dictate such a change.
The disadvantage of rubber-tired circulator systems is that in all cases in which direct comparisons are available, the fixed rail or streetcar option attracts substantially more passengers. In particular, a rail system will attract more riders who only use transit for special occasions, out of town visitors and those attending special events.

However, the primary difference between rubber-tired and rail circulator systems is the ability of streetcars, and conversely the relative inability of rubber-tired circulators, to be catalysts for attracting and shaping desired central city development. Most often cited for this distinguishing feature is the development community's recognition of the value and permanence of the public investment in a fixed rail system.

New streetcar systems in Tampa, Memphis and Portland have experienced substantial investments in mixed-use development adjacent their streetcar lines. Also, new central city streetcar systems have been successful in attracting private sector participation in the cost of such systems, something not usually experienced with bus circulator systems. Although on a significantly smaller scale, the DC Circulator in Washington, DC, is one example of a bus-based circulator system that has been able attract some funding from some private partners; however, the Circulator's success was not predicated on leveraging a sizable amount of new mixed-use development adjacent to its routes.

Low-floor Buses

Advantages:

- Low floors on transit vehicles improve access for all customers.
- Improved access also translates into lower dwell times at bus stops for boarding and exiting passengers.
- Low-floor buses are close to becoming the near-universal standard for most transit fleets; therefore agencies can enjoy the benefits of numerous suppliers, economies of scale and other transit properties having similar fleets.
- Low-floor buses are available with a vast array of sizes, door configurations and options.
- Most low-floor buses also provide large windows that many transit

Figure 4: 30-foot electric shuttle bus - Chattanooga, TN

customers, including first time riders, prefer for enabling easier viewing of their surroundings and their approaching destinations.

- These buses generally have low capital and maintenance costs relative to other transit vehicles.
- Most low-floor buses are available with low-emission technologies.

Disadvantages:

- The abundance of low-floor buses across the country also means that it is more challenging for these vehicles to differentiate themselves as being special or unique.
- Buses oftentimes lose seating capacity or compromised seating configurations to accommodate the low floors.
- Propulsion technologies available with most low-floor buses produce at least a small amount of emissions from the vehicles.

Figure 5: Example of 30-foot long low-floor bus

Non-electric Vintage-styled Trolley Buses

Advantages:

- The appearance of vintage-styled, non-electric trolley buses is more unique than that of the more prevalent low-floor transit bus and may be more recognizable in the U.S. market as a circulator/shuttle service.
- These buses for many evoke some nostalgia and some interest in riding for an "experience."
- Though not as ubiquitous as low-floor transit buses, multiple suppliers manufacture these vehicles and other transit properties have similar buses in their fleets.

Figure 6: Vintage-styled, non-electric trolley bus - Monrovia, CA

- These buses generally have some of the lowest capital costs relative to other transit vehicles.
- Some vintage-styled rubber-tired trolley buses are available with low-emission technologies.

Disadvantages:

- The appearance of vintage-styled, non-electric trolley buses may imply for some that the service is only tourist-oriented with an entertainment/city tour function.
- Most of these vehicles do not feature low floors and therefore tend to require longer dwell times at bus stops.
- These vehicles tend to offer fewer choices regarding the number and placement of doors which can be a critical criterion for a circulator vehicle.
- On buses without low floors, hydraulic lifts are typically used to provide ADA access; these lifts have a fairly high rate of breakdowns.
- Maintenance costs can run even to somewhat higher for these vehicles compared with more standard transit buses; this is due mainly to the smaller number of these vehicles produced and maintained across the country and the potential for unique parts (e.g. wood seats and trim) and decorative elements.
- Many vintage-styled, non-electric trolley buses include smaller windows that may obstruct the views of both the people riding the service and by pedestrians looking at the bus; both situations may discourage casual ridership.
- These vehicles tend to offer fewer low-emission technologies.

Guided Light Transit (GLT)

As mentioned above, GLT is currently found only in the two French cities of Caen and Nancy. This technology is a blend of bus and fixed-guideway technology. GLT vehicles, whose weight is supported on rubber tires, are capable of running independently like a conventional bus or using a singular guide rail for steering (see Figure 7); in this sense, these vehicles should be considered as having two modes of operation (both conventional and guided).

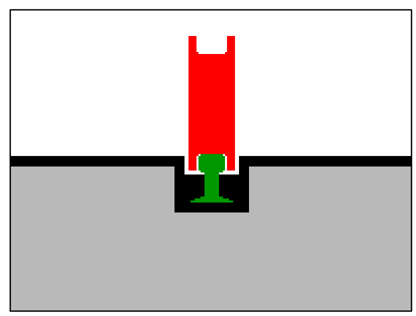

Figure 7:
Diagram of central guide rail for Bombardier GLT system installed in Caen and Nancy, France

Advantages:

- GLT vehicles are generally longer than buses and have seating capacity similar to streetcars.
- These vehicles have a modern appearance similar to that of streetcars.
- They operate on electricity and are therefore emit no emissions from the vehicles.
- Vehicles with rubber-tires have significant more traction than those with steel wheels and therefore generally can climb steeper hills than streetcars (reportedly up to a slope of 13 percent).
- GLT vehicles may run independently of their central guide rail and therefore can serve parts of a route or route extensions without the embedded rail infrastructure. This also means that the vehicles are able to access remote maintenance facilities without the guidance system.

- GLT vehicles running in parallel lanes using a guide rail can operate closer to each other compared to conventional buses with conventional operator-controlled steering.
- The vehicles can more precisely approach streetcar-like platforms with near-level boarding and without kneeling the vehicle.

Figure 8: Guided light transit (GLT) vehicles, Caen, France

Disadvantages:

- Installation of central, singular guidance rail is not considerably cheaper than constructing a conventional two-rail trackway for streetcars.
- Since the vehicles run over the same section of pavement when in the guided mode, significant rutting of pavement sections has occurred; solving this problem with a concrete roadway cross section reinforces the first bullet than the construction costs for these systems edge closer to those of streetcar systems.
- Ride quality has been described as less than that of streetcars and similar to that of a conventional bus.
- GLT technology, with its singular guide rail that does not benefit from bearing the weight of the vehicle, may prove problematic in climates with significant amount of snow and ice.
- GLT is a proprietary system of two manufacturers, so competition is limited and procuring vehicles or system parts from a competing firm would likely prove difficult or costly; one of the two manufacturers, Bombardier, is not currently selling its GLT system.

Figure 9: GLT central rail and concrete rutting repair

- GLT systems have not proven more cost-effective to operate than streetcars.
- There are no existing systems in North America; so Boise or any other city that is the first in this market to deploy this system would not be able, at least initially, to share risks, development costs or scale economies with any other transit properties.

Criteria for Vehicle Selection – Buses

There are obviously different approaches to deciding the appropriate buses for use on any particular system. The approach recommended in this memorandum is that resources initially be devoted to deciding the basic type and configuration of a rubber-tired vehicle, if that is the circulator mode selected, and not to focus on a specific vehicle or vehicle details until further project definition occurs.

Following is a list of screening factors important to the effort of defining the basic type of bus circulator vehicle most appropriate for the Downtown Boise Circulator.

Core Concept and Aesthetics

Is it important or necessary that the circulator vehicles present a vintage appearance, or, conversely, does Boise want its circulator vehicles to offer a modern appearance? Is there a nostalgia factor that can only be satisfied by rubber-tired, vintage-styled non-electric trolley buses, or is the focus on provision of a contemporary transportation solution?

Availability and Uniqueness

Due to the large number of transit buses deployed across the country, the uniqueness of any rubber-tired vehicle would depend largely on its distinct visual appearance and not on its uniqueness as a vehicle type. Though some lead time is required for the preparation of specifications, contracting, manufacturing and delivery scheduling, availability should not present much of an issue for a rubber-tired vehicle (excluding the GLT option).

Size and Scale and Capacity

It is important to establish the basic, but not exact, size of the circulator vehicle relatively early in the process. The seated and standing capacities of a 30- or 35-foot-long bus will most likely suffice for a Downtown Boise Circulator function based on other cities experiences with circulator services.

Configuration (number of doors, seating configurations)

All buses, with the exception of one GLT vehicle by Translohr, have operator cabs at their front ends only and therefore use a single-ended operation. Similarly, the vast majority of buses in the U.S. only have doors on their right sides. When choosing buses for a circulator, the biggest configuration questions center on the number and placement of doors and seating layouts. Low-floor buses, as the near-standard of the U.S. transit fleet, offer more options regarding number of doors, door placement and seating configurations than the vintage-styled trolley buses.

Accessibility

Accessibility of the circulator vehicle for all customers, and specifically for mobility-impaired patrons, is a critical requirement. Since the late 1980s, a majority of modern transit buses have addressed this need with stepless entries and low floors for a portion or all of the passenger area; the stepless entry feature is oftentimes coupled with a relatively simple mechanical ramp that can be deployed at the entry. High-floored vintage-styled non-electric trolley buses often use hydraulic lifts to provide ADA access that are prone to failure.

Passenger Comfort

Almost all modern transit vehicles in the U.S. use a heating, ventilation, and air conditioning (HVAC) system for passenger comfort. Low-floor buses generally have larger windows than the vintage-styled non-electric trolley buses.

Conformance to Federal Regulations (Buy America)

Since the 1980's, whenever local agencies use Federal funds to purchase transit vehicles, the local agencies must conform to certain Federal regulations, commonly known as Buy America. Basically, the Buy America regulations require that a majority (now 60%) of the components used in the vehicles must be of U.S. origin and that final assembly of the vehicles must occur in the U.S. This provision will not be an issue except for the GLT vehicles.

Cost

Based on other the experience of other cities, a very rough guideline for the cost of vintage-styled, non-electric trolley buses would likely run between $250,000 and $300,000. Acquisition costs for modern low-floor buses, usually offering more recent technologies and passenger comforts, range somewhat higher between $325,000 and $425,000. Estimated prices for the GLT vehicles approach those of streetcars.

Table 4 provides a summary of criteria for bus selection.

