facts

SUBWAY OVERVIEW FACT SHEET

APRIL 2002

Silicon Valley Rapid Transit Corridor
2000 Measure A Project

BART to Milpitas San Jose Santa Clara

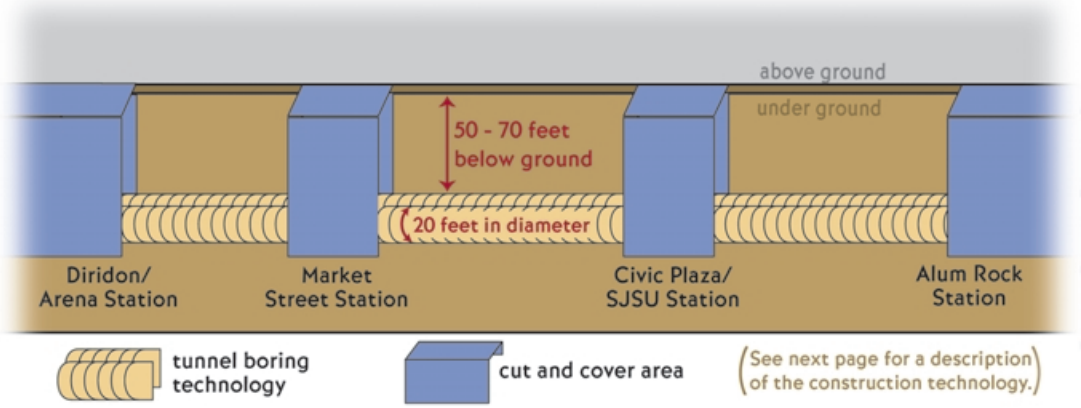
DOWNTOWN SAN JOSE SUBWAY
Options Under Consideration

