

SCENARIO "A" a TBM failure under a business district with the Gold Line running through it
South Pasadena at Mission Street and Meridian Avenue

South Pasadena with Gold Line tracks in foreground. Construction would break apart transit going north & south from here.



South Pasadena at Mission Street and Meridian Avenue

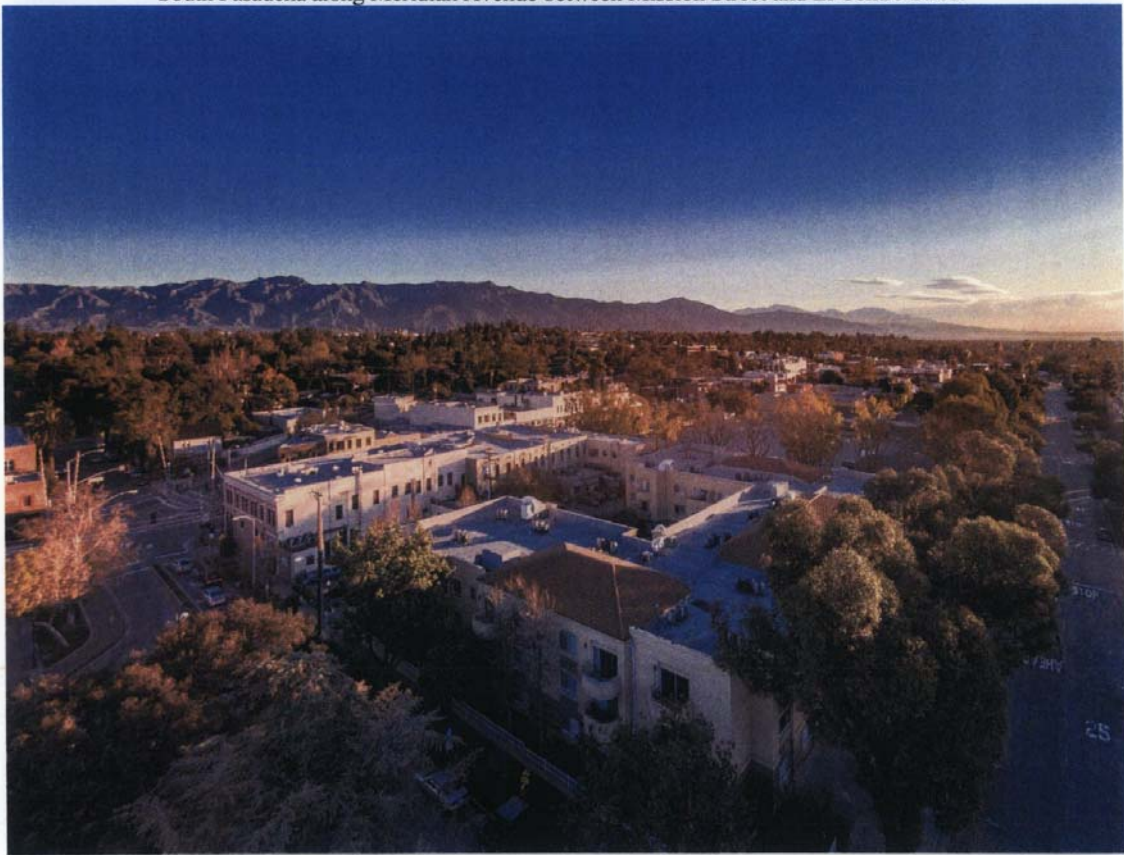
If the TBM broke down under the tracks, the red outlines show the access pit and crane construction area.



SCENARIO "A" a TBM failure under a business district with the Gold Line running through it

BEFORE A TBM BREAKDOWN

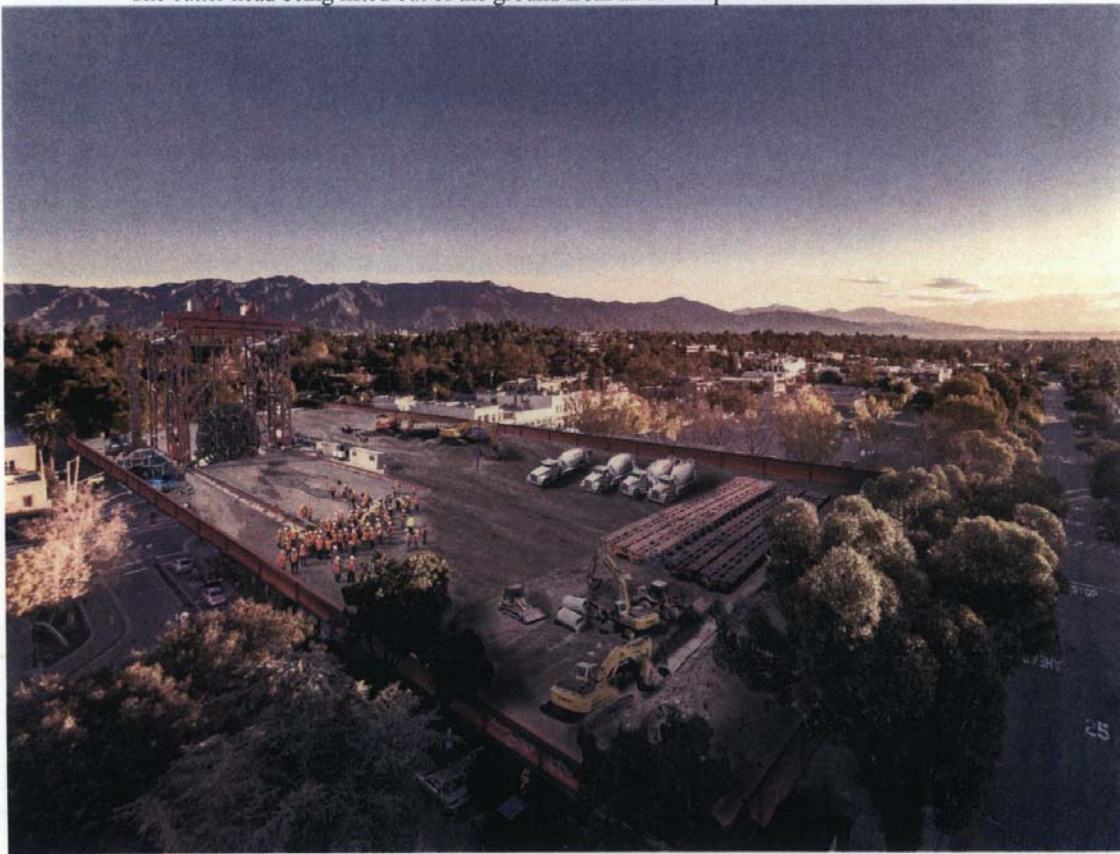
South Pasadena along Meridian Avenue between Mission Street and El Centro Street



SCENARIO "A" a TBM failure under a business district with the Gold Line running through it