Table 4
Summary of Vehicle Selection Criteria – Buses

Selection Parameter	Vintage-styled Non-electric Trolley Bus	Low-floor Bus	Guided Light Transit
Core Concept	Heritage	Modern	Modern
Availability	Somewhat Limited	High	Low
Fleet Similarity	Moderate	High	Low
Size			
Width	Typical 8-9 feet	Typical 8-9 feet	7.5-8.25 feet
Length	Typical 30-35 feet	Typical 30-40 feet	80-150 feet
Performance	Good	Good	Unknown
Configuration			
Doors	Single-sided	Single-sided	Single- or double-sided
Seating	Limited options	Multiple options	Multiple options
Accessibility	Moderate	Good	Very Good
Passenger Comfort			
HVAC	Yes	Yes	Yes
Noise	Moderate	Moderate-Quiet	Moderate-Quiet
Windows	Small	Large	Large
Ride Quality	Moderate	Moderate	Moderate
Buy America	Yes	Yes	Not currently
Cost	$250,000-$300,000	$325,000-$425,000	$1.5M to $3.5M estimated
Maintenance Needs	Average to Above Average	Average	Above average

CANDIDATE VEHICLES - STREETCAR

Streetcar Vehicles

A wide range of streetcar vehicles exists for consideration for a Downtown Boise circulator system. Streetcars have a long history, stretching back to the late nineteenth century when early versions utilized horses to provide the power. For the purpose of this report, streetcar vehicles are divided into three broad, chronological categories: vintage trolleys, Presidents Conference Committee (PCC) cars, and modern streetcars. Within each category, there are a seemingly endless number of variations and possibilities, which are summarized below. For vintage trolleys and PCC cars, a fundamental decision is whether to rehabilitate an existing vehicle or to replicate a historic design. For modern streetcars, often it is a question of extent of departure from service-proven or “off-the-shelf” designs.

Particularly for modern streetcars, but also for vintage trolleys and PCC cars, some of the important configuration options and operational considerations that factor into the selection of a vehicle include the following:

Figure 10: Vintage trolley - Dallas, TX

- Basic size (length and width), clearance requirements, and capacity
- Performance (top speed, acceleration and braking rates)
- Sided-ness and ended-ness; that is single-sided, single-ended vs. double-sided, double-ended
- Single unit operation (tow bar or mechanical coupling only) vs. multiple unit operation (mechanical and electrical coupling)
- Floor height (low floor vs. high floor) and accessibility means

These and other considerations are reviewed in the following sections.

Streetcar Characteristics

Vintage Trolleys

The first electrically powered streetcars entered the American city landscape in the late 1880s, and by the early 1900s every large city, as well as many smaller ones including Boise, offered extensive streetcar networks.

The early streetcars typically were made with all-wood bodies or composite wood-and-steel bodies with deck roofs and clerestories. The earliest electric streetcars were small, 25 to 30 feet long, with a single four-wheel truck, but the popularity of this new technology soon required that operating companies acquire larger cars in the range of 40 to 50 feet in length. These cars typically had two powered trucks, were not articulated, were mostly high floor, were found in both single-sided, single-ended and double-sided, double-ended versions. Most systems operated streetcars as single units (see Figure 10).

Figure 11: Replicated vintage trolley - New Orleans, LA

Most of the early streetcars were retired by World War II, and those that still survive today are usually found in museums, as historical items at transit agencies, and in limited or special purpose service by private or non-profit institutions. Many are operated as tourist attractions. Restoring a 90-year old vintage trolley is a painstaking process and primarily an act of love. Keeping one operational is also a challenging task. The most extensive example of a restored vintage trolley system in the United States that is still operational is in New Orleans.

A few cities such as Portland and Tampa have opted to replicate rather than rehabilitate a vintage trolley, and New Orleans has a large replica fleet in addition to its refurbished cars (see Figure 11). Replicating a vintage trolley could involve, for example, the construction of a steel underframe and inclusion of more modern safety features, including braking systems, while retaining an original or vintage looking appearance (see Figure 12). This approach helps guarantee consistency of design and parts, and essentially results in a new product that has a vintage appearance.

Figure 12: Replicated vintage trolley - Portland, OR

PCC Cars

From the mid-1930s through the early 1950s, the Presidents Conference Committee car rose to fame throughout North America, and its design was exported to Europe and elsewhere. Again, while there were many variations, the PCC car was basically an all-steel, non-articulated car, approximately 50 feet in length, with two powered trucks and high floors (see Figure 13).

PCCs were built in both single-sided and double- sided configurations, and they were operated as single cars and in multiple unit consists. The rounded, more contoured look and several performance and passenger comfort improvements generally distinguished the PCC car from older vintage trolleys. Some transit agencies in the U.S. cities such as Boston and San Francisco, have retained and rehabilitated some of their PCC cars and still operate them in limited or special service. Philadelphia is embarking on a large PCC rehabilitation program (see Figure 13) that includes substantial changes to the original cars.

Figure 13: PCC Car - Philadelphia, PA

Modern Streetcars

For the purpose of this report, the term "modern streetcar" is meant to encompass new streetcar vehicles currently available in the marketplace and generally based on designs, technologies, and product improvements developed within the last decade. However, there is no precise definition for a "streetcar", and, while there is considerable experience in the U.S. with modern light rail vehicles (LRVs), the actual experience with modern streetcars in this country to date is limited to the Inekon/Skoda vehicle produced for Portland and duplicated with minor exceptions for Tacoma and Seattle. A similar car is being developed by Inekon for a demonstration project in Washington, DC. Most of what is considered modern streetcar experience resides in Europe, and streetcar vehicles there are typically defined more by the characteristics of their rights-of-way than necessarily by the characteristics of the vehicle itself. With the assistance of a federal grant, a prototype modern streetcar based on the Inekon/Skoda design is being produced with the intention of transitioning to a full production capability.

In Portland, a conscious effort was made to distinguish the city streetcar service and the streetcar vehicle from the regional light rail service and the LRV. Compared to the LRV, the streetcar vehicle is shorter (66 feet vs. 92 feet) and narrower (8 feet 1 inch vs. 8 feet 8 inches), thus making it less intrusive and more in scale with crowded urban streets and residential neighborhoods (see Figure 14).

Portland chose not to require multiple unit operation, so all streetcar operation is with single cars, further enhancing the feel of a smaller scale.


Figure 14: Modern U.S. streetcar by Inekon/Skoda - Portland, OR

Performance characteristics are accordingly reduced compared to those of the LRVs, which operate at higher speed with sections of grade separated right-of-way throughout the metropolitan area.

In Europe there is a substantial number of modern streetcars and streetcar manufacturers. All of the major railcar builders in Western Europe produce vehicles that generally fall within the streetcar category. Often, as in Portland, modern European streetcars tend to seat three abreast (two plus one) seating, thus resulting in a narrower vehicle cross section that is more suited for cramped European streets. Top speed is often limited to 40 to 45 miles per hour compared to the 55 to 60 miles per hour more common for LRVs. Most modern streetcars are articulated, and some, built from a modular design, have multiple articulations and stretch to over 100 feet in length. As is now commonplace with LRVs, most modern streetcars are partial or 100 percent low floor which helps facilitate boarding and simplifies meeting U.S. ADA requirements. Figures 15 through 19 provide examples of modern streetcars in Europe.

Figure 15:
Leoliner by Bombardier - Leipzig, Germany


Figure 16:
Combino Prototype by Siemens - Germany

Figure 17: Trio by Inekon - Ostrava, Czech Republic

Figure 18: Tram 2000 by Bombardier – Brussels, Belgium

Figure 19: Citadis by Alstom - Montpelier, France

Criteria for Vehicle Selection – Streetcar

There are obviously different approaches to deciding the appropriate rail vehicles for use on any particular system. The approach recommended in this memorandum is that resources initially be devoted to deciding the basic type and configuration of streetcar vehicle and to not focus on a specific vehicle or vehicle details until further project definition details are resolved.

Following is a list of screening factors important to the effort of defining the basic type of streetcar vehicle most appropriate for the Downtown Boise Circulator:

Core Concept and Aesthetics

Is it important or necessary that the streetcar vehicles present a vintage appearance, or, conversely, does Boise want the streetcar vehicles to offer a modern appearance? Is there a nostalgia factor that can only be satisfied by vintage trolleys, or is the focus on provision of a contemporary transportation solution?

Availability and Uniqueness

One difficulty with pursuing a vintage trolley approach as the sole solution is finding sufficient identical vehicles and parts. Furthermore, as the system expands, the problem becomes more acute. It is always possible to have a mix of hardware and vehicles, but the more unique each individual vehicle is, and the greater the variation in a small fleet, the more that normal maintenance and operational problems multiply. Much of this situation could be overcome with replicated vintage trolleys.

Size and Scale and Capacity

It is important to establish the basic, but not exact, size of the streetcar vehicle early in the process, not only for interface with civil elements but for fundamental public perception and to bracket the number of vehicles needed for various service levels. Given the scale of the downtown and rough patronage levels, streetcar vehicles in the 80 to 90 feet length or longer are likely not warranted from strictly a capacity basis.

Configuration (sided-ness, ended-ness, and coupling capability)

Single-sided, single-ended operation is a fairly substantial restriction for a new system. Virtually all new light rail systems and most new streetcar systems in this country in the last twenty years have chosen a double-sided, double-ended configuration. This report recommends that a double-sided, double-ended streetcar vehicle be assumed as the basis for system design.

Another configuration question is whether the streetcar vehicles should operate singly or entrain in multiple-unit consists. Further discussion is needed to sharpen the focus on this consideration.

Accessibility

Accessibility of the streetcar vehicle for mobility-impaired patrons is a critical requirement. Since the late 1980s, modern streetcars and LRVs have solved the problem with stepless entry, matching a low floor for a portion or all of the passenger floor area in the vehicle with the boarding platforms, both at a height of approximately 14 inches above the rail. While there were a few examples of low floor vintage trolleys in previous eras, realistically this is not an option today, and on-board lifts or some sort of raised platform and manual, folding ramp would be required for the vintage trolley or PCC option. The modern streetcar would be at least partially low floor and likely use a small, automatic bridging device to provide wheelchair accessibility fully compliant with the Americans with Disabilities Act. Alternatively, the vehicle might employ a leveling device that maintains a constant floor height regardless of passenger load.