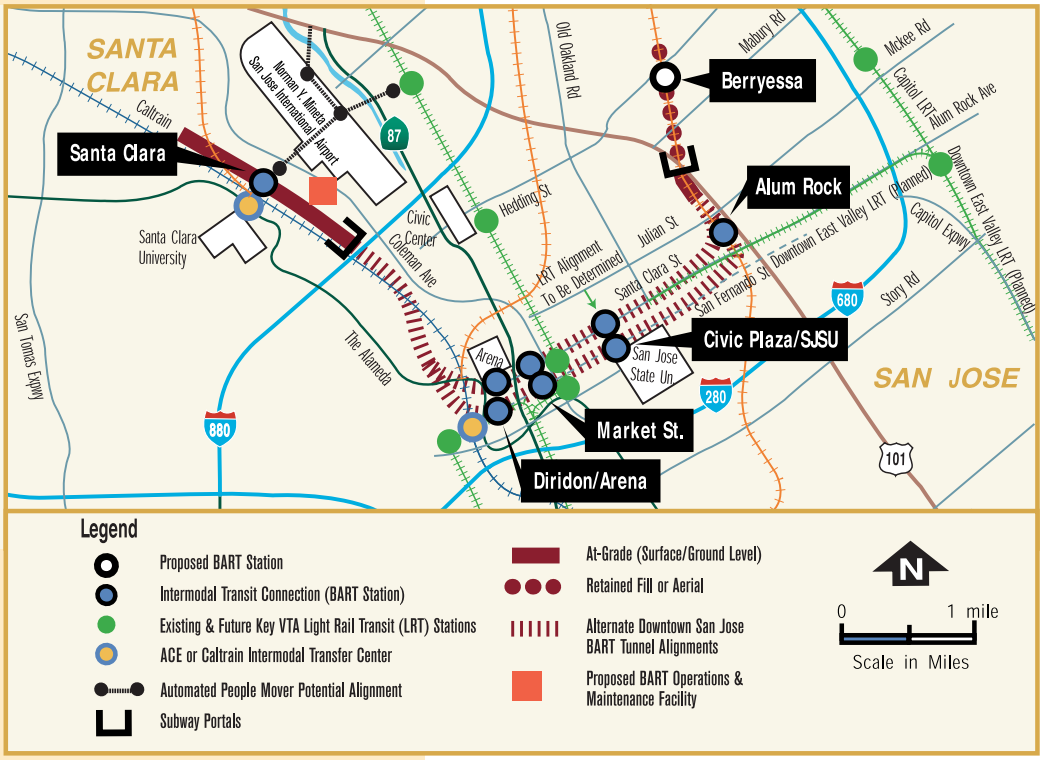
BART EXTENSION TO MILPITAS, SAN JOSE AND SANTA CLARA

The Santa Clara Valley Transportation Authority (VTA) is proposing to make transportation improvements in the Silicon Valley Rapid Transit Corridor by extending BART to Milpitas, San Jose and Santa Clara. VTA and the Federal Transit Administration (FTA) will be preparing an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) that will evaluate the impacts of constructing and operating the extension.

The proposed BART Extension to Milpitas, San Jose and Santa Clara includes a 4.5-mile subway extending from East San Jose into Downtown San Jose. Two circular tunnels, each about 20 feet in diameter, would be located approximately 50 to 70 feet below ground.

The subway tunnel would begin along the Union Pacific Railroad (UPRR) line just north of East Julian Street near Highway 101, proceed west into Downtown San Jose under either Santa Clara or San Fernando Streets, and emerge north of I-880 adjacent to the Caltrain tracks.



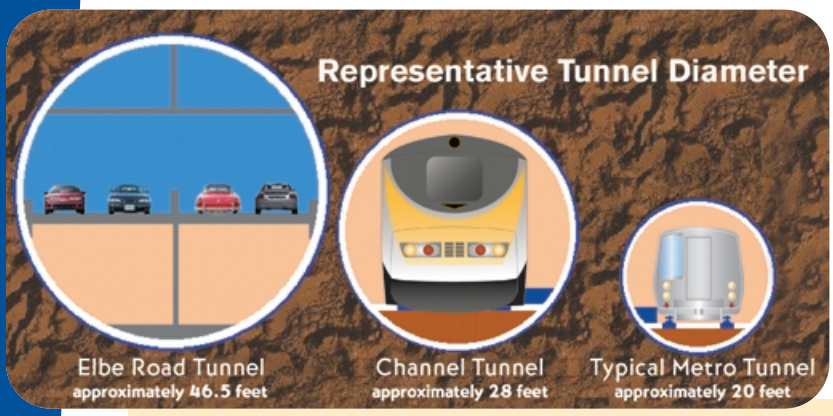


Four underground BART stations are proposed: Alum Rock, Civic Plaza/ San Jose State University, Market Street and Diridon/Arena. One option under consideration is the combination of the Civic Plaza/San Jose State University and Market Street Stations into a single station between Second and Market streets.

By summer 2002, VTA hopes to finalize the station and alignment options for inclusion in the project description that will be studied in the EIS/EIR. While no decision has been made about the underground alignment, VTA has begun to evaluate various subway construction methods that are described in this fact sheet.

Tunnel Boring Technology

For the Downtown San Jose subway section, VTA is considering using an Earth Pressure Balance (EPB) tunnel boring machine. The Earth Pressure Balance tunnel boring machine, greatly refined over the last 30 years, has contributed to improved safety, faster construction completion and fewer environmental impacts associated with tunnels, especially in soft ground conditions similar to those found in San Jose.



The tunnel boring machine is a proven technology that has been used successfully on many projects. In the past, tunnels were mostly constructed for water supply projects. Today tunnels are used for train subways, power cables, hydroelectric power, water transport, sewers and roadways. The rail and roadway tunnels listed below have a common feature; they were all built, or are being constructed, with Earth Pressure Balance tunnel boring machines.

