

A conversation with Capital Programs about rail reconstruction: 'This project is necessary'

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Teams throughout RTD are preparing for full-depth work to reconstruct miles of light rail track in downtown Denver, an approximately \$152 million project that will begin in May and focus on five track segments at street intersections in the Downtown Loop. Subsequent phases of the project will occur in 2025. With this work, RTD is investing in its oldest rail infrastructure to ensure the long-term integrity of the network. Bookmark the project webpage to see updates throughout the summer.

Project goals include reconstructing rail to have a target design life of at least 30 years; completing the work safely and efficiently; ensuring quality construction; and minimizing impacts to customers, residents and adjacent businesses. RTD will use the data gathered to inform future reconstruction work and maintenance and provide customers and the public with regular project updates and schedule services information.

Led by Project Manager Jyotsna Vishwakarma, Acting Assistant General Manager, a core team from RTD Capital Programs will oversee this project: Kevin Diviness, Director of Quality Assurance; Paul von Fay, Acting Chief Engineer; Kirk Strand, Engineering Services Manager; and Jeet Desai, Engineering Construction Manager. Before the work kicks into high gear, these four made time to answer questions from employees and customers about this project.

Each of you, please introduce yourself and tell us about the relevant experience you bring to this project.

Kevin Diviness: I'm Kevin Diviness. I'm Director of Quality Assurance for RTD Capital Programs. I've been with the agency for 23 years, and before that I was with DART (Dallas Area Rapid Transit). I worked on the (Transportation Expansion) T-REX Project (a \$1.67 billion light rail and highway expansion with the Colorado Department of Transportation to upgrade transportation in the southeast corridor) and all of

RTD's FasTracks projects. What I bring to the project is a background in project delivery and project management.

Paul von Fay: I'm Paul von Fay. I'm the Acting Chief Engineer at RTD. I've worked for RTD for 18 years. I was the design manager and the engineer of record for the west corridor (the W Line) when it was being built. I was the design manager for the I-225, R line. I bring 10 years of managing major billion-dollar rail projects for RTD.

Kirk Strand: I'm Kirk Strand. I'm the Engineering Services Manager for RTD. I've been with RTD Capital Programs for 22 years. I started as a track engineer and became the track team lead, and then the Engineering Technical Service Manager. Now I'm the Engineering Services Manager. I'm in charge of the track and the structures group. I've been a track designer since college, and then I led the design team and all the Capital Programs track repair projects that we're going to talk about. I'm basically the technical lead for track work.

Jeet Desai: My name is Aprajit, but very few people know me by that name, so I go by Jeet Desai. I have been with the agency since 2006, and I'm blessed to have had opportunities to change my profession, my career, within RTD. I was originally hired as a transportation planner, and then I moved to engineering. My first job was office engineer on the North Metro (N Line) project. Then I got involved heavily with the North Metro stand-up operation and took on the position of N Line stand-up project manager. After successfully doing that, I got a position as a business program manager, which was completely different from anything I have done. It gave me an opportunity to understand how RTD leadership works and how agency wide decisions are made. I took on my most recent position in March of last year, as Manager of Engineering Construction.

On the downtown rail replacement, I am working on a subset of this program, which is the downtown rail intersections improvement project – improving five intersections this summer. I am the project manager for the work, which sets up a precedent for the entire downtown rail replacement. I am responsible for all construction matters. With the tutelage of Kevin, Paul and Kirk, I take design information and get my marching orders and get things done on the ground.

Between 2012 and 2023, RTD completed 17 repair and replacement projects at key intersections within the central corridor. This work prioritized curved rail, switches and at-grade crossings. How is this project different?

Kirk Strand: I have been involved in almost all of the repair and replacement projects that we've done on the central corridor. A lot of these guys were on the project teams, like Paul and Jeet and Kevin were, out doing FasTracks while we were doing some of these smaller projects in-house. My design group designs these, and then we pass them over the fence to the construction group to execute these construction projects.

Maintenance of Way and Capital Programs worked together to prioritize these projects. Capital Programs did not independently initiate them. We responded to requests from Maintenance of Way and Rail Operations. We're partnering with them. Due to the tight time restrictions for shutdowns we've been allowed in the past, these projects are designed in house and contracted out with larger construction firms. Typically, we would come up with lists of things that need to be repaired from a trackway

standpoint, and then we try to find budget and a shutdown window to do them in, and that would set our schedule.

We would have about two shutdowns per year. We tried to do one in the spring and one in the fall. It's very hard to shut down the Downtown Loop because of all the different activities going on. We get a lot of resistance from Denver, a lot of resistance from our own Rail Operations, because our job is to move people, and we understand that completely. We try to compress the timeline as much as we can, have the contractors work long hours and sometimes even overnight to get these smaller projects done as fast as possible. Usually, a 10- to 15-day shutdown is what happens. Most of these projects were full depth.