Passenger Comfort

Almost all modern transit vehicles in the U.S. use a heating, ventilation, and air conditioning (HVAC) system for passenger comfort. While vintage trolleys and PCC cars were heated in cold weather, they were not equipped with air conditioning. Incorporation of modern HVAC equipment into the older vehicles could be problematic, although an HVAC system has been accommodated in the Tampa and Little Rock replica cars.

Conformance to Federal Regulations (Buy America)

Since the 1980's, whenever local agencies use Federal funds to purchase transit vehicles, the local agencies must conform to certain Federal regulations, commonly known as Buy America. Basically, the Buy America regulations require that a majority (now 60%) of the components used in the vehicles must be of U.S. origin and that final assembly of the vehicles must occur in the U.S. The regulations also set out various audit procedures and waiver conditions. If no manufacturers commit to meeting the content and assembly requirements, a waiver from those requirements may be possible. Also, if a local agency does not use Federal funds to purchase the vehicles such as Boise is considering, the Buy America regulations are not applicable.

Rehabilitation or replication of vintage trolleys or PCC cars would almost certainly utilize U.S. components and be performed in the U.S. so Buy America should not be an issue if the vehicles were purchased using Federal funds. However, the picture is not so clear with respect to modern streetcars. Portland, Seattle, Tacoma, and Washington, DC have purchased vehicles using local funds, and Buy America has not been applicable. Final assembly of these vehicles has taken place in the Czech Republic. While most European carbuilders have established final assembly plants in the U.S. for LRV or heavy rail vehicle procurements, it remains to be seen if any would elect to do so for a small order of streetcars. A U.S. manufacturer is currently building a prototype modern streetcar based on a licensed design of the Portland Inekon car and could provide a Buy America-compliant vehicle for Boise and other cities in the United States.

Cost

A very rough guideline is that restored or replicated vintage trolleys or PCC cars would likely cost $0.5M to $1.0M, depending on the extent of restoration. Modern streetcars would cost from $1.5M to $3.5M depending on the technical specifics. However, in terms of carrying capacity or per-seat cost, the cost differential begins to narrow given that the modern streetcar vehicle has substantially more passenger capacity.

Table 5 provides a summary of criteria for streetcar vehicle selection.

Table 5
Summary of Vehicle Selection Criteria - Streetcar

Selection Parameter	Vintage Trolley		PCC	Modern Streetcar
	Rehabilitated	Replica		
Core Concept	Heritage	Heritage	Classic	Modern
Availability	Limited	Somewhat Limited	Somewhat Limited	Moderate
Fleet Similarity	Low	High	Moderate	High
Size				
Width	Typical 8 feet	Typical 8 feet	Typical 8-9 feet	Typical 8-9 feet
Length	Typical 40-45 feet	Typical 40-45 feet	Typical 50 feet	60 to 120+ feet
Performance	Modest	Modest	Modest	Good
Configuration	SS/SE and DS/DE	SS/SE and DS/DE	SS/SE and DS/DE	SS/SE and DS/DE
Electrical Coupling	No	No	Yes	Yes
Accessibility	Very Difficult	Marginal	Very Difficult	Very Good
Passenger Comfort				
HVAC	Unlikely	Possible	Unlikely	Yes
Noise	Loud	Somewhat Loud	Somewhat Loud	Quiet
Ride Quality	Lacking	Moderate	Moderate	Good
Buy America	Yes	Yes	Yes	Question Mark
Cost	$0.5 to $1.5M	$0.5M to $1.5M	$0.5M to $1.5M	$1.5M to $3.5M
Maintenance Needs	Very High	High	Very High	Average

Summary

A wide rang of vehicles, both rubber-tired and streetcar, are potentially available for use for a Downtown Boise Circulator. Each has its own set of characteristics, advantages and disadvantages. This technical memorandum identifies the range of options available, the features of each and how each rates in terms of a series of criteria often used to evaluate modes and types for use in a circulator application.

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APPENDIX

Appendix Table 1A
Representative U.S. Bus Circulator Systems and Characteristics

City	Service	Operating or Funding Agency	Characteristics
Austin, TX	**Dillo**	Capital Metropolitan Transportation Authority	Historic reproductions of trolley cars provide circulator service to downtown Austin, the Capitol Complex, University of Texas campus, and free Park and Ride lots. The service consisted of five routes until summer 2008 when it will be cut down to two; service frequency will likely increase with the change. Currently offered free of charge, the transit authority is considering instituting a fare. The Dillo routes serve a number of destinations, including shops, restaurants, the convention center, major employers, and tourist attractions.
Chattanooga, TN	**Downtown Electric Shuttle**	CARTA	The Downtown Electric Shuttle in Chattanooga has played a key role in the downtown area's redevelopment. It operates 7 days a week with a 5 minute headway and is free to riders. The service is provided with low-floor, electric vehicles and the operating costs are partially subsidized with parking revenues.
Denver, CO	**FREE MallRide**	RTD	Denver operates a circulator on the 16th Street Mall, which is provided free of charge and operates in its own right-of-way. It is RTD's best-performing route. RTD initially operated the Cultural Connections Trolley, which was primarily geared towards tourist attractions. Because the service did not produce adequate ridership, it is now being contracted to a private company.
Los Angeles, CA	**DASH**	Los Angeles DOT	Los Angeles's DASH service oprerates eight circulator routes in the downtown area. Fares are $0.25 and service is provided every 5 to 20 minutes on weedays. On weekends, three of the routes operate, with a 12 to 20 minute headway. The circulators serve a number of destinations, including cultural attractions, city hall, the courthouse, restaurants, and employer sites.
Milwaukee, WI	**Milwaukee Trolley Loop**	Milwaukee County Transit System	The Milwaukee Trolley Loop serves the major events and attractions in downtown Milwaukee. The service consists of one route that runs during the summers only, utilizing a non-electric, rubber-tired trolley bus. It runs on 20 minute headways and the fare is free. Hours of operation are 11AM to 10PM Wednesday through Saturday.
Oklahoma City, OK	**Oklahoma Spirit Trolley Service**	COPTA	The Oklahoma Spirit trolley service, connects the Downtown/Bricktown area and the I-40/Meridian hotel and restaurant district. The trolleys provide shuttle service seven days a week. There are 3 lines (red, blue, and orange). The blue line is an all day downtown circulator while the red line only runs at lunch time. The orange line connects the I-40/Meridian hotel/restaurant district with downtown. The fare varies on the different lines.
Orlando, FL	**LYMMO**	LYNX	Lynx's LYMMO service provides transportation for employees and visitors in downtown Orlando. The serice is provided with low-floor buses outfitted with whimsical designs. During office hours, LYMMO operates every 4-5 minutes. After hours and on weekends, the service operates on a 10 to 15 minute headway. LYMMO has its own lane and controls its own traffic signals in order to ensure that it isn't slowed by traffic. The service is free.
Washington, DC	**DC Circulator**	District DOT/ WMATA	The DC Circulator is a public/private partnership between the District Department of Transportation (DDOT, program owner), Washington Metropolitan Area Transit Authority (WMATA, program manager), and DC Surface Transit, Inc. (including several business improvement districts). A private transportation contractor operates the service. With a fare of $1, diesel-powered buses serve each stop every 5-10 minutes from 7 a.m. to 9 p.m. daily. The service has ordered smaller 30-foot buses for an expansion in 2009.

Source: MultiSystems, District of Columbia Circulator Implementation Plan, July 2003; URS, July 2008

Appendix Table 1B
Representative U.S. Bus Circulator Systems and Characteristics

City	Service	Number of Routes	Roundtrip Length (miles)	Connecting Modes/ Services	Span of Service	Peak Headway	Off-Peak Headway	Reserved Right-of-Way	Fare Structure	Annual Ridership
Austin, TX	**Dillo**	5	3.5-8.5	Local buses	M-F 6:30am-8:30pm; Sat. 10am-7pm; Sun. 11am-7pm; varies by route	8-10 minutes commuter; 20-30 minutes tourist	15-20 minutes commuter; 20-30 minutes tourist	No	Free	1,119,000
Chattanooga, TN	**Downtown Electric Shuttle**	1	3	Local and express buses; parking	M-F 6:30am-11pm; Sat. 9am-11pm; Sun. 9am-8:30pm	5 minutes	5 minutes	No	Free	900,000
Denver, CO	**FREE MallRide**	1	2.8	Local and express buses; light rail; Amtrak	M-F 5am-1:35am; Sat. 5:30am-1:35am; Sun. 7am-1:35am	2-4 minutes	4-8 minutes	Yes	Free	16,700,000
Los Angeles, CA	**DASH**	8	3-7	Local and express buses; light and heavy rail; commuter rail; Amtrak	M-F 6am-7pm; Sat. 6:30am-5pm; Sun. 10am-5pm; varies by route	5-10 minutes	5-10 minutes (15-20 on weekends)	No	$0.25; One free transfer; MTA passes accepted; single-ride tickets and monthly passes	7,000,000
Milwaukee, WI	**Milwaukee County Transit Trolley**	1	3	Local and express buses	W-Sat 11am-10pm; summer only	20 minutes	20 minutes	No	Free	
Oklahoma City, OK	**Oklahoma Spirit Trolley Service**	3		Parking	M-Sat 9am-11pm; Sun. 11am-8:30pm; varies by route	10-20 minutes; Varies by route	15-45 minutes; Varies by route	No	$0.25-$1.00; $0.10-$0.50 for seniors and disabled; varies by route; free with parking stub	
Orlando, FL	**LYMMO**	1	2.7	Parking	M-Th 6am-10pm; F 6am-midnight; Sat. 10am-midnight; Sun. 10am-10pm	4-5 minutes	10-15 minutes	Yes	Free	
Washington, DC	**DC Circulator**	3	3-9	Local and express buses; heavy rail; commuter rail; Amtrak	Daily 7am-9pm (Orange/Red lines); weekends only 10am-6pm (Purple Line)	10 minutes	10 minutes	No[1]	$1.00; $0.50 for seniors/disabled; free with Metrorail transfer	3,000,000

[1] At least one route has striped bus-only lanes but their utility is limited due to right-turn and truck-loading activity that is not regularly enforced.