Representative Tunnels Built Using Earth Pressure Balance Tunnel Boring Machines

country	tunnel name	date open	length
England/France	Channel Tunnel	1994	31 miles
US/Canada	St. Clair River Tunnel	1995	1.1 miles
Denmark	Storebaelt Rail Tunnel	1997	5 miles
Japan	Trans Tokyo Bay Highway Tunnel	1997	5.9 miles
United States	Congress Heights Metro Tunnel Washington, DC	2001	2.9 miles
Canada	Toronto Sheppard Transit Tunnel	2002 (projected)	4 miles
Thailand	Bangkok MTR Subway	2003 (projected)	13.7 miles
Germany	Fourth Elbe Road Tunnel	2003 (projected)	1.6 miles

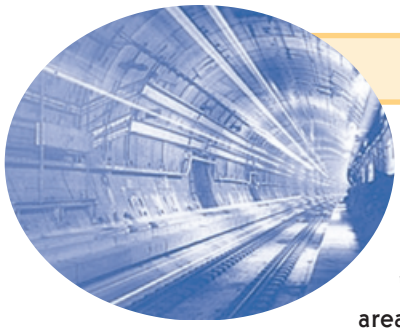
The BART Transbay Tube and San Francisco Downtown Subway

The BART Transbay Tube and the tunnel sections under Market Street in downtown San Francisco were completed in the early 1970s before the advent of the Earth Pressure Balance technology. The BART subway in San Francisco was built using a combination of a tunnel boring machine and cut and cover construction. However, without the Earth Pressure Balance technology, BART used compressed air to counterbalance the underground water table and prevent the tunnel from collapsing. With this construction technology, the crews had to work in a pressurized environment similar to deep sea diving. Current technology allows crews to work in a more efficient, unpressurized environment, which reduces the time and costs of construction.

Subway Station Entrance

Proposed Downtown San Jose Tunnel (4.5 miles)

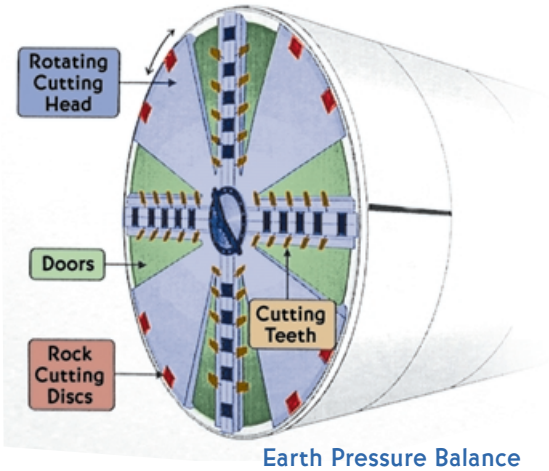
SECTION	APPROXIMATE LENGTH	TECHNOLOGY/CONSTRUCTION TYPE
East Portal Section	0.25 miles	Cut and Cover
Twin Bore Tunnel	3.5 miles	Earth Pressure Balance Tunnel Boring Machine
Each Subway Station: Alum Rock Civic Plaza/SJSU Market Street Diridon/Arena	900 - 1000 feet long	Cut and Cover
West Portal Section	0.25 miles	Cut and Cover