AFTER A TBM BREAKDOWN

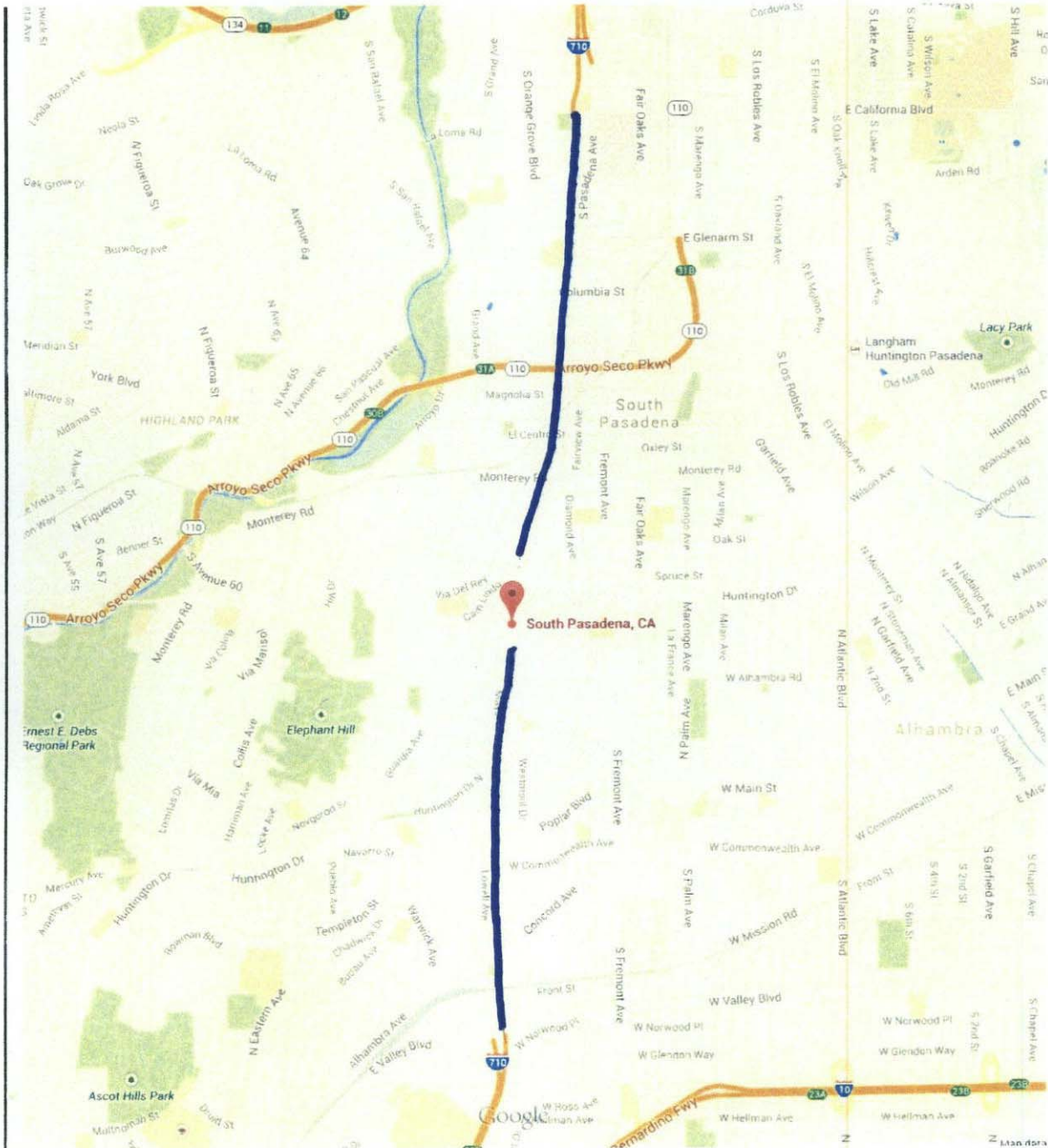
The cutter head being lifted out of the ground from an access pit inside a construction area.



3. Descriptions and illustrations of TBM rescue and repair operations in South Pasadena and El Sereno

SCENARIO "B" TBM in a high elevation & sloped neighborhood

South Pasadena residential area at Alpha Avenue and Fremontia Street
This map shows SR-710 tunnel route in BLUE.
The pink exclamation point shows the second example of a breakdown location.

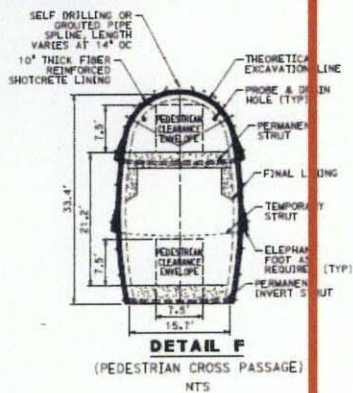


3. Descriptions and illustrations of TBM rescue and repair operations in South Pasadena and El Sereno

SCENARIO "B" TBM in a high elevation & sloped neighborhood

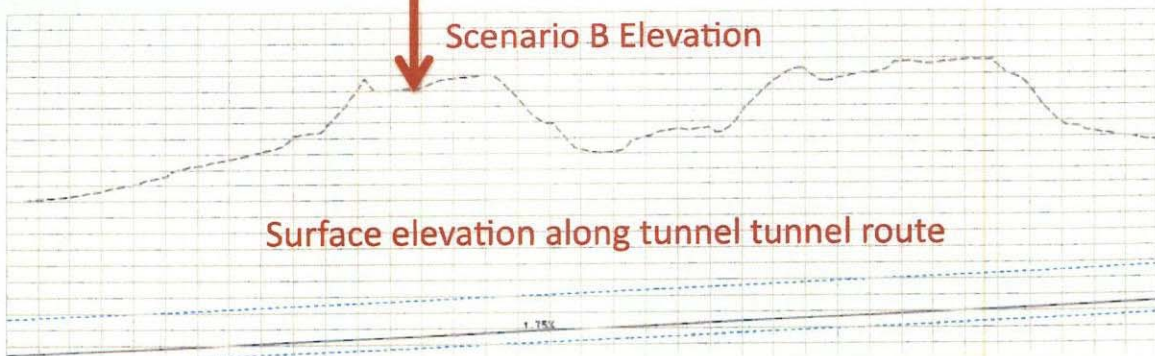
South Pasadena residential area at Alpha Avenue and Fremontia Street

This map shows the twin tunnel route and its hilly neighborhoods above it.