Source: MultiSystems, District of Columbia Circulator Implementation Plan, July 2003; URS, July 2008

Appendix Table 1C
Representative U.S. Bus Circulator Systems and Characteristics

City	Service	Type of Vehicle	Type of Fuel	Cost per Vehicle[2]	Vehicle Seating Configuration	Facilities at Stops	Capital Funding Sources	Operating Funding Sources
Austin, TX	**Dillo**	Trolley	Diesel	$269,000	Perimeter and forward-facing	Distinctive signs that are a different color and have an armadillo icon.	Local funding	Sales tax, investment income, other local revenue sources
Chattanooga, TN	**Downtown Electric Shuttle**	Low-floor bus	Electric	$200,000	Perimeter	Simple shelters	FTA; state DOT; local MPO	Parking revenues
Denver, CO	**FREE MallRide**	Low-floor bus	Electric/CNG hybrid	$450,000	Perimeter	Stations at end of route Stops every block	FTA; local funding	RTD general funding (sales tax funds)
Los Angeles, CA	**DASH**	Low-floor bus	Propane	$260,000	Perimeter	Posts with DASH symbol; Eye-level information	LADOT	12-13% fares; remainder sales tax revenue
Milwaukee, WI	**Milwaukee County Transit Trolley**	Trolley	Diesel	$250,000	Perimeter and forward-facing	Eye-level signs showing "Milwaukee Trolley Loop"	80% FTA; 20% local	
Oklahoma City, OK	**Oklahoma Spirit Trolley Service**	Trolley	Diesel	$270,000	Perimeter and forward-facing	Some stops have specially designed shelters	Sales tax	4% fares; 18% federal funding; remainder local; area attractions contribute some funding
Orlando, FL	**LYMMO**	Low-floor bus	CNG		Perimeter seating and lean bars	Stops have unique shelters	FTA; state DOT; local match	Downtown property tax; parking revenues
Washington, DC	**DC Circulator**	Low-floor bus	Diesel	$385,000	Perimeter and forward-facing	Some stops have specially designed shelters	Local funding	Fares; federal funding; District DOT; public/private partnership including convention center and multiple business districts

[2] Vehicle cost at time of purchase.

Source: MultiSystems, District of Columbia Circulator Implementation Plan, July 2003; URS, July 2008

Treasure Valley High-Capacity Transit Study

Downtown Boise Circulator

Bus Option

Conceptual Design

Technical Memorandum

August 2008

Prepared for:

Valley Regional Transit
Community Planning Association of Southwest Idaho

Prepared by:

URS Corporation

SECTION 1 – INTRODUCTION AND SUMMARY

1.1 Introduction

The purpose of this technical memorandum is to identify and review the concepts that formulate a bus option for the Downtown Boise Circulator.

The *Downtown Boise Mobility Study* completed in 2005 identified a downtown circulator as a key element of a strategy to increase the transportation options for trips within downtown Boise and to and from major destinations adjacent the downtown. As an element of the current Treasure Valley High Capacity Transit study, the Downtown Boise Circulator has been advanced through a series of planning stages to the point that an initial alignment has been identified and is the subject of this technical memorandum and a companion set of conceptual plans. The planning process included the development of a project Purpose and Need Statement, project goals and objectives and the identification of major existing and planned destinations that a streetcar or bus-based circulator system might serve in the downtown area.

The project technical and policy committees, with input from the public via two well attended Open Houses, identified and commented on a series of future system plans that depicted how a system might develop over time. A preferred plan, designated "Alignment Plan C (modified)," was adopted by the project Downtown Policy Advisory Committee (DPAC). The plan calls for an east-west alignment that would originate in the west near 30th Street and extend through the downtown core to a terminus in the vicinity of Broadway and Front. A second alignment would generally provide a north-south orientation, serving the developing multi-family housing area south of the Connector in the vicinity of 13th to 16th streets, through the downtown core, and south to serve Boise State University and possibly the Boise Depot and adjacent neighborhoods.

A set of characteristics that would define an initial segment of the circulator system plan was developed and reviewed by the DPAC. Recognizing that cost of an initial segment is a paramount consideration, the objectives in defining initial segments were identified as:

- Providing connections between a number of existing downtown destinations
- Supporting planned development opportunities
- Exhibiting a high probability of success from a ridership perspective
- Providing access to the planned downtown multi-modal center (MMC)
- Having the ability to be easily expanded into the planned full circulator system
- Having access to an operations and maintenance facility site (if the streetcar mode were to be selected)

Recently, a streetcar circulator alignment that uses Main, Idaho and Bannock streets (and Idaho and Bannock streets to access the multi-modal center site H [MMC]) was adopted. In order to compare a bus circulator option with the streetcar, the streetcar route was duplicated, with only minor modifications. This was deemed suitable since the adopted initial streetcar alignment satisfies a number of best practices for downtown circulators in general. These practices include:

- A simple-to-understand route

- Access to multiple significant downtown employment and non-employment destinations
- Access to multiple downtown parking facilities
- Access to principal transit facilities (the proposed multi-modal center site H)
- Integration with other existing bus transit services in Downtown Boise on Idaho and Main streets
- Station/bus stop spacing that promotes good access to downtown employment and non-employment destinations without unduly slowing circulator route times

Using a similar route for both the streetcar and bus modes also allows for a more straightforward comparison of features and costs. The Downtown Boise Circulator bus option is illustrated in Appendix A and is referenced as the:

- Main/Idaho, Idaho/Bannock Couplet

Other best practices for bus circulators that were assumed for this effort include:

- Frequent service (with arrivals during most of the day no less than 15 minutes apart)
- Unique appearance and brand that differentiate the circulator vehicles from the rest of the transit system
- Easily-identified bus stops, graphically related to the vehicles, that provide easy-to-use customer information

Similar to the Conceptual Design Report for the streetcar option, this memorandum presents a concept-level design for an initial bus circulator route in two parts. This memorandum reviews the basis for the concept design, the order-of-magnitude capital cost estimates, an operations plan and operating cost estimates. This is accompanied by a set of conceptual-level plans for the bus circulator route under consideration.

1.2 Summary

The bus circulator route (Main/Idaho, Idaho/Bannock Couplet) begins at the east end of the downtown core at 1st and Idaho streets, running west on Idaho Street to 17th where it turns north one block and turns east on Bannock Street, south on 10th Street, and east on Main Street to 1st Street to complete the loop. Please see Appendix A for this Boise Circulator (Bus Option) Route.

For purposes of establishing a concept design, a 30-foot transit bus, like those on order for the very successful Washington DC Circulator, has been used in establishing design guidelines. The concept design is also based on the design experiences gained from recent design and construction of bus stop improvements in Portland, Oregon.

Since the streetcar station locations were tentatively located to maximize access to major destinations and optimize system operations, circulator bus stops have mostly been located in the same place. Only where bus operational needs diverged from those of the streetcars were bus stop placements adjusted; this occurred in two locations where bus circulator stops were switched to the opposite side of the intersection from the proposed streetcar station.

The following Table 1.2.1 provides a summary of the circulator bus alternative.

Table 1.2.1
Route Summary

Design Consideration	Main/Idaho, Idaho/Bannock Couplet
Length (route miles)	2.6
Bus Stops	13
MMC Site H Access	East- and westbound route segments straddle Site H providing direct transfers to/from other buses
Bicycle Interface	Parallel bike lane on Bannock (10th to 13th) and crossing at 10th
Running Time	20 minutes
Vehicle Fleet Requirements (based on 15 minute frequency)	3 required (4 proposed)
Operating Cost Estimate (annual)	$647,000
Capital Cost Estimate (2008 $)	$3.3 Million
Development Opportunities	Development sites and opportunities exist along the entire alignment

SECTION 2 – GENERAL DESIGN CONSIDERATONS

This section describes the general design assumptions and considerations for the initial segment route alternative for the Downtown Boise Circulator Study bus option.

2.1 Vehicles

There exists a wide range of transit buses from which to choose for a downtown Boise bus circulator. For the purpose of this memorandum, the assumed design vehicle is a 30-foot long, low-emission diesel or compressed natural gas (CNG) powered bus. Figure 2.1.1 illustrates the characteristics of the vehicle; the photo closely represents buses currently on order for the DC Circulator in the nation's capital to expand their successful circulator system.

Figure 2.1.1: 30-foot Bus Illustration
(similar to buses on order for DC Circulator expansion)

The design parameters will accommodate a range of bus lengths from 30 to 40 feet and include the provision for two doors on the right side of the bus. Table 2.1.1 highlights the characteristics of the representative 30'-foot bus vehicle.

Table 2.1.1
Possible Bus Vehicle Configuration

Length	30' 0"
Width	8' 6" – 10' 3"*
Height	10' 3"
Weight	~30,000 lbs.
Boarding	Right-side-only
Operator cab	Front end
Bus stop curb heights	6 - 8"

* Larger dimension includes mirror-to-mirror width

2.2 General Design Guidelines and Assumptions

The conceptual design guidelines and assumptions for the Downtown Boise Circulator bus option are based on a combination of bus route and design experience. A brief summary of preliminary design standards established for this project, including bus stop curb heights are included in the table below.

Table 2.2.1
Design Guidelines and Assumptions

Design Element	Project Guidelines	Comments
Typical Section		
Pavement section (street-running)	Use existing streets	Concrete bus stop pads to be constructed at two busiest stops
Traffic separation (street-running)	Standard traffic striping/ pavement treatment	Shared with autos except at existing bus-only-lanes
Route		
Maximum design speed (street- running)	25 mph	Most transit buses can reach ~55 mph
Signals		
Street Operations	Traffic signal queue jump (early green) if needed; prioritization possible but not likely warranted	Buses uses same signals as autos except in 2-3 special cases
Bus Stops		
Curb height	Same as sidewalk specifications: 6-8 inches	
Bus stop length	25 feet (front loading area, shelter area, rear access area)	Typical for 30-35' buses; additional distance needed from intersection at farside stops

2.3 Route Summary and Route Extensions

The bus circulator route begins at the east end of the downtown core at 1st and Idaho streets, running west until reaching 17th Street, turning north one block where it turns east onto Bannock Street. The alignment follows Bannock to 10th Street where it turns south for two blocks, connecting onto Main Street heading east to 1st Street where it turns north completing the loop.