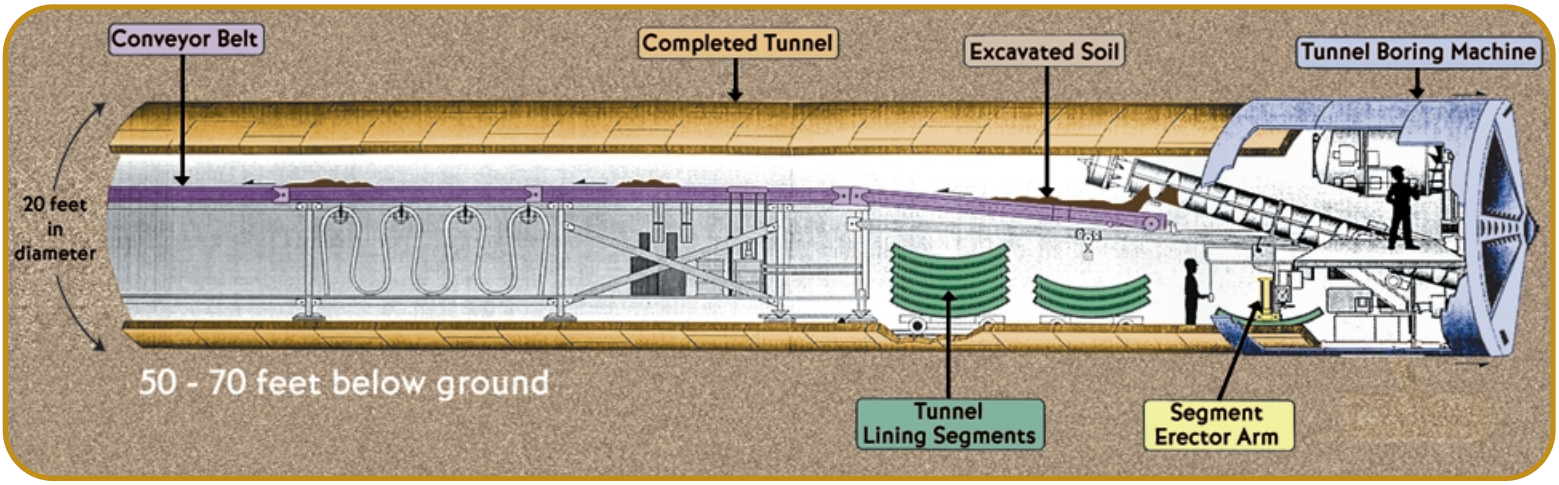
Earth Pressure Balance Tunnel Boring Machine

The Earth Pressure Balance tunnel boring machine operates primarily underground so there are minimal impacts on the surface to traffic and the surrounding community. Tunnel construction would be primarily visible only at the stations and openings at each end of the tunnel, known as portals. Both the subway portals for the Downtown San Jose tunnel will be located in industrial areas. (See back page for information on environmental studies.)

The Earth Pressure Balance tunnel boring machine cuts the earth with a front rotator cutterhead that transfers dirt onto a conveyor belt and into a cart for removal at the tunnel portal. As the machine makes its way through the soil and rock it also places the pre-cast concrete lining that forms the sides of the tunnel. Forward pressure along with a system to balance internal and external pressure keeps water and mud from seeping into the tunnel and minimizes surface settlement. The earth of the valley floor underneath Downtown San Jose is expected to be good for tunneling because it consists mainly of sand, silt, clay and gravel. An Earth Pressure Balance machine can tunnel approximately 50 feet per day and the work can be accelerated by the use of more than one machine.



Earth Pressure Balance Tunnel Boring Machine



Station and Portal Construction Technology

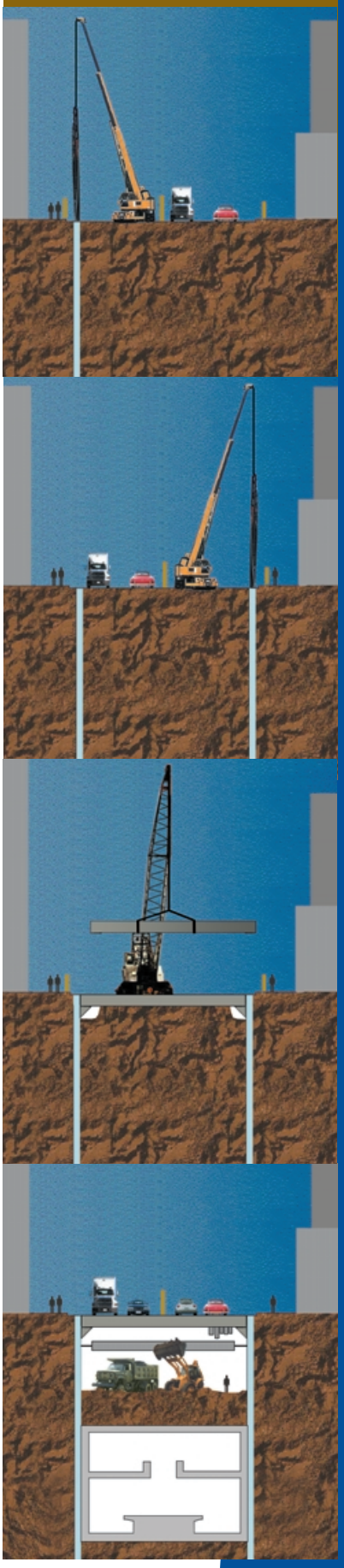
The cut and cover method will most likely be used for station and portal construction. Cut and cover construction, as the name suggests, involves construction from the street level down with the subsequent covering of the opening to allow activity to resume on the street level. Holes are bored on the boundaries of the construction, for example on the sides of a station box. Each hole is filled with a long steel or concrete column that will support the cover or deck. After the columns are in place, the road surface and the first layer of earth is removed. Next, horizontal steel beams are placed across the area, between the support columns. Decking is installed that is used to carry the road traffic during construction. Station construction continues under the support deck.

