

Issue	RTD's Plans	Specific Concerns/Questions	Potential Solutions suggested by the community	Costs	Other issues to be considered	Experts	What needs to happen to make this change	Final Resolution
Noise Walls								
	Noise walls along the trackway are the most effective noise mitigation	Alternatives to Noise walls should be considered	wheel skirts		Other alternatives may not mitigate the noise to the extent required by FTA	Lloyd Mack	Wheel skirts are already on RTD vehicles.	Wheel skirts are already on RTD vehicles.
			undercar absorption		RTD already sprays the under car with a sound deadener / insulation	Lloyd Mack	RTD already sprays the undercar with a sound deadener/insulation	RTD already sprays the undercar with a sound deadener/insulation
	Designers have reduced grade difference between track/platform and road to greatest extent, with Garrison intersection controlling, by increasing slope along station to 1.5% (approval by RTD to exceed normal max of 1.0%)	The specific question is regarding Garrison since the tracks sit so far above grade.	shallow trenching	Technical feasibility	Shallow trenching puts the track slightly below existing grade. This is very expensive due to additional utility relocations, and not possible on this corridor due to the numerous at-grade crossings.	Design Team	Moving the track at this point would cause too many changes and is not possible. The design team has already lowered the track at Garrison to the greatest extent possible.	The track cannot be lowered any further.
		Would like to see bells from train not ring at station Would like to see train slow down sooner so bells wouldn't ring at stations.	operational policy in quiet zones	PUC approval	RTD's SOP for the West Corridor will be <u>no horn blowing or bell ringing at grade crossings</u> unless deemed necessary by the operator. PUC to make final determination. At stations, bells will only ring when people are present	Lloyd Mack	The PUC has final determination for no bells at grade crossings and bells at stations. RTD will include these requests/recommendations in their application to the PUC in January.	RTD will include these requests/recommendations in their application to the PUC in January.
	6' pre-cast concrete noise walls with sound absorptive materials on inside wall are planned	Concern about Noise Wall materials	Would like noise dampening attributes on both sides of walls (LRT and street side) - reflectivity, direct and secondary (into non-adjacent properties) - the concern is that noise from automobiles driving on 13th will be reflected off the outside of the noise walls and back into the neighborhood to the south.	Cost Maintenance Aesthetic Concerns Effectiveness	FTA requires noise absorption material on inside only - the absorptive materials limit aesthetic treatments Reflective noise from autos is not one of the areas that is required to be examined by FTA when doing noise analysis, and was not included in the RTD analysis. However, we asked our noise analyst to examine this and based on the traffic volume and speeds on 13th Avenue the increased decible levels from reflective noise are between 1-3 dba - imperceptible and not effective to mitigate.	Construction/Noise	Adding noise absorptive material to the outside of the walls is ineffective and expensive. additional cost, design of walls on outside is extremely limited with sound absorptive materials, noise material makes graffiti removal more difficult, makes walls thicker. This is not a justifiable expense to the project. If this is requested, funds from other sources would need to cover the costs	RTD does not plan to add noise absorptive materials to the outside of the walls, because we don't believe the benefits outweigh the costs. If this is requested, funds from other sources would need to be located.
	Noise wall designs incorporate the station themes and other textures - RTD is planning on adding vines on the Kipling approach walls since 13th Avenue is not adjacent to the walls in that location.	Concern about aesthetic qualities	Use of vines for noise and sound reduction and better aesthetics	cost	Tight right-of-way constraints, no room for irrigation, salt from the adjacent roadway kills vegetation -	Maintenance/Lakewood Public Works	Additional right-of-way would need to be purchased so that 13th Avenue could be moved to the south to allow space for vines to grow on noise walls along 13th Avenue. There is no money in the RTD budget for additional right-of-way.	RTD does not plan to purchase additional right-of-way for this purpose, but will look at the option of adding vines on the Kipling approach walls.