LEGEND:

- BRIDGE
 - CUT & COVER TUNNEL
 - TUNNEL BORING MACHINE (TBM)
 - PAVEMENT
 - TUNNEL CROSS PASSAGES
 - HISTORIC PROPERTY
 - DISTURBANCE LIMIT LINE (DLL)
- | CURVE DATA | | |
|------------|-----|-----------|
| Alignment | No. | R |
| "A" LINE | (1) | 20100.00' |



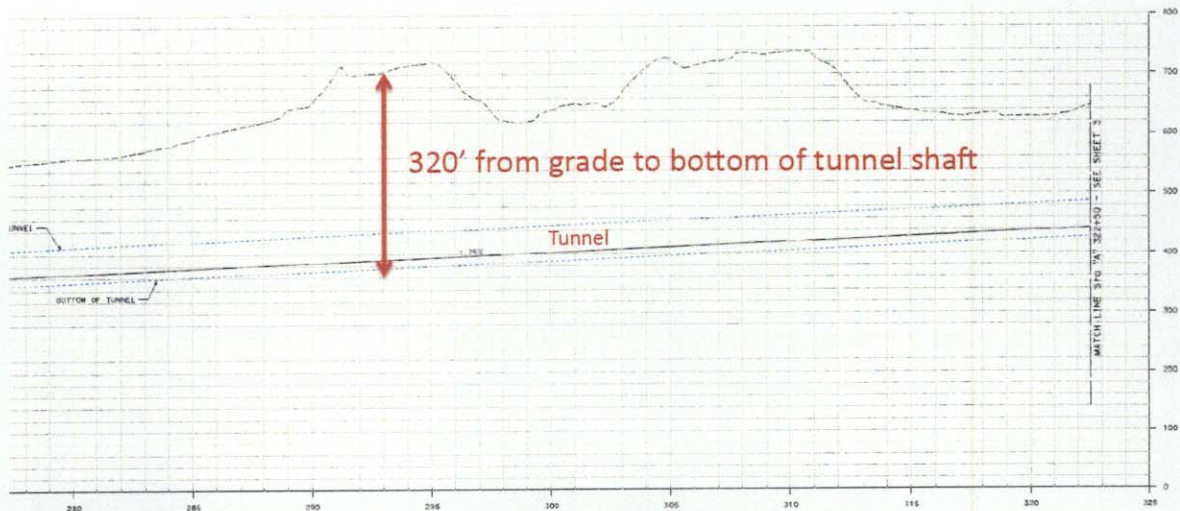
From CalTran/Metro's Freeway Alternative F-7 Conceptual Design

3. Descriptions and illustrations of TBM rescue and repair operations in South Pasadena and El Sereno

SCENARIO "B" TBM in a high elevation & sloped neighborhood

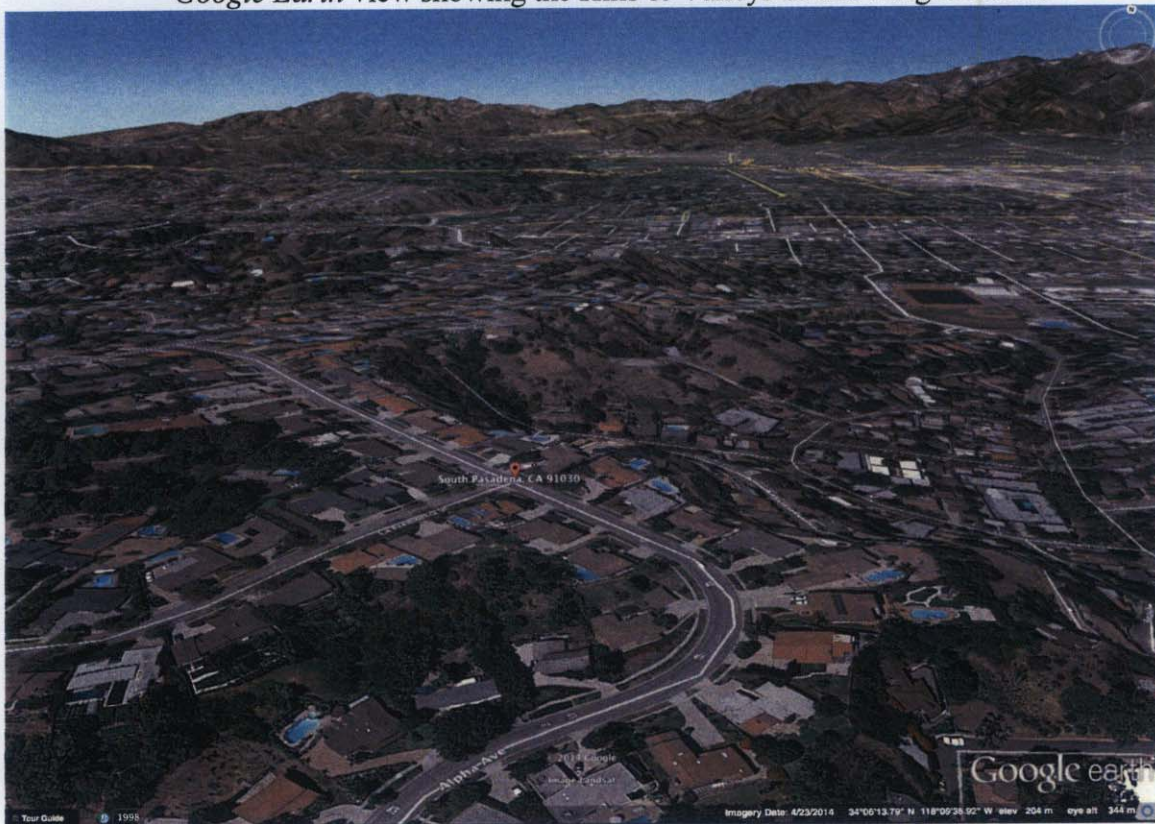
South Pasadena residential area at Alpha Avenue and Fremontia Street

If one of the tunnel boring machines broke down under these streets, and if an access pit needed to be excavated to reach the stalled TBM, the 80 foot diameter hole would have to go down 320 feet. Is this rescue procedure feasible?



From CalTran/Metro's Freeway Alternative F-7 Conceptual Design

Google Earth view showing the Hills & Valleys of this Neighborhood



Descriptions and illustrations of TBM rescue and repair operations in South Pasadena and El Sereno
SCENARIO "B" TBM in a high elevation & sloped neighborhood

Because of steep drop-offs, as close as 250' from the edge of Alpha Avenue, a crane construction area has very little space to operate and none of it is flat. A breakdown in this neighbor would demand leveling the grade (if economically and technically feasible), realigning the lift rails away from the access pit, trying to fix the TBM underground or abandoning the failed boring machine altogether. If an excavation area is opened to fix a stalled TBM, many La Fremontia and Alpha Avenue's homes would need to be demolished to create a construction site.