Potential future extensions to the east and west of this proposed route are readily feasible due to the flexible nature of bus routing. As a circulator, however, route simplicity should be maintained as it evolves beyond that route identified. Route extensions east along Broadway toward the east side of the Boise State University campus and west along the Main/Fairview couplet could be accomplished in a manner that maintains an overall route that is simple for potential riders to understand.

2.4 Bus Stops

Preliminary bus stop locations are shown in the conceptual plan set and are listed in Table 2.3.1; the five different types of bus stop improvements assumed for cost estimating purposes are described in Table 2.3.2. Similar to the proposed streetcar option, the 13 proposed bus stops are generally spaced about two to three blocks apart in order to provide a good level of pedestrian access and to roughly correspond to the spacing of the streetcar option. A project design phase would include a more detailed assessment of the preliminary locations. Further evaluation of the bus stop locations for accessibility, compatibility with adjacent businesses and other possible conflicts would be undertaken during the design phase of the project. Accessible (ADA) boarding will be accommodated at each bus stop.

Bus stops will generally feature sidewalk-level concrete landing areas that satisfy all ADA boarding requirements. The curb height at the ADA boarding area will have an approximate curb height of 6-8 inches; flip-down ramps for ADA access are located at the front door on some buses and at the rear door on others.

The length of the bus stop area, which is dependent on the vehicle length and exact door spacing, has been assumed to be 25 feet for this review. Lengths of bus stop areas increase when they are located at the farside of an intersection so that the bus is adequate distance from the intersection and pedestrian crossing when servicing the stop.

The typical bus stop location will vary from nearside and farside at intersections and at three of the 13 stops will occupy the existing parking lane in the form of a sidewalk bulb out (curb extension). The other ten stops will either service the stop from the existing bus-only lanes on Idaho and Main or use a bus zone (no parking area) where on-street parking would otherwise exist.

Bus stop amenities, furnishings and other stop features have not been developed in detail but have been assumed to include an 8 to 10 foot wide concrete landing area with a shelter, bench, trash receptacle, and "next bus" electronic sign. All stations will meet ADA design requirements and would be compatible for use by the VRT bus fleet.

Table 2.3.1
Bus Option Stop Locations
Main/Idaho, Idaho/Bannock Couplet

Stop	Stop Direction	Stop Location	Stop Position	Stop Type[1]
1	Northbound	N 1st Street	Mid-block (between Idaho & Main)	2. Bus zone; replace landscape strip
2	Westbound	W Idaho Street	Farside of N 3rd Street	2. Bus zone; replace landscape strip
3	Westbound	W Idaho Street	Nearside of N 6th Street	4. Travel lane; extend bulb out
4	Westbound	W Idaho Street	Nearside of N 8th Street	3. Bus lane; existing VRT bus stop
5	Westbound	W Idaho Street	Farside of N 10th Street (MMC)	4. Travel lane; new bulb out
6	Westbound	W Idaho Street	Farside of N 13th Street	2. Bus zone; replace landscape strip
7	Westbound	W Idaho Street	Nearside of N 16th Street	2. Bus zone; replace landscape strip
8	Eastbound	W Bannock Street	Farside of N 16th Street	2. Bus zone; replace landscape strip
9	Eastbound	W Bannock Street	Farside of N 13th Street	1. Bus zone; use sidewalk
10	Eastbound	W Bannock Street	Nearside of N 10th Street (MMC)	1. Bus zone; use sidewalk
11	Eastbound	W Main Street	Nearside of N 8th Street	3. Bus lane; existing VRT bus stop
12	Eastbound	W Main Street	Farside of N 6th Street	4. Travel lane; extend bulb out
13	Eastbound	W Main Street	Nearside of N 3rd Street	1. Bus zone; use sidewalk

[1] See following Table 2.3.2 for a description of the five general bus stop types assumed for this option.

Table 2.3.2
Bus Option Stop Features
Main/Idaho, Idaho/Bannock Couplet

Stop Type	Stop Description (lane position; stop area)	Stop Features	Number of Stops	Estimated Capital Cost[1]
1	**Bus Zone Stop/ Use Existing Sidewalk** Includes: new shelter and signs/poles	• Shelter (with static info display); bench • Real-time bus arrival display (with electrical connection) • Bus stop sign and pole (high-quality, flag-mounted); trash receptacle • Bus zone (no parking) signs, poles and curb markings Estimated Total Cost	3	$19,500
2	**Bus Zone Stop/ Replace Landscape Strip** Includes: bus zone (no parking area); replace landscape strip with concrete bus stop boarding area	• Concrete boarding/landing area (assume 10' x 25' area) • Shelter (with static info display); bench • Real-time bus arrival display (with electrical connection) • Bus stop sign and pole (high-quality, flag-mounted); trash receptacle • Bus zone (no parking) signs, poles and curb markings Estimated Total Cost	5	$22,500
3	**Bus Lane Stop/ Existing VRT Bus Stop** Includes: new concrete bus pad within existing bus-only lane	• Real-time bus arrival display (with electrical connection) • Bus stop sign and pole (high-quality, flag-mounted); trash receptacle • New concrete bus pad in bus-only lane (10' x 50') Estimated Total Cost	2	$27,000
4	**Travel Lane Stop/ Extend Sidewalk Bulb Out** Includes: extending existing sidewalk bulb out for bus stop	• Extend existing concrete/brick sidewalk bulb out (assume 7' x 25' area; 35 LF new curb; adjust 2 utility covers; relocate 1 catch basin) • Shelter (with static info display); bench • Real-time bus arrival display (with electrical connection) • Bus stop sign and pole (high-quality, flag-mounted); trash receptacle Estimated Total Cost	2	$35,000
5	**Travel Lane Stop/ New Sidewalk Bulb Out** Includes: constructing new sidewalk bulb out for bus stop	• Construct new concrete sidewalk bulb out (assume 7' x 35' area; 50 LF new curb; adjust 3 utility covers; relocate 1 catch basin) • Shelter (with static info display); bench • Real-time bus arrival display (with electrical connection) • Bus stop sign and pole (high-quality, flag-mounted); trash receptacle Estimated Total Cost	1	$37,000

[1] Excludes E&A and contingency.

2.5 Street Improvements

For the bus circulator option, all segments will use existing street infrastructure including the existing bus-only lanes on Idaho and Main streets. It is therefore assumed that the existing street reconstruction will be minimized to the following items:

- the two existing sidewalk bulb outs that currently serve pedestrian crossings would be extended in length to serve as bus stops (bus stop type 4)
- the new sidewalk bulb out that that would be constructed to serve as a bus stop (bus stop type 5)
- new concrete bus pads suggested for the two existing VRT bus stops at 8th Street within the Idaho and Main bus-only lanes (included with bus stop type 3).

While not enough information has been gathered to deem the two concrete bus pads as necessary at this time, this feature could help prevent future pavement buckling at these two stops that will likely remain heavily used even with a new downtown multi-modal center.

It is assumed that all existing curbs and sidewalks will not be impacted by the bus circulator service and/or bus stop improvements. All driveways and building entrances will be maintained.

2.6 Utilities

Due to the limited amount of street improvements with the bus circulator option, utility relocation and reconstruction should also be limited. Provisions within the capital cost estimate for utility adjustments have been provided at only three locations where either existing sidewalk bulb outs will be extended or newly constructed. At each of these three stops, allowances are made to adjust two utility box covers and relocate one stormwater catch basin.

2.7 Signals

In street-running segments, circulator bus movements will be governed by the existing standard traffic signals. Two new signals will be added on Bannock at 15th and 16th streets to ease movements through those intersections. Three other intersections are slated for the addition of a queue jump signal where a lane shift or a jump on adjacent auto traffic would be useful.

At the three locations proposed for a queue jump signal, the conceptual plan set identifies each with a “transit phase” next to the signal symbol. At these intersections, a new separate signal head will be provided for the bus queue jump. It will provide the bus operator an indication of when the bus is clear to advance ahead of adjacent auto traffic.

SECTION 3 – COST METHODOLOGY

3.1 Purpose and Scope

This section describes the methodology used to develop capital cost estimates.

3.2 Estimate Development

Estimates of project capital costs were developed in three steps. First, the bus circulator route was sufficiently defined in conceptual drawings for cost estimating purposes. Second, project components, consistent with the application of unit costs and appropriate to the level of definition, were identified and quantities and unit cost data were developed. Third, the quantities were assembled, selective unit costs applied and subtotaled into the major cost categories defined below to complete the cost estimate. The cost is considered an order-of-magnitude estimate that would be refined if the project definition is further defined and decisions are made regarding technical, implementation and administration aspects of the project. All costs are reflected as current year 2008 estimates.

3.2.1 Unit Costs

Unit costs appropriate to the level of alignment definition were developed from selected historical data including completed projects, standard estimating manuals and standard estimating practices. Unit costs include allowances for the contractor's margins, design fees, construction administration and project startup activities.

3.2.2 Cost Categories

Cost categories were used to summarize the project component costs into a comprehensive total estimate for the bus option. The major cost categories are as follows:

- Civil Construction/Traffic Signals
- Civil Construction/Bus Stops and Utilities
- Vehicles
- Right-of-Way
- Maintenance Facility Improvements (to existing VRT facility)
- Professional Services
- Contingency

The sum of these cost categories represents the total estimated capital cost estimate for the bus circulator option.

3.2.3 Year-of-Expenditure Cost Projections

To develop a capital costs estimate in year-of-expenditure dollars, a proposed construction schedule would need to be developed based on each of the major cost categories. A straight-line projection of cost would be developed based upon a calculated mid-point of construction and an appropriate inflation rate used for escalation. The sum of the major escalated cost categories would equal the total estimated capital costs for the project in year-of-expenditure dollars. This report does not present the project costs in year-of-expenditure dollars.

3.3 Project Cost Categories

This section describes each of the major capital cost categories used to assemble the estimates, and includes specific assumptions.