For the Downtown San Jose subway, construction will be visible where cut and cover construction is used at the tunnel portals and the stations. (See back page for information on environmental studies.) Because cut and cover construction has a street level element there may be temporary road closure and re-routing of traffic. VTA would focus on minimizing impacts such as interruption of traffic, dust and noise, and maintenance of auto and pedestrian access at key locations. Construction work would be staged so that inconvenience to traffic, pedestrians and businesses is minimized to the greatest extent possible.

Ticket Area of a Subway Station

Tunnel Portal Example

Cut and Cover Construction Sequence



Construction of support wall on one side of the street.

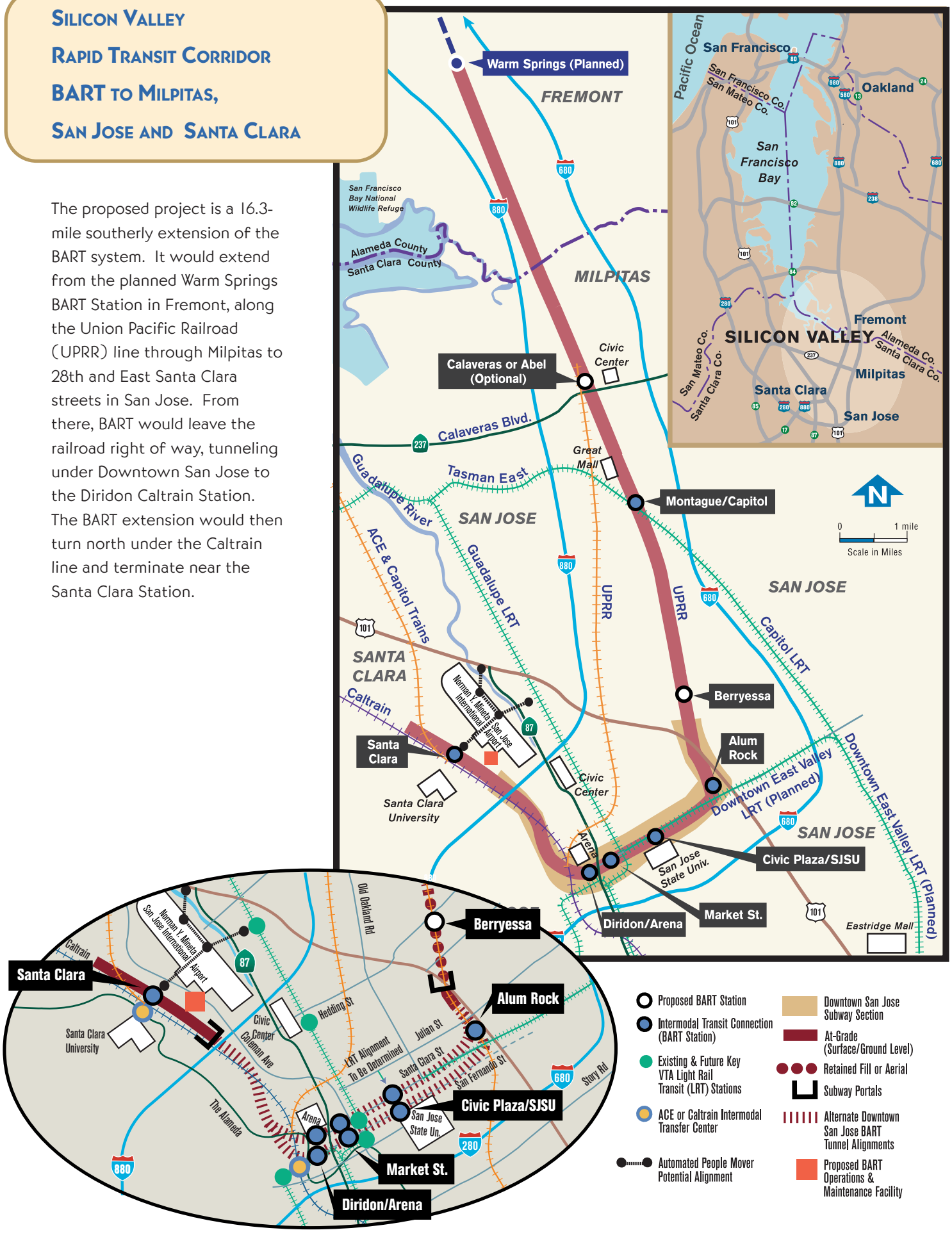
Construction of support wall on the other side of the street.