	RTD has given consideration to both graffiti coating and the use of paint to cover over graffiti. Based on experience on T-REX, it has been determined that graffiti coating is more expensive and less effective than repainting over graffiti.	Concern about graffiti-resistance qualities			Covering graffiti with paint will be taken care of by RTD maintenance - it is RTD's policy to remove graffiti within 24 hours.	Maintenance/MOW	RTD has given consideration to both graffiti coating and the use of paint to cover over graffiti. Based on experience on T-REX, it has been determined that graffiti coating is more expensive and less effective than repainting over graffiti. The entire panel is re-painted - seam to seam - when covering graffiti.	RTD will use existing graffiti removal techniques

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Noise Wall Policy								
		What happens if a property owner opts out, and later RTD changes the default design			RTD is not planning on changing the design, but if property owners opt-out and the design changes, they will be notified and given an opportunity to change their mind.		RTD is not planning on changing the design, but if property owners opt-out and the design changes, they will be notified and given an opportunity to change their mind.	All environmental evaluations, including noise, must be completed for the 2030 planning horizon. All operating assumptions show future operations through 2030 to remain the same as opening in the residential section of the West Corridor. Therefore it is not reasonably anticipated that any service changes will take place through 2030 in this area. If and when operational changes occur, there is a public involvement process
	Noise walls cost \$30/SQUARE foot (or \$180 LF) and compensation to opt-out = \$30/LINEAL foot	Inequality between cost to build default noise walls and the amount of compensation paid to property owner who opts out and has to construct individual noise-abatement measure plus bear the cost of maintenance			Opting out for privacy fences (or cash) was a Value Engineering item - The \$30/lf is equal to the cost of constructing a 6' wooden privacy fence on property lines.		RTD and/or City of Lakewood would need to agree to increase the amount of compensation they would pay to property owners who opt out of noise walls. Price of barriers (as noise wall replacements) is a factor here.	Lakewood is working out alternatives to noise walls to present as a menu to the affected property owners. RTD is working with Lakewood on pricing options.
	RTD does not plan on blowing horns or other sounds at grade crossings unless the train operator determines there is a safety concern. This new West Corridor SOP will need to be approved by the PUC as part of the West Corridor application in January.	Quiet alternatives to bells and warning devices on LRT should be considered	reduce sound of warning devices on train (Grade Crossings)			Genova/Mack	RTD does not plan on blowing horns or using bells on the train at grade crossings unless the train operator determines there is a safety concern. This new West Corridor SOP will need to be approved by the PUC as part of the West Corridor application in January.	RTD will include these requests/recommendations in their application to the PUC in January.
	There is no PA system planned for the platforms		lower volume of announcements at stations on the <u>Platform</u>				There is no PA system planned for the platforms for opening day, but when one is installed there are ambient noise sensors that set the volume of the announcements based on ambient noise.	
	The volume of the announcements on the trains is not variable.		lower volume of announcements at stations on the <u>Train</u>		The noise level of the announcements on the train is not variable- There is also an ADA requirement that RTD must meet for the visually impaired.	Genova/Mack	The noise level of the announcements on the train is not variable- There is also an ADA requirement that RTD must meet for the visually impaired.	The sound level of announcements cannot be adjusted.
	At stations, there is an ADA requirement for a certain level of warning. At grade crossings, RTD does <u>not</u> plan on blowing horns or other sounds at grade crossings unless the train operator determines there is a safety concern. This new West Corridor SOP will need to be approved by the PUC as part of the West Corridor application in January.		flashing lights rather than bells to warn of approaching train AT STATIONS AT GRADE CROSSINGS		Bells must ring at stations to warn people of approaching train - ADA issue. If no one is present, the bells won't ring.	Dave Genova/Lloyd Mack	Bells must ring at stations to warn people of approaching train - ADA issue. If no one is present, the bells won't ring. At grade crossings, RTD does not plan on blowing horns or other sounds at grade crossings unless the train operator determines there is a safety concern. This will need to be approved by the PUC as part of the West Corridor application in January.	RTD will include these requests/recommendations in their application to the PUC in January.