3.3.1 Civil Construction/Traffic Signals

Since civil construction in the bus circulator option is limited to the 13 bus stop areas, this category only includes the capital costs for traffic signal modifications. Such signal modifications for the circulator bus option would be limited to three intersections where lane movements would be better facilitated with a queue jump signal for buses. A new, separate signal head would be added to the existing signal arm and the software/traffic signal controller modified to provide detected buses with an early green signal.

All other civil expenses normally associated with this category are included as part of the bus stop category. These costs include basic infrastructure improvements such as mobilization, pavement removal and replacement, demolition, excavation and embankment, minor concrete work, walls and foundations, traffic control, streetlights, stormwater drainage, landscaping, fences, sub-grade preparation, and aggregate base.

3.3.2 Bus Stops and Utilities

This category includes the capital costs for fixed facilities and amenities for the circulator bus stops. The capital costs for the stops include concrete landing areas, shelters, lighting, benches, static customer information displays, real-time bus arrival displays, high-quality bus stop signs and poles, and minimal adjacent sidewalk modifications. The level of amenities was the same for each of the 13 stops including the two stops adjacent to the proposed multi-modal center.

Since the bus circulator option presents only minimal utility relocation or adjustment exposure at the bus stop locations, utility costs were included with this category.

3.3.3 Vehicles

This category includes capital costs for procuring circulator bus vehicles including spare parts and non-recurring costs.

3.3.4 Right-of-Way

The route proposed for the bus circulator option requires no property outside existing public right-of-way; therefore, no right-of-way costs are anticipated for this option.

3.3.5 Maintenance Facility Improvements

This cost category provides an allowance for improvements to the existing VRT maintenance facility for four additional buses with a different layout and components than existing buses.

3.3.6 Professional Services

This category includes the costs for engineering, administration and construction management services. Costs for these services will be based on a percentage of the total cost of all direct capital cost elements and are based on the historic experience with similarly scaled projects. Cost items for this category are as follows:

- Grantee Administration

  Cost of administration, management, design oversight, control, support, implementation, and start-up of the project.

- Design Services

  Cost of professional service consultants for engineering design including related services such as architectural, geotechnical and community involvement activities. This includes civil facilities design, surveying, geo-technical investigations and design services during construction.

- Project Control Services

  Cost of professional service consultants for project control and construction management. This category includes development and maintenance of procedures, schedule, budget, cost estimating and cost tracking, inspection and testing services.

- Other Services

  The costs of professional service consultants for legal assistance, financial advice, audits, permitting, safety/quality assurance assistance, public and community relations, training, and insurance brokerage services.

- Intergovernmental Agreements

  The costs for permits and local jurisdictional involvement in design and construction in accordance with any formal interagency agreements.

The total percentage to be applied to all capital cost categories except contingencies and vehicles is 20 percent.

3.3.7 Contingencies

A contingency will be added to the project costs as a percentage of all the direct cost categories to account for the uncertainty due to the level of design detail. Since there is limited exposure to utility relocations in the bus option, a contingency of 20 percent was allocated to all capital costs categories; a contingency of 30 percent would otherwise apply to utility costs where the cost exposure (e.g. the streetcar option) is greater. Contingency should reflect the degree of risk associated with the level of design detail available and the characteristics of the design component. The contingency for future design stages would be reduced as the design process progresses.

3.4 Project Capital Cost Summary

Appendix B provides an itemized capital cost estimate for the bus circulator option using the methodology described in the preceding paragraphs. Table 3.4.1 is a summary of the order-of-magnitude costs stated in year 2008 dollars.

Table 3.4.1
Capital Cost Estimates – Rough Order of Magnitude
Main/Idaho, Idaho/Bannock Couplet Bus Option

Route	Project Cost (2008)	Cost per Route Mile
Main/Idaho, Idaho/Bannock Couplet	$3.3 Million	$1.3 Million

SECTION 4 – OPERATIONS PLAN

The operations plan covers key service parameters that define the service available to passengers and outlines the costs required to provide service at various levels. Specifically, this section addresses:

- Hours of service
- Estimated speed of travel
- Running time
- Layover requirements
- Frequency of service
- Vehicle requirements

4.1 Hours of Service

This plan assumes the bus option for the Downtown Boise Circulator will operate over a span that duplicates that of the streetcar option. It would therefore operate for 15 hours on weekdays (7:00 AM to 10:00 PM) and for 14 hours on Saturdays (8:00 am to 10:00 pm). Later Saturday service is provided to support dispersed dining and entertainment opportunities for patrons wishing to park once. Sunday service is not planned for the initial offering, corresponding to current Valley Ride hours of service. These spans can be adjusted later based on further market analysis.

4.2 Travel Speed

Travel speed is a key variable in developing running time and operating costs because it determines how quickly a given vehicle can make a round trip. Travel speeds include the time required for stops as well as the speed between stops. The existing traffic conditions (including traffic signal controls) and the number of stops identified for the bus circulator option governs how fast the circulator vehicle will travel – the more stops, the lower the average speed.

Assuming that similar fare systems are used, circulator technology, whether streetcar or rubber-tired bus, affects travel speed to a lesser degree. Therefore, for the purpose of this analysis, it is assumed that streetcars and buses will use the same route, the same number of stops, the same intersection controls, and thus comparable operating speeds. Streetcars can accelerate slightly faster than many rubber-tired vehicles, but have the trade off of lower speeds on sustained operating segments; buses also have the ability to maneuver around traffic obstacles if needed.

As determined for the streetcar option, the Boise Downtown Circulator should achieve an average speed of 8 mph. This is based on a nominal downtown travel speed of 15 mph for all traffic, 13 stops for the bus circulator option and an assumed dwell time of approximately 30 seconds at each stop.

4.3 Running Time

At the assumed 8 mph, circulator vehicles will complete a round trip between 18 and 20 minutes (see Table 4.3.1). This implies that it will take just less than 10 minutes to travel from one end of the circulator coverage area to the other.

Table 4.3.1
Estimated Running Time
Main/Idaho, Idaho/Bannock Couplet Bus Option

Route	Roundtrip Mileage	Average Travel Speed	Round Trip Running Time (minutes)
Main/Idaho, Idaho/Bannock Couplet	2.6	8 mph	20

4.4 Layover

Layover and recovery time is required at the end of each trip to allow vehicles to return to schedule if delays occur, to allow drivers to take a break and to allow drivers to perform vehicle inspections. Some transit systems have labor agreements in place that stipulate specific minimum layover requirements. Typically, 15 to 20 percent of the total round-trip run time is scheduled for end-of-line layovers. In cases where operating segments are short, some providers use a minimum of 10 percent layover plus 5 minutes as a standard.

Table 4.4.1 details estimated running time for the bus circulator option along with the calculated layover requirement to determine the total cycle time. The table also highlights the amount of additional layover time available before the next cycle, assuming 10- or 15-minute headways.

Table 4.4.1
Estimated Layover Time
Main/Idaho, Idaho/Bannock Couplet Bus Option

Route	Round Trip Running Time (minutes)	Required Layover (20%)	Cycle Time Including Layover	Available Extra Layover
Main/Idaho, Idaho/Bannock Couplet	20	4	24	6

4.5 Frequency of Service

Operating headways should be as low as possible without incurring excessive costs. Fifteen-minute frequency of service is often considered the minimal headway for local circulator service. The more frequent a transit line operates, the less time patrons spend waiting. Frequencies higher than every 15 minutes often result in many customers walking for relatively short trips. In addition, very frequent service (at least every 15 minutes) allows riders to make trips without planning in advance. The next chapter details operating costs for both 15- and 10-minute headways, highlighting the impacts of adding service. For cost estimating purposes a 15-minute frequency of service is being used for project startup.

4.6 Vehicle Requirements

Vehicle fleet requirements are a combination of the peak vehicle requirement to operate service and the number of spares needed to ensure that a reliable service is maintained. The number required to operate is a function of the cycle time and frequency of service. Table 4.6.1 illustrates that operating with 15-minute headways would require two vehicles in operation while 10-minute headways would require three vehicles in use at any given time.

Table 4.6.1
Vehicle Requirements
Main/Idaho, Idaho/Bannock Couplet Bus Option

Service Option	Cycle Time Including Layover	Number of Vehicles Required to Operate
Main/Idaho, Idaho/Bannock Couplet with 10 min Headway	24	3
Main/Idaho, Idaho/Bannock Couplet with 15 min Headway	24	2

Generally, a 20 percent spare ratio is required for a standard transit fleet, rounded up to the next largest whole number of vehicles. In the case of very small fleets, it is sometimes desirable to have a minimum of two spares on the property to ensure reliable service and to provide flexibility should adjustments in routing or service frequency be desired. A total of four buses has therefore been used for the capital cost estimate.

4.7 Interaction with Existing Bus System

Current Valley Ride routes provide a high level of service along the Idaho–Main couplet and provide transfers via the Downtown Transit Center - defined by 9th, Main, Capitol and Idaho. The implementation of the downtown circulator and multi-modal center would create an opportunity to restructure Valley Ride service in downtown. Relying on the circulator to extend service in the east–west direction should benefit those routes running on tight schedules and not able to circulate downtown on a reliable basis. A number of routes operating west of downtown are tight and would improve schedule adherence by terminating at an MMC located west of downtown. Requiring transfers to the circulator can be viewed as an inconvenience to riders and would require a high level of circulator service. The circulator alignment has stops on the current Downtown Transit Center, keeping it as a hub for transit activity.

SECTION 5 – OPERATING COST

5.1 Operating Cost Methodology

The operating cost for circulator service, as with any type of transit service, is determined by the number of hours and miles operated, and by the cost for a unit (usually an hour) of operation. The number of hours and miles operated by any transit service are a direct result of the assumptions included in the operations plan for service. For example, increased frequency of service usually increases the number of vehicles required and results in a greater number of operators, which results in higher costs. The cost per hour is unique to the operator providing the service and reflects prevailing wage rates, operator-specific overhead costs, costs specific to the vehicles purchased, etc.

As presented in Section 4, the number of vehicles in operation and number of hours of operations are determined by the operations plan parameters and overlying assumptions including:

- Round trip distance;
- Travel speed;
- Frequency of service; and
- Hours of operation.

