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Marla L. Lien  
General Counsel  
Denver RTD  
1600 Blake Street  
Denver, Colorado 80202-1399

Dear Marla:

This is in response to your request for a review of issues surrounding the possibility of electrification of BNSF's Denver-Longmont line and Golden line for commuter service and acquisition of a portion of the right-of-way corridor along BNSF's Golden line for commuter service. With respect to the Denver-Longmont line, we understand you are considering the possibility of electrification in a joint use corridor setting as opposed to conventional diesel equipment on the line jointly used for freight operations.

#### Denver –Longmont Corridor

In general, our initial review of issues in this area indicates we are not prepared to say that such joint commuter and freight use with electrified equipment is infeasible or prohibited, but it would appear to present a number of major operational and construction issues, significantly increased capital costs, significantly increased future maintenance costs, and may raise certain regulatory approval issues. It would be critical that such operation permit safe, efficient, and fluid operation for both freight and commuter services and a physical plant that enables track maintenance to be accomplished without significantly impeding either service. In addition, electrification would seriously constrain future capacity expansion capability in the existing corridor.

Factors that would affect such a decision include the following:

- Any catenary would be required to meet 26 foot above top of rail clearance requirements.
- Overhead bridges would have to be fenced in such a way that people will not be able to drop things like shopping carts onto the catenary. We are not aware if there may be other Colorado PUC or other regulatory requirements or whether such a program might lead to new requirements being promulgated to protect public safety.

- Grade crossing gates would have to be located to ensure that they would never foul the catenary.
- Access to local industries for freight service would need to be provided clear of catenary poles and wires.
- Insulation against stray electrical charges would need to be provided, including whatever would be necessary to ensure that electrical current does not enter into the ground. When this happens, we understand underground metals, like drainage pipes, can ultimately fail.
- The signal system that would be installed as part of an improvement project would also have to be insulated, at some incremental cost increase over the base cost of such a new system.
- Railroad lock-out, tag-out practices will have to be modified to include the need to shut off the power to the catenary.
- Electrification of the rail line to Longmont would raise a number of issues with respect to track maintenance. Electrification would require not only that we change our track maintenance practices, but certain existing track maintenance equipment is not compatible with working under catenary. Our undercutting equipment uses conveyors to lift spoils into waiting cars. The height of the conveyor would be too close to wire, thus requiring the purchase and use of different types of equipment, such as are currently utilized in Europe. The off-loading of ties would have to be accomplished via side loaders, instead of from gondolas and cranes. BNSF does not have such equipment in the current fleet today, and it would be necessary for such equipment to be acquired and dedicated to the line. In addition, any of BNSF's current boom trucks that handle day-to-day maintenance (e.g., the lifting of a frog from track side to a switch location) would come too close to the wire to avoid arcing. Daily track maintenance boom trucks and other trucks designed to lift materials would have to be replaced and suitable new equipment acquired and dedicated to the line. Thus, future maintenance of the track structure would require wholly unique track maintenance equipment and the development and implementation of practices that would not foul or even come close to the catenary. This area would likely cause a significant increase in cost of both capital equipment and future maintenance attributable to the electrified commuter service project. It is unclear whether and to the extent new work practices involving changes to collective bargaining agreements or other work rules and procedures would need to be developed and implemented for such a corridor or segment.
- Undercutting standards would have to be modified, with more undercutting required than is normal, because it would be necessary to maintain the 26 foot clearance between the top of rail and the catenary.

- It is possible that it would be necessary to petition the Colorado PUC or other regulatory bodies for approval of a joint diesel/electric operating corridor. We understand this is currently being done by the Peninsula Corridor Joint Powers Board (Caltrains service from San Jose to San Francisco). Items such as protection against electric shock, grounding and bonding, strength requirements, and safe work practices would have to be addressed.
- We do not know and have not investigated whether specific approval of the Federal Railroad Administration would be required to permit joint diesel/electric freight use with whatever specific electrified commuter equipment RTD may consider.
- We are not in a position at this time to estimate the overall increased costs of electrification of such a corridor if it were to prove to be feasible, but in terms of order of magnitude it seems likely that initial capital costs would be tens of millions of dollars higher, and annual operating and maintenance cost millions of dollars higher than for a conventional joint use corridor.