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		Would like to see 'white noise' sounds of nature etc come through speakers to help cover the sound of the train.	white noise, environmental art	cost	This solution could be a commissioned art project. Sound artists could devise ways to cover up sound through the white noise that is requested.	Design Team/Brenda	Additional funds for this would need to come from sources other than RTD, or if contingency funds are available through the progress of the project, this could be a commissioned art project	RTD could help fund this through the commissioned art program as contingency funds become available.

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Fencing and Barriers								
	No chain link or wire mesh fencing is planned between Harlan and Oak along the barriers. Post and Cable fencing is being recommended as the barrier along the alignment between stations. At stations there is a framed grid fence planned, and a decorative framed fence planned for the highblocks at the stations.	Concern about chain link and/or wire mesh fences	Reconsider chain-and-bollard and post-and-cable styles of fencing	cost, safety	Chain and bollard is expensive and there are some safety concerns, however post and cable fencing is being recommended through the West Corridor residential section	Design Team/Dave Genova	No chain link or wire mesh fencing is planned between Harlan and Oak along the barriers. Post and Cable fencing is being recommended as the barrier along the alignment between stations. At stations there is a framed grid fence planned, and a decorative framed fence planned for the highblocks at the stations.	Post and Cable fencing will act as the barrier fencing along the trackway between Harlan and Oak, in locations that there are not sound walls or a station. Station fencing will be more decorative.
At-Grade Vehicular Crossings								
	Minimum walkway width would be five (5) feet. The location of the walkways was reviewed with the PUC.	Concern about pedestrian safety when crossing the light rail	Improve the pedestrian crossings along side the north-south streets that cross LRT at grade - How wide are the pedestrian walkways across the tracks. Is there room for a pedestrian to walk along if two automobiles are also crossing at the same time			Dave Genova/ Design	Walkway widths are a minimum of 5'	
			Include sidewalks on both sides of the street crossings to allow for safe pedestrian/bike passage at the same time two automobiles are crossing the tracks.			Dave Genova/Design Team	In most locations, paths across the tracks are on both sides of the street.	
	There is a 20 second clear time from when the gates start down before the train crosses the intersection. This is enough time for the pedestrian to make a decision on whether or not to cross.		Include safe landing areas between the adjacent street and the LRT/quad gates for pedestrians/bikes to pause while LRT and parallel automobile traffic are passing. Safe landing spots north of each north gate support post and south of each south gate support post.	cost	There is no room for a larger landing area than what is in the plans without purchasing additional right-of-way. These individual intersections were reviewed with PUC to ensure compliance.	Dave Genova, Design Team	There is a 20 second clear time from when the gates start down before the train crosses the intersection. This is enough time for the pedestrian to make a decision on whether or not to cross. PUC and RTD safety have examined this design and have found it to be effective. If however, someone gets caught between the east/west street and the lowered gates, there is an area (anywhere from 2-5' wide) where someone could stand.	
Bike Path		Concern over how often bike/peds cross track	To the extent possible, eliminate path crossing back and forth over rail line; unsafe for bikes; not great for pedestrians either.		Bicycle and light rail interface has been minimized along the corridor to the greatest extent possible given the constraints of right-of-way, budget and the governing design standards. Where this interface is unavoidable, the interface has been designed by following the applicable design standards for bicycle facilities.	Chris/Beth/Lakewood	Bicycle and light rail interface has been minimized along the corridor to the greatest extent possible given the constraints of right-of-way, budget and the governing design standards. Where this interface is unavoidable, the interface has been designed by following the applicable design standards for bicycle facilities.	
	Flangeway fillers are included in current design.	Concern over ease of crossing track	Wherever bike/pedestrian path crosses LRT use bike-friendly rubber panels between the track and the pavement		Cost of flangeway fillers	Chris/Beth/Lakewood	Flangeway fillers are in the plan	

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	Curb cuts are based on turning radii of emergency vehicles.	Concern over safety of bikes and peds	Make wide curb cuts at corners where path meets street.		Cost	Design team,	Curb cuts are based on turning radii of emergency vehicles.	