Descriptions and illustrations of TBM rescue and repair operations in South Pasadena and El Sereno
SCENARIO "B" TBM in a high elevation & sloped neighborhood

Corner of Alpha Avenue and La Fremontia looking North West on Alpha Avenue – an UPHILL slope



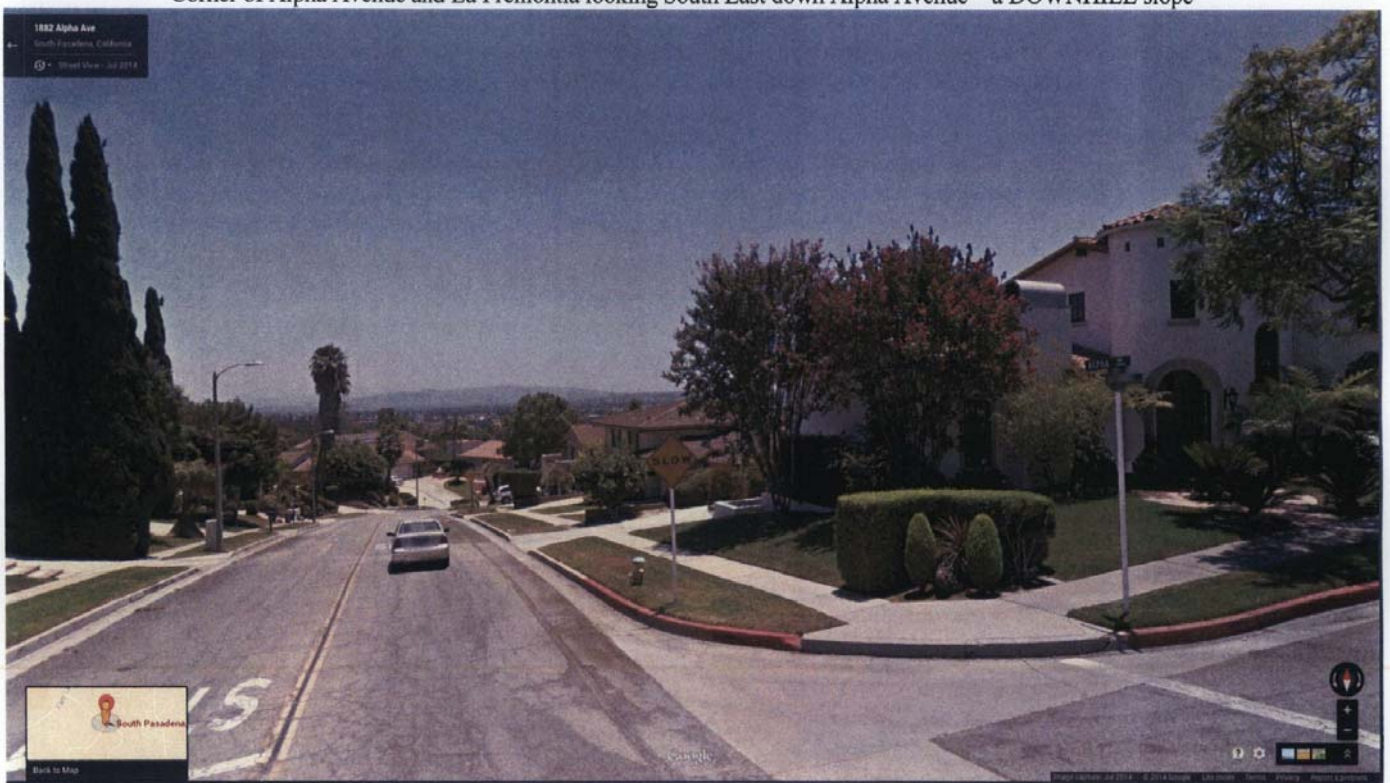
Descriptions and illustrations of TBM rescue and repair operations in South Pasadena and El Sereno
SCENARIO "B" TBM in a high elevation & sloped neighborhood

Corner of Alpha Avenue and La Fremontia looking South West onto La Fremontia – an UPHILL slope



Descriptions and illustrations of TBM rescue and repair operations in South Pasadena and El Sereno
SCENARIO "B" TBM in a high elevation & sloped neighborhood

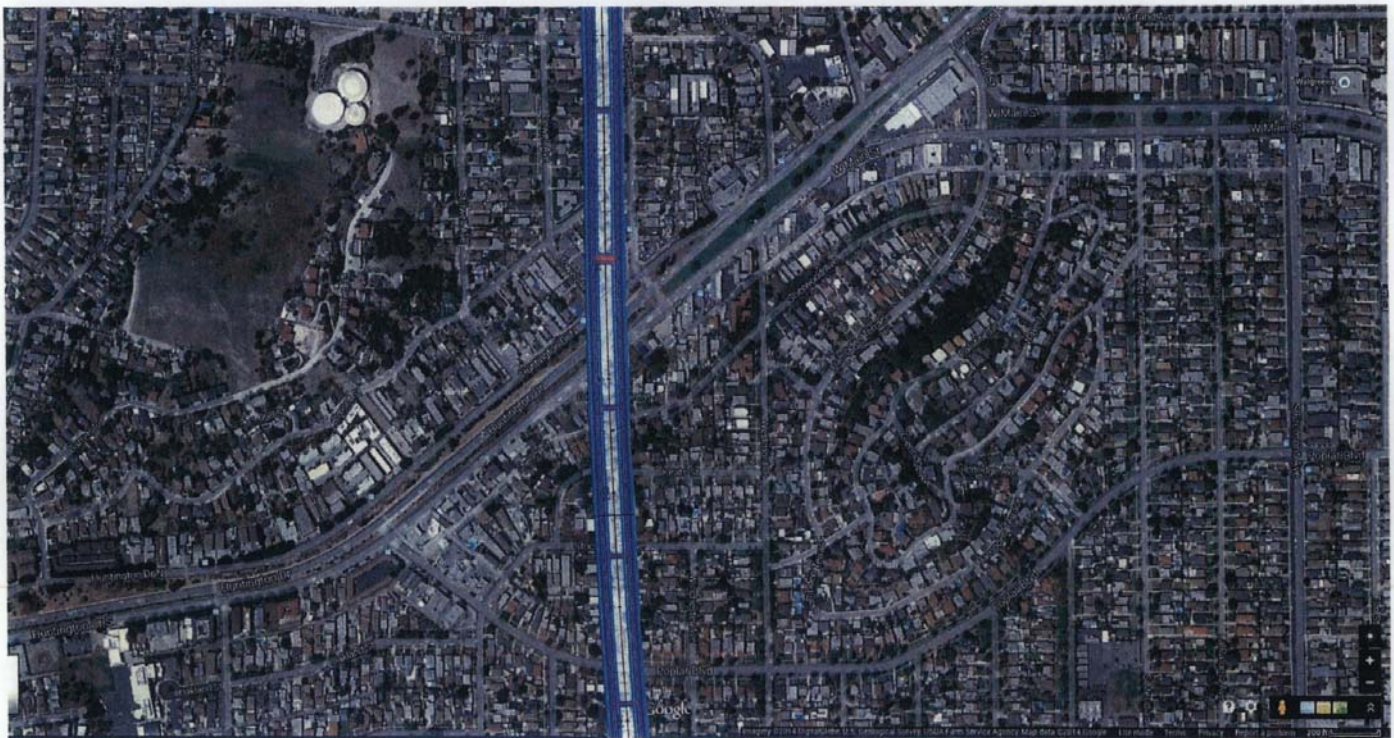
Corner of Alpha Avenue and La Fremontia looking South East down Alpha Avenue – a DOWNHILL slope



Notice none of these streets have a flat grade. How can a giant modular lift operate on these inclined hills? Would they be leveled?