Another significant long term factor to be considered is the impact of electrification on the ability to add future capacity expansion on the Denver – Longmont corridor. In general, the current BNSF corridor appears likely to have the physical capacity for expansion to a potential third track at some point in the future with conventional locomotive power. Such expansion, however, would be precluded in key segments of the corridor if electrified within the current physical limitations.

The current proposed track design under consideration for electrification would call for 68 feet of right of way to accommodate three tracks with 25 foot track centers, plus 18 feet for two roads on the outside of tracks 1 and 3. Drainage would be accomplished between tracks 1 and 2 and tracks 2 and 3. Catenary poles would be accommodated as RTD has proposed. In general, our present right of way appears capable of accommodating the construction of a three track, non-electrified mainline, or a two track plus two catenary pole construction design, with service roads. A three track electrified line, however, faces much more serious constraints. Either expansion design would have to overcome three types of constraints, which are much more manageable with conventional technology. Factors affecting expansion capability under alternative scenarios include the following:

- When the right of way is on a slope or fill, either a great deal of sub-grade and retaining wall construction work would have to be completed or it would be necessary to narrow down the track centers.
- When the present right of way corridor is in a city and the right of way is narrowed, as in Boulder and similar locations, it would be necessary either to purchase property outside the present railroad's operating envelope or it would be necessary to narrow down the track centers.

- When there is the need to access a rail-served industry, it will be necessary to acquire additional property outside the operating envelope of the railroad to accommodate the industry lead track of hundreds to thousands of feet (i.e., length will vary since we will require that all industry switching be done off the mainline due to the frequency of passenger trains) or it would be necessary to narrow down the track centers.

The key difference in addressing any of these constraints upon future expansion is that in a non-electrified territory, it is possible to narrow down the track centers, which would not be workable for such a structure with electrified commuter service. During track maintenance, track centers of less than 25 feet require that two tracks be taken out of service (i.e., the track being worked on and the adjacent track). In short segments, this problem can be overcome through taking advantage of the natural lack of train meets and passes in the area or by modifying schedules. However, the RTD's catenary poles, the need for service roads to access the wire, and the anticipated demand for a high level and frequency of service in the corridor, would severely limit the ability to reduce track centers. Thus, to build a three track, electrified mainline, it would be necessary to acquire additional property and build additional infrastructure to maintain 25 foot track centers. The impacts of this additional property purchase would be significant, especially in built up areas or in the park lands or preserves along a portion of our line.

Overall, our review indicates that if the corridor were electrified, such expansion to a third track would no longer appear to be feasible within the current physical limitations of the existing corridor. The acquisition of additional right-of-way would bring the associated costs of land acquisition, environmental effects, permitting and construction and grading issues, if such expansion is even possible. Thus, the use of electrified technology would appear to place serious long-term capacity constraints on the use of the corridor for both commuter and freight service in the future.

### Denver Golden Line

On the Denver Golden line corridor, assuming the use of a separate right-of-way corridor for commuter purposes carved out of BNSF's existing freight corridor, while we cannot say at this point without further engineering that an electrified operation is fully implementable, the issues should be much more manageable. Adequate service roads, clearances and drainage would, of course, be necessary. Construction costs could be higher than with conventional operation to accommodate the catenary, clearances for access, and signal system modifications to avoid interference and other issues, but we are assuming that such an operation would be potentially workable and much more manageable.


In general, it appears that there is sufficient width to provide RTD a property interest in the corridor for commuter rail purposes carved out of the existing corridor and adjacent to our existing freight track for use with electrified or non electrified compliant equipment. There may be a handful of areas where the corridor may not be wide enough to fully accommodate a given design, particularly if electrified, and in these areas RTD might need to acquire additional right of way in order to provide adequate

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service roads and clearances as well as the tracks, but this does not appear insurmountable.

All of this, of course, assumes that the parties also would be able to negotiate and enter into acceptable agreements governing how the parties would jointly use track and infrastructure in the Denver – Longmont Corridor and share the Golden corridor, acquisition terms, liability protection and other items we have discussed. It also assumes any RTD operation would utilize FRA compliant commuter equipment. We look forward to our further discussions and negotiations toward that end.

Very truly yours,



Richard E. Weicher