	The City is responsible for snow removal on the bike path, RTD is responsible for snow removal at stations and park-n-Ride's	Concern over who is responsible for snow removal on the bike path	Determine which entity has responsibility for snow removal, and include the requirement in the Inter Agency Agreement.			FM/Lakewood PW	Lakewood is responsible for snow removal on the bike path, RTD is responsible for snow removal at the stations and park-n-Ride's.	
Pedestrian Crossings		Have more crossings for ease of pedestrian movement and to prevent illegal crossings			Additional ped crossings have been looked at for Allison and Nelson. See details below.			
	There is no crossing (vehicular or pedestrian) planned at Allison		Have a crossing at Allison. Make this an at-grade crossing for vehicles as well, if pedestrian-only crossing is not possible	Additional Quad Gates - Staff costs of design change	Each at-grade vehicular crossing adds cost (gates-design) and travel time. The set of street closures was set in the EIS and has not changed since. A pedestrian crossing at this location is only possible with additional right-of-way purchases to the south to move the road around the crossing.	Lloyd Mack/Design Team City of Lakewood	Additional vehicular crossings in the project are not reasonable at this time. This was approved as a street closure in the EIS and has remained so. Opening this would adjust travel time and ridership as well as project schedule. A pedestrian crossing would require additional right-of-way be purchased so that 13th Avenue could be moved to the south to allow space for the pedestrian Z-crossing. The City of Lakewood will be working on a future ped crossing at this location as development occurs	RTD is not planning a pedestrian crossing at Allison Street but will work to design the intersection so that a ped crossing can be added in the future as development occurs.
	RTD is willing to consider a ped crossing at Nelson, but the adjacent community is very opposed.		Have a crossing at Nelson to accommodate people without cars who live between Lakewood Gulch and the tracks and need easy pedestrian access to Colfax	RTD has agreed to bear the cost of this ped crossing if it is included	Many of the neighbors who live near this crossing are opposed to it. The Eiberhood Association and the TLCC have expressed the need for a pedestrian crossing in this area and their support for it.	Community issue	The City of Lakewood and RTD agree that this decision needs to be made based on input from the neighbors in the adjacent area.	RTD will do some additional surveys of adjacent residents and make a decision
Power substations aesthetics								
	RTD has agreed to use Omega fencing around the substations at Lamar, Wadsworth, Independence and Oak	Concern over aesthetics of substations	Use NO chain link, nor wire mesh, nor barbed wire for fences.		Fencing must meet requirements of 8' tall and unclimbable	Systems/Operations/MOW	RTD has agreed to use Omega fencing around the substations at Lamar, Wadsworth, Independence and Oak	RTD will use Omega fencing around the substations at Lamar, Wadsworth, Independence and Oak
			Use landscaping in space between structure and fence.		We can not landscape between the substation and the fence. We need this area clear for maintenance access. We put crushed rock inside of the fenced area to limit the touch and step potential. This is for safety.	Systems/Operations/MOW	We can not landscape between the substation and the fence. We need this area clear for maintenance access. We put crushed rock inside of the fenced area to limit the touch and step potential. This is for safety.	No landscaping can be planted between the substation and the fence.

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			Camouflage the building to resemble structures in neighborhood.		Camouflaging the building with brick etc is very costly. It must be done at the substation manufacturer and tested thoroughly.	Lakewood	Identify which locations. Determine funding for improvements. Criteria for access and ventilation must be maintained. The manufacturer of the substations offers a variety of available paint colors at no additional cost.	These improvements can be made if a funding source is located. RTD does not have this item in the budget

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Security at stations								
	Elevator towers are required to have glass on three sides for safety. There is only the station at Garrison that noise walls are planned. The station areas will all be well lit and monitored.	Concerned that noise walls at stations create a safety problem.	Don't have any impairments to visibility. Everyone in station must be easily visible from within and from outside station, including those in stairways.		Stairways and elevators towers have safety requirements for visibility. Garrison station with noise walls on both sides is well lit and will be monitored by video equipment.	Dave Genova	Garrison Station is the only station with noise walls. The barriers are reduced from 6' for line of sight for autos crossing at Garrison. There are similar situations on the Southeast light rail at Colorado and Louisiana. Adjacent property owners would need to opt out of noise walls at this location	Lakewood Police and RTD security people will review this situation and make a safety determination.