3. Descriptions and illustrations of TBM rescue and repair operations in South Pasadena and El Sereno
SCENARIO "C" TBM failure under a city thoroughfare near a hilly residential area
Los Angeles, Community of El Sereno at Huntington Drive and Lowell Avenue

Arial View of East El Sereno showing small businesses along Huntington Drive, its Residential Neighborhoods,
and the SR-710 Twin Tunnel Route



3. Descriptions and illustrations of TBM rescue and repair operations in South Pasadena and El Sereno
SCENARIO "C" TBM failure under a city thoroughfare near a hilly residential area
Los Angeles, Community of El Sereno at Huntington Drive and Lowell Avenue

Arial View of East El Sereno showing an example of a TBM breakdown and Associated Construction Area



3. Descriptions and illustrations of TBM rescue and repair operations in South Pasadena and El Sereno
SCENARIO "C" TBM failure under a city thoroughfare near a hilly residential area
Los Angeles, Community of El Sereno at Huntington Drive and Lowell Avenue

The Neighborhood within the Construction Area - Corner of Lowell Avenue and Keats Street looking East



Notice that Lowell Avenue slopes down as it forks left with Keats Street. All of this area would be graded flat to accommodate the hoisting lift if one is needed to replace or repair the TBM assemblies.

4. The transport routes for crane and replacement parts to the SR-710 breakdown zones

Looking down into Bertha's access pit with the TBM shield section removed for disassembly.



As stated earlier, Seattle's Alaska Way Viaduct tunnel project is referenced in this report because Bertha is a close example of the TBMs proposed for the SR-710 tunnels. Bertha clogged and was stopped with broken seals and a damaged main bearing in December of 2013. The seal ring is the same size as the cutting head diameter, 57.5 feet, and transporting such a wide piece of steel needs that much width of roadway to move it from Seattle's harbor to the access pit.

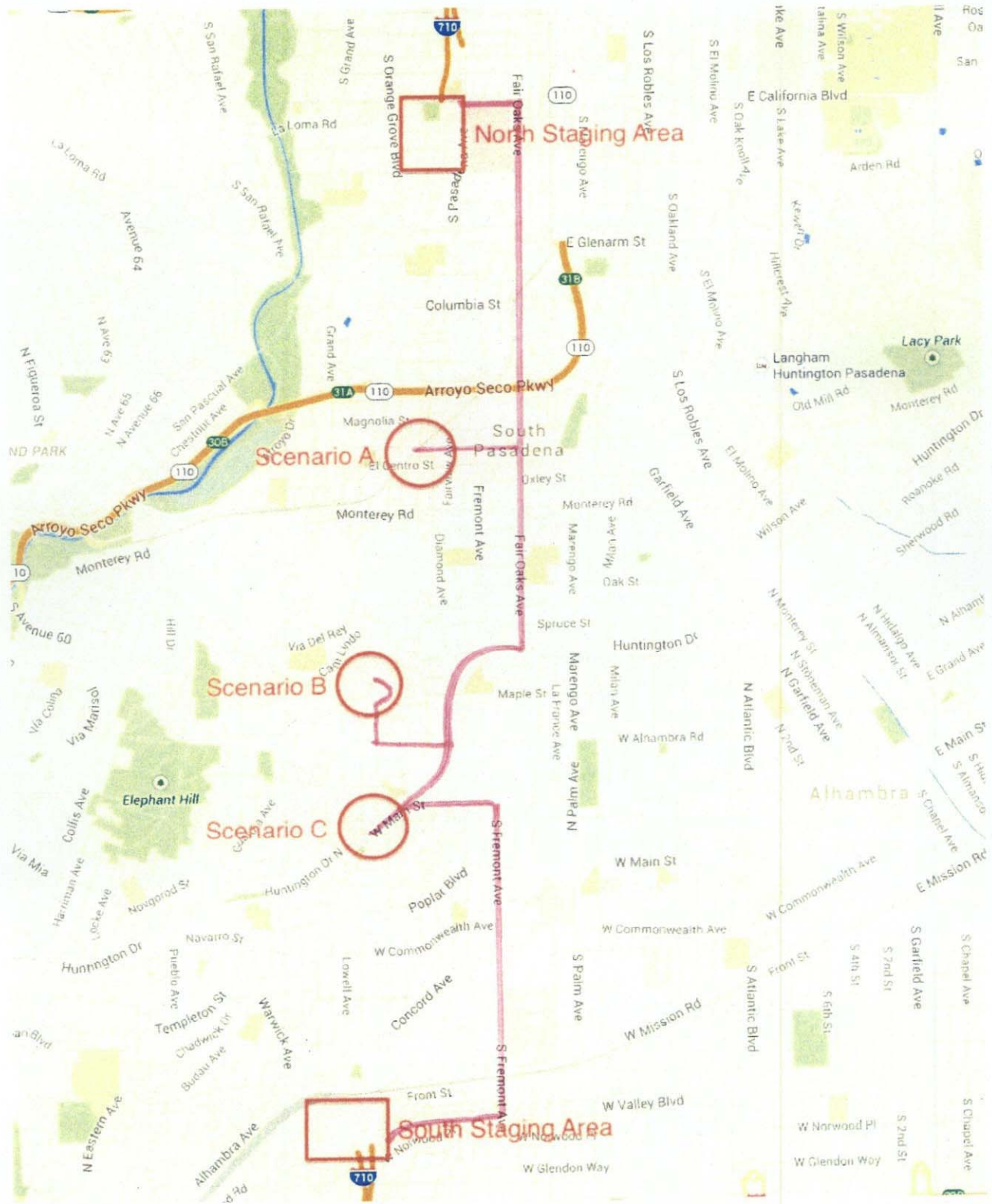
Seattle's access pit and construction area is adjacent to the Elliot Bay piers. But Bertha could have broken down under City University of Seattle and the Hyatt Place Seattle creating much more of a problem. If the SR-710 TBMs were to fail anywhere along the tunnel route it's likely that replacement parts and a giant crane would also be needed to fix them and go to wherever the access pits are located. This final section illustrates the three examples of breakdown areas and the streets needed to reach them with replacement parts.

We believe those parts and the cranes sections would be shipped to the North or South staging areas at the SR-710 tunnel entrances. From there they would be hauled via the widest streets in route – down Fair Oaks or up South Fremont and then east to scenario A, B or C excavation sites. The SR-710 TBMs would be the largest in the world with seal rings matching their 60' diameter cutting heads. As in Seattle, duel transport vehicles, approximately 100' long, would be needed to move these mammoth parts.

The footprint of the seal ring and duel trucks would be 100 feet long by 60 feet wide.

4. The transport routes for crane and replacement parts to the SR-710 breakdown zones

The following map shows the potential hauling course, highlighted in pink, from the north and south staging areas at the 710 stubs.



4. The transport routes for crane and replacement parts to the SR-710 breakdown zones

These photographs point to the immense size of Bertha's green cutting head, white replacement seal ring and the dual transport vehicles needed to move huge parts like this.



4. The transport routes for crane and replacement parts to the SR-710 breakdown zones

If you recall, the Space Shuttle required months of planning to move it through city streets to the California Science Center. Driving two transports 60' wide by 100' long would also be an extremely tight fit. In some places, they would not fit at all without modifications.