5.2 Per Hour Operating Costs for Buses

Operating cost estimates are based on a fully allocated hour of bus service. In this case, the costs include the cost of the operators, maintenance and fully allocated administrative, marketing and other ancillary expenses.

The existing bus service costs approximately $72 per hour (2006 National Transit Database[1]). and the following analysis uses this figure.

5.3 Operating Cost Estimates

The model presented in Table 5.3.1 derives an annual operating cost based on the $72 hourly operating cost (for bus service) along with calculated annual revenue hours using the operations plan parameters. The annual cost for 10-minute headways is just under $1 million, and nearly $650,000 for a 15-minute frequency of service.

Adding 10 hours of service would increase annual costs by $112,300 for 10-minute service and by $75,000 for 15-minute service. Conversely, cutting Saturday service to 10 hours a day would decrease annual costs by between $45,000 (10-minute headways) and $30,000 (15-minute headways).

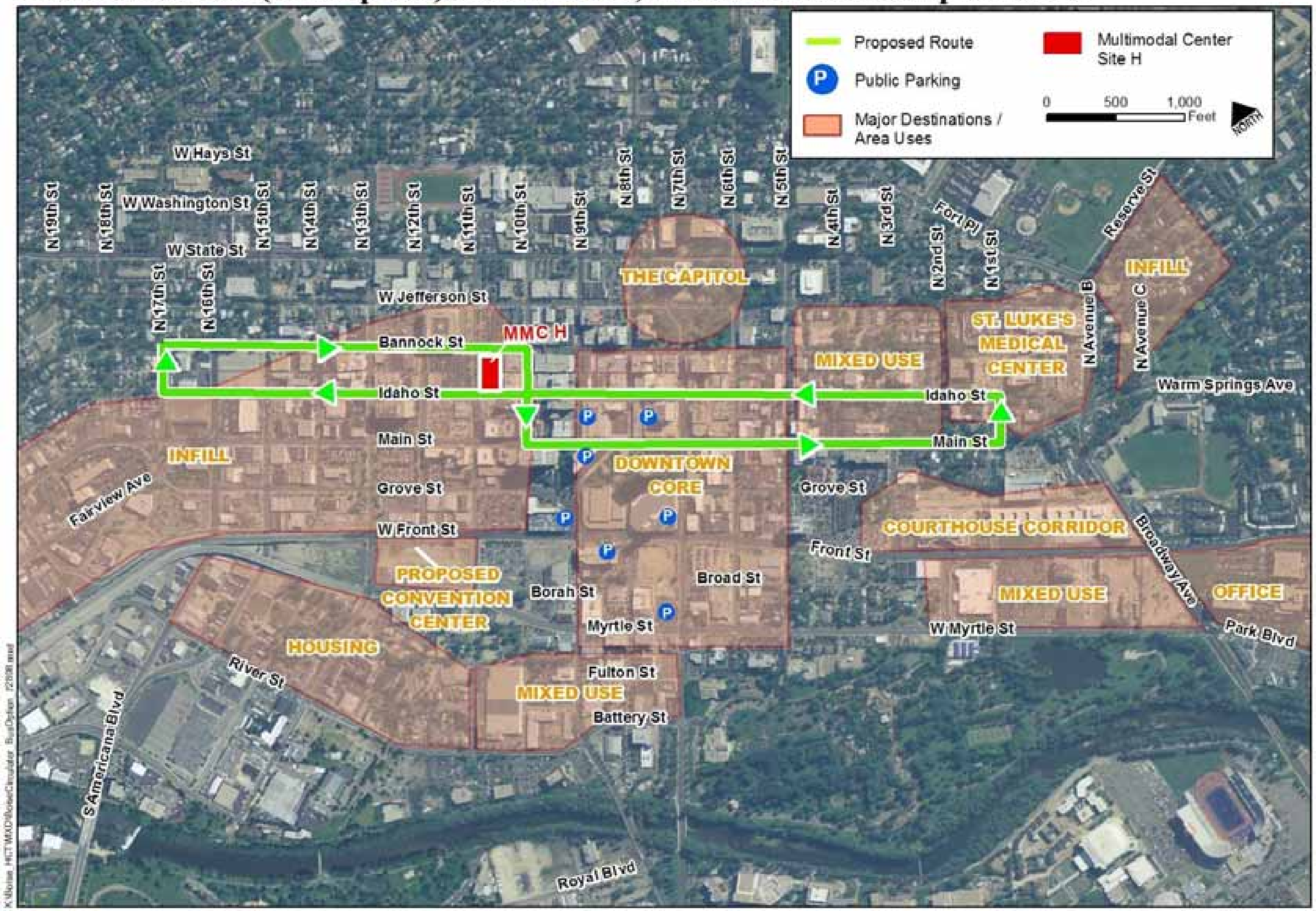
[1] VRT is attempting to provide more recent value

Table 5.3.1
Estimated Operating Costs
Main/Idaho, Idaho/Bannock Couplet Bus Option

Service Option	Roundtrip Mileage	Weekdays			Saturdays			Annual Revenue Hours	Annualized Operating Cost		Annual Operating Cost
		Num. of Vehicles	Revenue Hours	Operating Cost	Num. of Vehicles	Revenue Hours	Operating Cost		Weekdays	Saturdays	
Main/Idaho, Idaho/Bannock Couplet with 10 min Headway	2.6	3	45	$3,240	3	42	$3,024	13,479	$813,240	$157,248	$970,488
Main/Idaho, Idaho/Bannock Couplet with 15 min Headway	2.6	2	30	$2,160	2	28	$2,016	8,986	$542,160	$104,832	$646,992

APPENDIX A

Boise Circulator (Bus Option): Main/Idaho, Idaho/Bannock Couplet Route



URS

GIS Data Source: COMPASS, URS

APPENDIX B

Treasure Valley High-Capacity Transit Study
Downtown Boise Circulator - Bus Option
Order of Magnitude Capital Cost Estimate

Main/Idaho, Idaho/Bannock					All costs in 2008 dollars					
Item	**Cost Category**	**Quantity**	**Units**	**Unit Price**	**Subtotal**	**E&A %**	**E&A**	**Cont%**	**Unallocated Contingency**	**Summary Total**
1.0	Civil/Traffic Signals - Modified without arm replacement	3	EA	$20,000	$60,000	20%	$12,000	20%	$12,000	$84,000
1.1	Civil/Traffic Signals - New	2	TF	$175,000	$350,000	20%	$70,000	20%	$70,000	$490,000
2.1	Civil/Utilities/Bus Stop Improvement - Type 1	3	EA	$19,500	$58,500	20%	$11,700	20%	$11,700	$81,900
2.2	Civil/Utilities/Bus Stop Improvement - Type 2	5	EA	$22,500	$112,500	20%	$22,500	20%	$22,500	$157,500
2.3	Civil/Utilities/Bus Stop Improvement - Type 3	2	EA	$27,000	$54,000	20%	$10,800	20%	$10,800	$75,600
2.4	Civil/Utilities/Bus Stop Improvement - Type 4	2	EA	$35,000	$70,000	20%	$14,000	20%	$14,000	$98,000
2.5	Civil/Utilities/Bus Stop Improvement - Type 5	1	EA	$37,000	$37,000	20%	$7,400	20%	$7,400	$51,800
3.0	Bus Circ Vehicles (Assume 4 vehicles for starter system)	4	EA	$450,000	$1,800,000	5%	$90,000	5%	$90,000	$1,980,000
4.0	Right of Way (Allowance)	-	LS	$0	$0	0%	$0	20%	$0	$0
5.0	Maint. Facility Improvements (Allowance for existing VRT facility)	1	LS	$125,000	$125,000	20%	$25,000	20%	$25,000	$175,000
	Cost Summary				$2,727,000		$275,400		$275,400	$3,277,800

6.0	**Professional Services (Breakdown)**									
6.1	Preliminary Engineering	2.0%		$27,540						
6.2	Final Design	6.0%		$82,620						
6.3	Project Management for Designing and Construction	4.0%		$55,080						
6.4	Construction Administration & Management	4.0%		$55,080						
6.5	Insurance	0.0%		$0						
6.6	Legal; Permits; Review Fees by other agencies, cities, etc.	1.5%		$20,655						
6.7	Surveys, Testing, Investigation, Inspection	2.0%		$27,540						
6.8	Start-up Costs & Agency Force Account Work	0.5%		$6,885						
6.0		20.0%		$275,400						

Boise_BusCirc_CapitalCostEstimate_073108_fin.xls

URS Corporation
July 2008

September 8, 2008

Topic: Federal versus Local Funding - Boise Streetcar Project

Summary:

The Federal Transit Administration (FTA) has established a series of project categories for the funding of a range of "fixed guideway" transit projects. The overall program is referred to as the New Starts grant program. New Starts is a discretionary and competitive program, meaning jurisdictions throughout the U.S. desiring to utilize this funding source compete for use of what is a limited amount of funding authority. Proposed projects are evaluated against a set of established criteria and ranked in terms of the ability to meet certain thresholds. For the category of projects a Boise Streetcar project would fall under, the time required to address the FTA requirements would most likely fall in the range of six to eight years, with no guarantee the end result would favorable to the funding of a project. There are currently in the range of 80 proposed streetcar projects nationally, none of which have successfully completed the process of securing FTA funding. The attached assessment of the potential of funding the proposed Boise streetcar project with FTA New or Small Starts funds concludes that, as the program is currently defined and administered, it is at best an extremely remote if not a nonexistent possibility. Given the above, the best option is to explore the possibility of securing sufficient local funding of the proposed project.

Staff Recommendation / Request:

The best option under current circumstances is to explore the possibility of securing sufficient local funding of the proposed project.

Implication (policy and/or financial):

The recommendation places the burden of securing sufficient funding for both capital and operating requirements of the project at the local level. All communities that have successfully advanced similar projects have done so with the use of a wide range of funding sources, including in some instances the use of non-5309 (FTA New Starts) federal funds that qualify as "local" funds.