	Security cameras for each station are in the plans.		Place security cameras to clearly view entire station.			Dave Genova	Security cameras for each station are in the plans.	
	Emergency phones are planned for each station		Have call boxes readily available.			Dave Genova	Emergency phones are planned for each station	
Station Design								
Lighting	The 65% plans show lighting that is both suspended in some stations and on poles in others. The fixtures are the same and the light is very focused and doesn't trespass outside the station area. The community was generally supportive of this option at the UDC meetings. Based on recent comments from Lakewood, lighting options are still being discussed.	The City has asked that the lighting be changed to something like we have on existing light rail lines or what they are planning for enhanced Wadsworth station	Don't use suspended lighting.	space constraints, specifically at Garrison and Lamar	The number one priority for lighting from the community during the EIS and design was that there was no trespass of light into adjoining properties. The recommended lighting type is also used at the new Belmar development. The lighting fixtures will be on poles in some places and suspended in other places where space is very constrained.	Peter	Lighting options are still being discussed with Lakewood.	RTD will eliminate suspended lighting in Lakewood, and put the lights on poles.
Windscreens	Windscreen designs are set for both N/S and E/W winds	Design screening to be effective against prevailing wind directions.			Windscreens are set with panels both N/S and E/W, to the greatest extent possible	Peter	Windscreen designs are set for both N/S and E/W winds	
Platforms	The current plan is to follow the standard RTD Facilities Maintenance snow removal policy is as follows – We do not allow dirt/clay type ice melting material because it makes a large mess. We typically use magnesium chloride crystals in a broadcast type spreader. We shovel by hand, with snow throwers, and snow brooms. Occasionally we will use a small truck with a plow. Snow removal needs to be completed by 5:00 a.m., or 2:00 p.m. depending when the storm arrives. ¼" to 1" use ice melting material - Over 1" shovel then apply ice melting material	Concern about snow removal on platforms	Design stations for ongoing snow removal; consider heated platforms.	cost of heated platforms, revised design, future maintenance	Radiant heat is too expensive and difficult to maintain, however the standard RTD Facilities Maintenance snow removal policy is very effective on all existing RTD properties	FM	Radiant heat is too expensive and difficult to maintain, however the standard RTD Facilities Maintenance snow removal policy is very effective on all existing RTD properties	Radiant heat will not be installed, but RTD's snow removal procedures will be in place for station platforms and park-n-Rides

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Artwork	Integrated artwork has been incorporated into the design through bridge design, windscreens, benches, wall themes etc. Commissioned artwork selection procedures for RTD include a standing committee for the entire corridor (consisting of artists and art professionals) in addition, 3 community members will be asked to join the committee as voting members for each station.	Concern about artwork selection	Have artwork selection made collaboratively with neighborhood.		As contingency money becomes available, the commissioned art program will be instituted and will follow RTD art selection procedures which include community members on the selection committee.	Brenda	Integrated artwork has been incorporated into the design through bridge design, windscreens, benches, wall themes etc. As contingency funds become available, the commissioned art program will be instituted.	
Ramps/Walls								
	RTD plans to use textured designs on the MSE wall which will defract the noise from the adjacent street to some degree. However, noise absorption material is not planned for the MSE walls.	What are the noise reflection properties of alternative designs?				Noise - Rich Letty	Noise absorptive material is not planned for the MSE walls for the same reasons as the street side of the noise walls	RTD plans to use textured designs on the MSE wall which will defract the noise from the adjacent street to some degree. However, noise absorption material is not planned for the MSE walls.
		Aesthetics	Use of vines or other landscaping materials?		Vines work at Kipling but there's not enough room at Wadsworth	MOW/ design	RTD has been working with Lakewood on final MSE wall designs.	RTD is not planning on using vines on Wadsworth approach, but is working with Lakewood to incorporate elements of the Klipp design into the wall design.