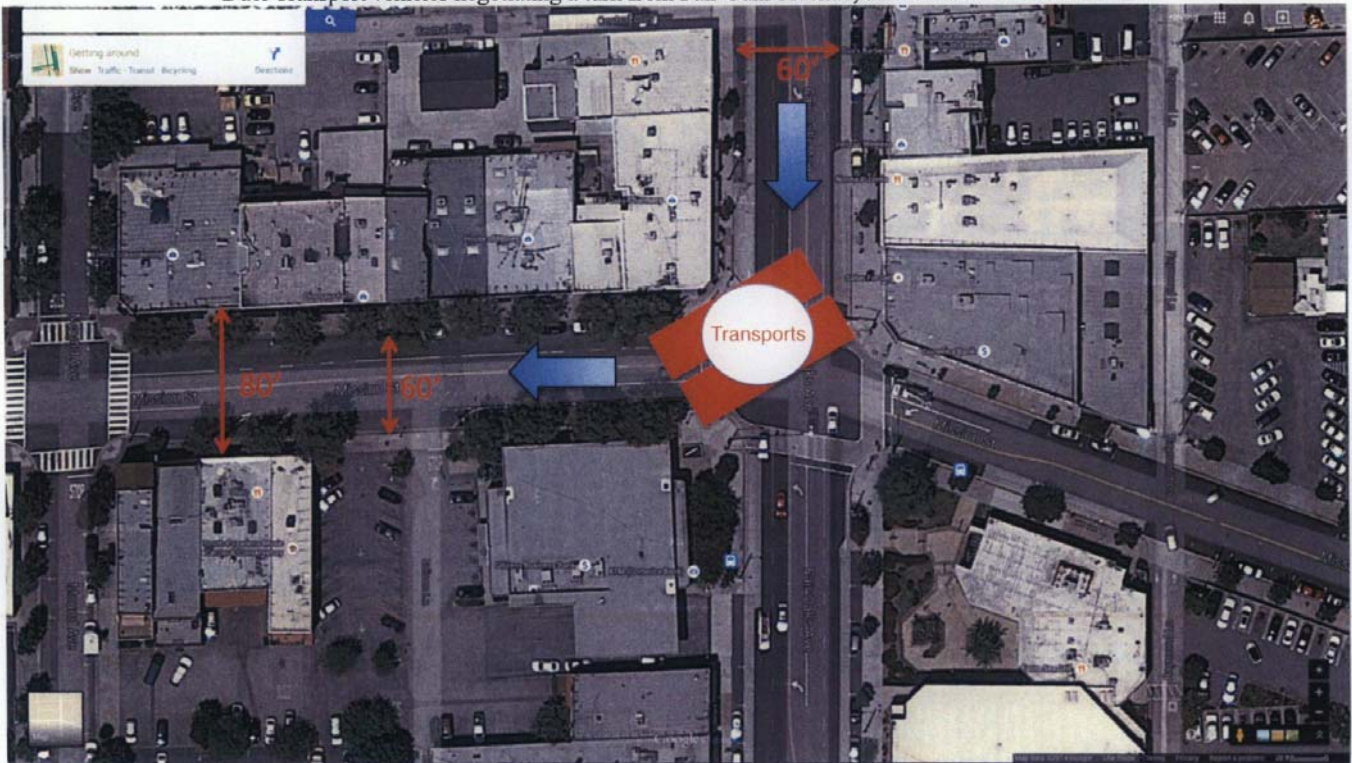


4. The transport routes for crane and replacement parts to the SR-710 breakdown zones

Scenario A – TBM Breakdown under Mission Street and Meridian Avenue

The aerial view with red overlays shows the scale of the duel transport vehicles carrying a sixty foot diameter seal ring to the breakdown location.

Duel Transport vehicles negotiating a turn from Fair Oaks Avenue, then east onto Mission Street



To allow more street width for the transports and ring seal, trees must be removed on Mission Street.

4. The transport routes for crane and replacement parts to the SR-710 breakdown zones

Scenario B – TBM Breakdown under Alpha Avenue and Fremontia Street

The aerial view with **red overlays** shows the scale of the dual transport vehicles carrying a sixty foot diameter seal ring to the breakdown location.

Dual Transport vehicles on Kendall Avenue approaching a right turn onto Alpha Avenue



Note the houses on the north and south sides of the red transports. There is not enough room to drive past them.

4. The transport routes for crane and replacement parts to the SR-710 breakdown zones

Scenario C – TBM Breakdown under Huntington Drive and Lowell Avenue

The aerial view with **red overlays** shows the scale of the duel transport vehicles carrying a sixty foot diameter seal ring to the breakdown location.

Duel Transport Vehicles heading towards a turn from West Main Street onto Huntington Drive



Another place where trees will be cut down.

In Conclusion

As stated on page one of this review, tunnel boring machines can breakdown and do breakdown. The table of worldwide bored tunnels shows that twelve out of seventeen projects experienced TBM failures, some causing huge cost and schedule overruns. As noted, rarely do environmental impact reports discuss the full ramifications of engineering and technical failures. But calamities do happen and often cause damage no government agency wants to discuss.

And so it came to pass that the Washington State Department of Transportation and its contractor, Seattle Tunnel Partners never mentioned the possibility of a tunnel boring machine failure to Seattle's City Council. Today those members are yelling, "Why weren't we told!"

Bertha broke down 1025 feet from its initial boring start. If a similar TBM stalled a 1000 feet from the SR 710 north portal, where do you think that would be?

BEFORE A TBM Breakdown



This is Huntington Memorial Hospital, a major trauma center and jewel of Pasadena. The SR 710 tunnels would run beside it, just west of Pasadena Avenue on the right side of this photograph.

In Conclusion

AFTER A TBM Breakdown



Half of **Markham Place Historical District** would be demolished, including the home of Pasadena Heritage. This is why CalTrans and Metro have downplayed the risk about tunneling failures.

But now you know the whole story. Now you know a 1,300 ton tower crane would be needed to lift a 2000 ton load of tunnel boring machine parts. Now you have the information you need to evaluate all the risks and environmental impacts of such a colossal venture.

Pasadena and South Pasadena TBM rescue simulations by Andre de Salis
Reviewed by Keith Schrader, Civil Engineer, P.E.
Reviewed by Sarah Gavit, Systems Engineer
Reviewed by Brett E. Nuckols, Civil Engineer, P. E.
Researched and compiled by Avram D. Gold

Jomsky, Mark

Subject: RE: April 13, 2015 City Council Vote No 710 Extension

From: F Hannan <freddiehannan@gmail.com>

Date: April 5, 2015 at 7:07:43 AM GMT+2

To: "bbogaard@cityofpasadena.net" <bbogaard@cityofpasadena.net>, "mmcaustin@cityofpasadena.net" <mmcaustin@cityofpasadena.net>, "vdelacuba@cityofpasadena.net" <vdelacuba@cityofpasadena.net>, "johnjkennedy@cityofpasadena.net" <johnjkennedy@cityofpasadena.net>, "smadicon@cityofpasadena.net" <smadicon@cityofpasadena.net>, "nsullivan@cityofpasadena.net" <nsullivan@cityofpasadena.net>, "district1@cityofpasadena.nettornek@cityofpasadena.net" <district1@cityofpasadena.nettornek@cityofpasadena.net>, "mbeck@cityofpasadena.net" <mbeck@cityofpasadena.net>

Cc: "mjomsky@cityofpasadena.net" <mjomsky@cityofpasadena.net>

Subject: April 13, 2015 City Council Vote No 710 Extension

Dear Mayor, Councilmembers and City Manager,

We are members of WPRA and SRNA, and we strongly oppose the SR710 Tunnel. We support the Working Groups recommendations and clearly understand that Measure A is moot.