Highlights:

None

More Information / Attachments:

Attachments - Potential Of Funding Of A Downtown Boise Streetcar Project

Contact - Bob Post, URS Project Manager at 503 948-7230

Federal Transit Administration (FTA)
Section 5309 Capital Investment Grant Program
(New Starts and Small Starts Grant Program)

Background

As the City of Boise considers the implementation of a streetcar alignment in the downtown area, the most critical consideration after the initial definition of the project is addressing the potential methods of funding the capital and operating costs of such a system. Each community that has advanced a project to this point of development have at some time explored the potential of use of the Federal Transit Administration (FTA) New Starts program to possibly fund a significant portion of the capital construction costs. This paper describes the FTA program and its potential application to the streetcar project under consideration in downtown Boise.

The Section 5309 Capital Investment Grant Program (New Starts) was established by Congress to assist local agencies to fund meritorious transit “fixed guideway” capital projects, including light rail, commuter rail, streetcar and bus rapid transit. This is a discretionary and competitive grant program, which means jurisdictions from throughout the nation desiring to secure funding from this program compete against each other, regardless of the size or location of the communities. The current program as authorized by Congress, includes a total of $12.8 billion for the New Starts program over the five year period running through FY 2009. Currently there is a balance of commitment authority of $1.1 billion remaining in the program against a list of project requests equaling many times this amount.

To manage the program FTA has established detailed guidance for the preparation of New Starts applications. The guidance includes extensive requirements regarding the technical analysis aimed at demonstrating the merits of proposed projects. FTA’s guidance includes standard templates for reporting the variety of data used by FTA to compare and rank project applications. FTA staff works closely with each applicant to ensure that the analysis is prepared in a consistent manner to allow projects to be compared with other applications from across the country.

Project Categories

There are three project categories under the overall New Starts umbrella:

- **Very Small Starts –** Projects with total capital cost of less than $50 million and less than $3 million per mile (excluding vehicles).
- **Small Starts** - Projects with a total capital cost of less than $250 million with no greater than $75 million requested in federal 5309 funding. Small Starts must have at least 50% of the project length in a fixed guideway or be a corridor BRT project with substantial stations, signal priority, low-floor vehicles, 10-minute peak frequency and at least 14 hours of service per day. This is the category an initial segment streetcar project in downtown Boise would most likely fall under.

- **New Starts –** Projects with a total capital cost of more than $250 million. The term "New Starts" refers to this specific funding category, but it is also used to refer to the overall Section 5309 Capital Investment Grant Program.

Funding

The 5309 Grant Program is authorized to fund up to 80% of a project's capital cost, however, FTA has rarely provided more than 60% funding for recently approved projects and has expressed a strong preference that projects request no more than 50% federal funding.

Project Ranking

Because New Starts is a competitive grant program, FTA has developed a method for comparing and ranking each submitted project. A project must receive at least a medium ranking in the following categories to be considered for funding:

- **Cost Effectiveness –** Project cost effectiveness is measured using a formula developed by FTA known as cost per hour of transportation system user benefit (TSUB). This measure is calculated using a travel demand model to compare a proposed project with a Baseline Alternative. To perform well with this measure, the proposed project needs to show improved travel time for transit system users in the corridor. Given the nature of streetcar circulator projects in downtown environments it is extremely difficult, if not impossible, to secure a medium ranking in this category.
- **Land Use –** There are three categories of land use evaluation; 1) existing land use, 2) transit supportive plans and policies, 3) past performance of transit supportive policies. To perform well in this measure there needs to be substantial existing and planned densities within the corridor, existing transit-supportive land use policies in place and a demonstrated history of success in implementing transit-supportive land use policies.
- **Local Financial Commitment –** To perform well in this category, potential sources of local funding must be identified and must be considered to be potentially feasible. Local funding does not need to be fully committed at the early stages of project planning, but increasing commitment to a funding plan is expected as a project proceeds from early planning into more detailed design. Before entering into a grant agreement, the FTA also requires the identification of a source of funding to support the ongoing operations of the project.

The methods used to apply the above evaluations vary by project category and include the following:

- **Very Small Starts –** If a project can meet certain criteria (at least 3,000 daily existing transit riders in the corridor, less than $50 million total cost and less than $3 million per mile) it is automatically assigned a medium ranking for cost effectiveness and land use.
- **Small Starts -** Cost-effectiveness ranking is based on travel demand model analysis of the projected opening year rather than a 20-year forecast. The land use analysis requires slightly less detail than for New Starts.

- **New Starts –** The most rigorous project analysis is required for this category. Cost-effectiveness is based on a 20 to 25-year travel demand model forecast using adopted regional plans. The land use and economic development elements require a more extensive analysis than Small Starts category.

Project Timelines

The FTA has published a typical schedule for projects to advance through the New Starts process. The schedule is for general guidance only and is based on the experience of numerous projects that have used the 5309 funding mechanism. From the completion of an FTA acknowledged planning program and initiation of a formal Alternatives Analysis process to the initiation of service requires from six to twelve years. For larger projects, the rule of thumb is 10 years. For Small Starts projects, the timeline can in theory be shortened with a range of four to eight years more typical, provided the region has in hand an FTA acknowledged travel demand model.

Applicability of the Program to the Downtown Boise Circulator Project

The currently defined initial segment circulator project using streetcar technology on a Main/Idaho, Idaho/Bannock alignment would fall under the Small Starts FTA category. This would represent some advantages compared to pursuing a project under the full New Starts category in terms of the timelines involved and the rigor of the evaluation process. However, to date the application of the assessment process has not been favorable to streetcar projects and in fact demonstrates some level of a bias towards bus-based projects. The following are key areas of consideration in making a decision regarding whether or not to pursue FTA funding of an initial segment streetcar circulator in downtown Boise:

> Timeline - Most all communities pursuing FTA funding under the New Starts program for the first time find themselves towards the upper end of the estimated timelines provided by the FTA. A significant element of the required time is the development of a ridership model that meets FTA's requirements. This has proven to be a major issue and source of delay, even for communities that have previous successful experience with the FTA New Starts processes. Meeting the City of Boise's desired four-year implementation schedule would be highly improbable given the steps remaining to secure FTA's commitment to the funding of the project.
>
> Competition - As mentioned previously, the New Starts program is a discretionary and competitive program. In this case the Boise Streetcar project would compete with a long list of other projects for what is a relatively small program authorization (the Small Starts program has authorizations in the amount of $200 million annually under the current program). There are approximately 80 streetcar projects identified nationally, of which approximately half are in some level of planning or design. However, the primary competition for the Small Starts funds is not other streetcar projects, it is Bus Rapid Transit (BRT) projects that enjoy a competitive advantage in how the Small Starts program currently evaluates and ranks projects. Almost all of the currently committed

Small Starts funding is for BRT projects and to date no streetcar projects have received a grant agreement under the program.

Level of Effort - In addition to the time involved in the preparation of a Small Starts application, it is important to recognize that a considerable amount of resources are required at all levels to successfully complete the process. In addition to the staff, management and policy-level time, some components of the process will require significant investments of dollars. An example is the development of a ridership model that will meet FTA requirements for the level of detailed assessment required to rank the projects. Most communities without a current FTA acknowledged model have experienced expenditures in the hundreds of thousands of dollars for model development, data collection and calibrating to meet the strict demands of the FTA process.

Likelihood of a Positive Result - Often forgotten in the discussion of whether or not to pursue the use of federal funds for any New or Small Starts projects is that this is truly a discretionary program and that after the expenditure of significant dollars and time, the answer can simply be….No! A negative response might not even be a function of whether or not the project is deemed a good project from a federal perspective, it can simply be a function of other projects in line for a limited funding source have been ranked somewhat higher.

Conclusion

The likelihood of securing FTA funding under the currently defined New or Small Starts programs within the desired timelines for advancing a Boise streetcar project to implementation are at best extremely remote and most likely nonexistent. If the potential exists to secure local or local/non-5309 federal funding sources to fund the initial streetcar project, the best advice is to pursue that option.

To the degree the current project is viewed as an initial investment in what would eventually be an expanded system, the City and its partner jurisdictions should consider becoming active participants in helping reshape the next authorization bill. Numerous communities with similar interests supported the initial intent of the Small Starts program to provide a streamlined process that provides a level playing field for the full range of transit projects, including streetcars, that communities such as Boise may wish to pursue.

Item 5

Treasure Valley High Capacity Transit Study
Meeting Schedule, Agenda & Action Items

Date	Committee	Agenda Items	Action Items
October 6, 2008	**DTAC/DPAC Mailout**		
October 13, 2008 8:30 - 10:30 a.m. 10:30 – 11:30 a.m.	**DTAC** **Exec. Workgroup**	• Hold for possible meeting	
October 13, 2008 3:30-5:30 p.m.	**DPAC**	• Hold for possible meeting	
November 3, 2008	**DTAC/DPAC Mailout**		
November 10, 2008 8:30 – 10:30 a.m. 10:30 – 11:30 a.m.	**DTAC** **Exec. Workgroup**	• Review recommended Acquisition/Lease Agreement (MMC)	**Adopt Acquisition/Lease Agreement (MMC)**
November 10, 2008 3:30 – 5:30 p.m.	**DPAC**	• Review recommended Acquisition/Lease Agreement (MMC)	
November 19, 2008	**VRT Board Meeting**	• Review recommended Acquisition/Lease Agreement (MMC)	**Authorize VRT Mgmt. Committee to ratify the Acquisition/Lease Agreement (MMC)**
December 1, 2008	**VRT Management Committee**	• Review recommended Acquisition/Lease Agreement (MMC)	**Adopt Acquisition/Lease Agreement and authorize forwarding to FTA for**

MMC – Downtown Boise Multimodal Center DBC – Downtown Boise Circulator PC – Priority Corridor

Date	Committee	Agenda Items	Action Items
			approval
December 1, 2008	**DTAC/DPAC Mailout**		
December 8, 2008 8:30 – 10:30 a.m. 10:30 – 11:30 a.m.	**DTAC** **Exec. Workgroup**	• Hold for possible meeting	
December 8, 2008 3:30 – 5:30 p.m.	**DPAC**	• Hold for possible meeting	
December 25, 2008			**FTA approves acquisition/ lease terms**
January 2009			**Initiate Final Design (MMC)**
January 2009			**Open House; review of design options (MMC)**

MMC – Downtown Boise Multimodal Center DBC – Downtown Boise Circulator PC – Priority Corridor