Placement of deck beams for the entire width of the street.

Restore traffic on the completed deck and continue station construction below deck.

Silicon Valley Rapid Transit Corridor BART to Milpitas, San Jose and Santa Clara

The proposed project is a 16.3-mile southerly extension of the BART system. It would extend from the planned Warm Springs BART Station in Fremont, along the Union Pacific Railroad (UPRR) line through Milpitas to 28th and East Santa Clara streets in San Jose. From there, BART would leave the railroad right of way, tunneling under Downtown San Jose to the Diridon Caltrain Station. The BART extension would then turn north under the Caltrain line and terminate near the Santa Clara Station.



Environmental Studies will provide information on the impacts of the Proposed Tunnel Section

Preparation of environmental studies for the BART Extension project began in January 2002 and the Draft Environmental Impact Statement/Environmental Impact Report is scheduled for release in February 2003. The studies will identify impacts of tunneling and cut and cover construction for both the construction period and for the long-term operations.

Environmental studies will be conducted on the Downtown San Jose tunnel section to address the potential for noise and vibration impacts, hydrology and groundwater impacts, geological and seismic impacts and general neighborhood impacts. The environmental analyses will also address other project impacts related to traffic and parking, socioeconomic and environmental justice, land use, energy, air quality, biology, hazardous materials, cultural resources and visual/aesthetics.

Targeted Project Shedule

Jan 2002	Initiated Environmental Process
Jun 2002	Approve Project Description for EIS/EIR
Feb 2003	Release Draft EIS/EIR
Oct 2003	VTA Board Certifies Final EIR FTA Approves Record of Decision

VTA - Working for the Community

VTA strives to be a friendly neighbor and will work closely with the community to reduce the impacts of construction. Access to homes and businesses with minimal surface disruption are top priorities. Construction phasing and methods utilized will emphasize access, safety, traffic circulation, and the needs of the community.

Public Involvement

Public involvement is an important part of the environmental study, design and construction process. VTA will continue to conduct an extensive outreach effort to coordinate with interested parties, key public agencies, and the general public. Multiple opportunities will continue to be available to ensure public dialogue occurs during the study process. Some of these opportunities include public meetings and workshops, updates on VTA's website, newsletters and distribution of study documents for public review.

For additional information or to be added to the mailing list please contact VTA:

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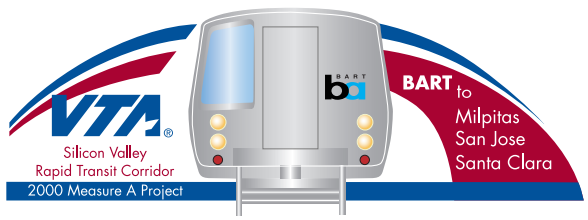

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