We urge you to vote Against the 710 Tunnel and for the Working Group's recommendations.

We request the City Clerk put our notice on record for the April 13th City Council meeting and distribute a copy to all city council members.

Sincerely,
Mr and Mrs Edward Hannan
Pasadena

Jomsky, Mark

Subject: RE: Resolution for the City of Pasadena to oppose the SR-710 toll tunnel(s)

From: Steve Koch <ssventure@earthlink.net>

Date: April 6, 2015 at 5:43:37 PM MST

To: <bbogaard@cityofpasadena.net>, <mmcaustin@cityofpasadena.net>, <vdelacuba@cityofpasadena.net>, <johnjkennedy@cityofpasadena.net>, <smadison@cityofpasadena.net>, <nsullivan@cityofpasadena.net>, <district1@cityofpasadena.net>, <ttornek@cityofpasadena.net>, <mbeck@cityofpasadena.net>

Subject: Resolution for the City of Pasadena to oppose the SR-710 toll tunnel(s)

April 6, 2015

The Honorable Mayor and Councilmembers
City of Pasadena
100 N. Garfield Ave.
Pasadena, CA 91109

Dear Mayor Bogaard and Councilmembers:

My family urges you to support a resolution for the City of Pasadena to oppose the SR-710 **Tunnel** freeway. This disastrous proposal will increase traffic on our streets and surrounding freeways, add pollution, bring down property values and thereby destroy this gem of a city. For you to do anything other than oppose these tunnels will be an act of complicity in the destruction of Pasadena.

When Measure A was passed in 2001, we were not told that the proposed surface route "*free*" way would turn into a TOLL TUNNEL intended as a "*NATURAL GOODS CORRIDOR*" with no off-ramps, demonstrating it is intended as a bypass route to "*address the demands of commerce -- specifically goods movement from the twin ports of L.A. and Long Beach, the two busiest ports in the country, and goods movement from California's Central Valley, America's bread basket*" as stated in this 2011 Metro news release: http://www.metro.net/news/simple_pr/metros-highway-program-shifts-high-gear-18-new-pro/

Do not accept any of the intensional inferior alternative designs that Caltrans/Metro have offered. They have stacked the deck to push a destructive trucking route. Support instead the Pasadena Working Groups recommendations for viable solutions of mobility that will help, not destroy, the fabric of this community.

Sincerely,
Mr. & Mrs. Koch & family

Jomsky, Mark

From: Melissa <melmiamich@yahoo.com>
Sent: Sunday, April 05, 2015 10:59 AM
To: Jomsky, Mark
Cc: Bogaard, Bill; McAustin, Margaret; De La Cuba, Vannia; Kennedy, John; Madison, Steve; Sullivan, Noreen; district1; Tornek, Terry; Beck, Michael
Subject: Public comment for April 13 City Council: YES on Resolution to Oppose SR710 Tunnel

Dear Mr. Jomsky:

(Please ensure that my email gets on public record and also gets distributed to the City Council.)

I would like to respectfully ask that the City of Pasadena's City Council vote YES on a Resolution to **oppose the SR-710 Tunnel** and to carefully consider the alternative to Metro's 5 recommendations from the Draft EIR.

Please oppose a freeway tunnel, which is going to be extremely costly and which there isn't currently funding for. We all know that the initial low-ball estimate of \$5+ billion will increase, just as it is in Seattle with Bertha tunnel. That money can be used for light rail, which would cost half as much, which is Los Angeles' wave of the future, not another freeway connector, an outdated concept from last century, and certainly not a dangerous 4.5 mile tunnel. Measure A was put to the voters for a surface freeway. Had Measure A mentioned what years later is now being proposed (an underground tunnel with likely toll for individual drivers to pay), perhaps the vote would have gone another way. It would be a sham for legislators to approve this based on that vote.

I am not a resident of Pasadena, but I am a resident of Alhambra and work in Pasadena. I am not alone in opposing the freeway tunnel, although my city council members would like you to believe that. I am a member of Responsible Alhambrans Against the 710: <http://alhambransagainst710.com>. The tunnel going through Alhambra, South Pasadena and Pasadena would be built for harbor freight traffic, not for local Alhambrans. I live in Alhambra, work in Pasadena and would not benefit at all because of the prohibitive toll, because of the lack of exits and because I take city streets to work at the college in Pasadena anyway. Also, I would not be caught dead in that dangerous tunnel, and will expect a bottle neck of traffic up at the 201/134 connector. What would benefit me would be a light rail so I could commute from Alhambra to Pasadena.

What's more, the pollution from the stacks in El Sereno and Alhambra would be horrifically detrimental. At Metro's informational meeting on March 12, 2015, the CalTrans/Metro consultant explained that there would be **no significant improvement to air pollution** if a tunnel is built, but actually, the tunnel would increase VMT and CO2 emissions, which is demonstrated in the D-EIR's Table 4-8.

I will also suffer for more through traffic in my area. In Table 4-9 in the D-EIR confirms that only 7-13% of all motorists in the study area will save a whopping 2.5 minutes should the tunnel be built, in other words 87-95% of all traffic in the San Gabriel area will not benefit at all! Street traffic will get worse in Alhambra with drivers avoiding the toll. <http://alhambransagainst710.com/what-will-really-happen-to-traffic-in-alhambra-if-they-build-the-tunnel/>

For the above reasons, I am asking you to support the working group's alternative and oppose a 710 freeway tunnel. For the good of the San Gabriel Valley, please vote YES to Opposing the 710 Tunnel, and please consider better options than what Metro/Caltrans has proposed.

Thank you.

M. Michelson
Alhambra

From: cityclerk
Subject: FW: No on 710 tunnel

-----Original Message-----

From: Janet Rose [mailto:jansrose@aol.com]

Sent: Monday, April 06, 2015 6:16 PM

To: Madison, Steve; ttornek@cityofpasadenaa.net, bbogaard@cityofpasadena.net; Bogaard, Bill

Subject: No on 710 tunnel

Our household couldn't feel more strongly about anything than opposing the tunnel. Our reasons are as follows:

Unsafe, for reasons of earthquake, air quality, added traffic (both auto & truck), no exits in case of fire, accident, etc.

Ghastly emission towers on Colorado Blvd.

Measure R never mentioned a lengthy tunnel option, so that point is moot West Pasadena, the Huntington Hospital, Sequoia School, etc. will be adversely affected Consider the problems with the Seattle tunnel, the horrible problems with the fire in the Mont Blanc tunnel in France, etc.

Traffic in Alhambra, etc is not nearly so bad as on our California Blvd, Lake St., etc. To try and say that traffic remediation there warrants this absurd tunnel idea, with its enormous cost, is simply absurd.

NO ON ANY 710 EXTENSION, especially a TUNNEL!!!!!!!!!!

Janet Rose & Eric Bosc

Sent from my iPad



SAN RAFAEL
NEIGHBORHOODS ASSOCIATION

Mayor Bill Bogaard
City Council
City of Pasadena
100 N. Garfield Ave.
Pasadena, CA. 91101

Jan 9, 2014

Dear Mayor Bogaard & City Council,

The San Rafael Neighborhoods Association, (SRNA) Board of Directors and our membership are concerned about the impacts of the proposed 710 freeway extension on Pasadena's residential neighborhoods. We understand that until the EIR is released sometime in March or April of 2014 we do not know for certainty which of the five alternatives will be chosen, yet it seems very clear that the tunnel option is the preferred solution by Los Angeles County Metro.

We are counting on the City of Pasadena to ensure that the potential impacts to Pasadena are analyzed thoroughly, that the public has adequate input in the EIR analysis process and that the results of this analysis are shared with Metro and the public.

Our concerns are for impacts city wide. Impacts such as; increased air pollution, increased traffic congestion, lengthy construction near Old Pasadena businesses, and impacts to the quality of life at nearby schools. We feel strongly that the City needs to develop a plan by which the public comments and the City's response to the draft EIR will be fully accomplished.

We are aware that Pasadena and surrounding cities are planning on reviewing the EIR jointly but this will be a regional analysis. If the tunnel option is selected, the impacts to the entire city are potentially severe. We recommend that the City conduct an independent study of the draft EIR to carefully determine local impact. We also urge the City to establish an open process through which Pasadena residents can comment on the draft EIR and on the City's response. We recommend city commissions or a special task force and civic organizations to be involved.

If your office and the City Council are going to serve its residents in this EIR process and spare the City from long term horrendous impacts the tunnel option will have to our environment, health, and prosperity, then these are areas that need to be addressed in the very near future. A detailed plan for assessing the draft EIR that includes but not limited to;

- A process for incorporating public comments in the City response to the draft EIR
- Suggested mitigation measures for significant local impacts.
- How the City will manage unmitigated impacts if any.
- Input from city retail businesses, museums, restaurants and events locations
- The potential health risks associated with the tunnel project

SRNA took the lead to oppose the 710 expansion and we look forward to you and the City Council taking an equally aggressive lead in planning its address to the draft EIR. It will be a terrible outcome for Pasadena if the tunnel option is selected and we don't begin to plan our response today.

Sincerely,

Stan Clark for;

Ron Paler, MD.
President

San Rafael Neighborhoods Association, (SRNA)

P.O. Box 92617
Pasadena, CA. 91109
www.srnapasadena.org

Jomsky, Mark

Subject: RE: PLEASE OPPOSE THE 710 TUNNEL!

From: S Tanner <s.f.tanner47@gmail.com>

Date: April 5, 2015 at 12:29:13 AM GMT+2

To: <bbogaard@cityofpasadena.net>

Subject: PLEASE OPPOSE THE 710 TUNNEL!

Dear Mayor Bogaard,

As a West Pasadena resident, I strongly oppose the proposed 710 tunnel and support the Working Group's proposal for alternative action.

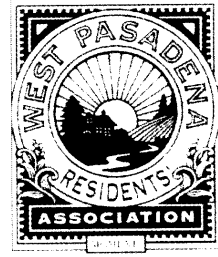
Thank you in advance for your support,

Susie Tanner
1795 La Loma Rd
Pasadena, 91105

--

Susie Tanner
Producing/Artistic Director, TheatreWorkers Project
Director, SHAKESPEARE REMIXED
www.theatreworkersproject.info
twproject83@gmail.com

Teaching Artist
Los Angeles County High School for the Arts
www.lachsa.net
Sequoyah School
www.sequovahschool.org



April 4, 2015

The Honorable Mayor and Councilmembers
City of Pasadena
100 N. Garfield Ave.
Pasadena, CA 91109

Re: City of Pasadena's Position on SR-710 North Alternatives

Dear Mayor Bogaard and Councilmembers:

The West Pasadena Residents' Association (WPRA) urges you to continue fighting the disastrous SR-710 freeway tunnel alternative proposed by Metro and Caltrans. Specifically, we ask you to:

1. Vote against the SR-710 tunnel alternative

- The Draft EIR/EIS demonstrates that this alternative does not improve regional traffic. It simply shifts traffic from one part of the region to another.
- This alternative is not cost effective. Instead of spending billions on an alternative that has minimal benefit, we should invest precious taxpayer funds on environmentally responsible public transportation options.
- This alternative will have very large negative and permanent impacts on Pasadena's traffic, air quality, economy and quality of life.

2. Endorse the Pasadena Preferred Alternative recommended by the City's SR-710 Alternatives Working Group.

We agree that a multi-modal alternative including light rail transit, expanded bus service, local street network improvements and bicycle transit, is the preferred alternative.

3. Endorse the Connecting Pasadena Project.

The CPP is a citizen-driven effort to develop a vision for revitalizing the SR-710 stub, a barren 35-acre area seized by the State for extension of the SR-710 freeway.

4. Demand that Metro and Caltrans provide a cost benefit analysis for the proposed SR-710 Project for public review.

- Caltrans has publicly promised to provide such an analysis, including during the California Transportation Commission meeting on December 11, 2013.
- Cost estimates used in the DEIR released March 6 are general and very puzzling. The SR-710 tunnel estimate is half the cost per mile of its proposed Sepulveda Pass tunnel.

WEST PASADENA RESIDENTS' ASSOCIATION
POST OFFICE BOX 50252 • PASADENA, CA 91115

There are no contingency provisions, even though failures and cost overruns on such projects are the norm.

5. Demand that Metro and Caltrans study the environmental impacts of a tunnel-boring machine (TBM) failure.

- Failures of drilling equipment and tunnel flooding and collapses have plagued *almost half* of the world's large tunnel projects reviewed.
- The spectacular failure of the Seattle tunnel's TBM is a recent and real-world example of how TBMs can and do fail. Such a failure would have severe environmental consequences and significantly increase project costs.

6. Agree that Pasadena's Measure A should not constrain councilmembers' ability to speak and vote on this critical issue.

Specific proposals for connecting SR-710 are before us. At the time of the Measure A vote, the SR-710 project didn't include tunnels, tolls and trucks. Furthermore, in 1999, one year before the measure was placed on the ballot, the United States District Court for the Central District of California ruled that both the EIR and EIS upon which Measure A was based, were inadequate and issued an injunction against the 710 freeway project (*City of South Pasadena et. al. v. Slater (U.S.D.C. Central CA 1999) 56 F.Supp.2d 1106*).

Sincerely,

Geoff

Geoffrey Baum
WPRA President

Bill

Bill Urban
WPRA Board Member/ Past President

Audrey

Audrey O'Kelley
WPRA Board Member/Past President

Michael

Michael Udell
WPRA Board Member/Past President

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