The difference with this project is not what we are doing, but how much and how long it's going to take, how fast we're going to go. Before, we prioritized high-risk areas like switches and at grade rail crossings. Now, we're going to do the whole thing. There won't be a priority of one section of track over another. We're just going to do everything from basically Seventh Avenue all the way to 30th and Downing, exclusive of what we've already replaced.

Jeet Desai: How is this project different? I think it's the magnanimity of it. As Kirk pointed out, we used to do two intersections, and that even was phased. And then we took a bigger chunk with downtown rail intersections improvement, where instead of doing two in a phased approach, we are doing five altogether.

This is even a bigger chunk, where we are talking about an area from Seventh and Kalamath, Colfax, to 30th•Downing Station. The sheer magnitude of the project, that's the first thing. Secondly, how it is different is there are so many moving parts. We have a different project delivery system that we are working on. So instead of fixed design, bid, build, where you have the design, you go out and you bid it, you construct it, this is more about progressive design we are trying to implement. We're design and construction; all will happen together.

I would not say that we are righting the ship as we are building it, because that kind of carries a negative connotation. I would say we are being innovators, where we are identifying early work packages, items where we can do some things early, some things late, something we can design and something we can construct. That's what I see different from traditionally what we have been doing.

It is necessary to reconstruct the rail infrastructure in downtown Denver? What are the conditions that have led to its current state?

Kirk Strand: Is it necessary? Absolutely. The trackway is the oldest in the system, and the specific track we're talking about now is the paved sections. They're very hard to maintain because they're underneath concrete. You can't go out there and adjust the rocks or adjust the ballast or grind the rails. They have very sharp curves for a train section – they're 90-foot-radius curve, which are about as severe as you can do on the light rail car. And they also are subject to deicing salts, and the roadway traffic in the downtown section is pretty severe. There's a lot of traffic downtown. When we did Spear Boulevard, I think the ADT (average daily traffic) was over 70,000 cars per day. That was the highest in Denver at the time. It's probably a little bit lower now because of the pandemic. This trackway is in a severe environment. Liquid mag chloride is sprayed because dry deicing agents are not used as they are in other parts of town. The liquid is harsher on steel rails.

Jeet Desai: From a construction point of view, I will say that this project is necessary. We have to maintain our assets. The general philosophy of RTD right now is we have built a mammoth with FasTracks. But at the same time, now we have more focus on improving our existing infrastructure. We extend its life in many ways: repair, replacement.

Right now, as a part of improving the life of the existing infrastructure, we have been told that this is the approach we should be taking, which is working on full depth replacement. So that's what we are doing right now.

We've got to recognize that not only is the central corridor one of the oldest corridors, it is being subjected to a lot of factors that Kirk already said. But most importantly is where do we go from here? I think that's the sentiment that we have and the reason why we're doing this project.

The original line was constructed with a 30-year design life. What considerations did people have when the original light rail infrastructure was built? Which have changed, and which remain the same?

Kevin Diviness: The original MAC line – and that stood for Metro Area Connection – before it became the central corridor was meant to be a starter system. It was locally funded. There were no federal dollars. There was no tax increase. Basically on a shoestring budget, they built a trunk line knowing that they would be adding on to it. It was something needed to get to other corridors that were in the planning stages. I think it's worth noting that the very next corridor, which was the southwest corridor, qualified for federal funding, but we could never have had a T-REX and we would never have had FasTracks if they hadn't built that original line. I think the idea on everyone's minds was, let's just get this thing started, and then we can see to our plans of building all these other lines.

Kirk Strand: The corridor was constructed using very typical standard trackway design. One of the parts about track design is nothing really changes. When we replace it, we will be replacing largely with an identical section. Tracks are tracks, for the last 150 years.

Are there considerations or design elements incorporated into the full-depth reconstruction that take into account how downtown may change over the coming 30 years?

Paul von Fay: The system side of the rail has evolved quite a bit in the last 30 years. So some of the things that will be directly impacted by this reconstruction, we will probably update with the newest version of the systems equipment, the train to wayside communications loops, the wiring, to make it more reliable and function better with, say, the adjacent traffic signals.

Jeet Desai: I've got two more points to add. Although the system is designed for 30 years, downtown has substantially changed. We all can recognize that from what it was to what it is now is very, very different. And there are a lot of utilities now. It's one of the many, many factors we take into consideration when it comes to designing and everything.

I wasn't there (at the beginning), so I cannot comment on it. But now I'm here, and from the last 30 years we can see that there are tighter curves, there's liquid mag chloride, there is a stray current, there is heavy traffic impact. We have these lessons in front of us now. And that gives us an opportunity to figure some things out differently than we have done, some small changes here and there that might help.

We also have to realize from a transportation planning perspective, Denver was a smaller area. Now it's a rapidly growing metropolitan infrastructure, and post-COVID, pre-COVID, things have changed. Pre-COVID, we were more about a commuting solution, which is like morning peak, evening peak, and we'll fill something in between.

But now, post-COVID, as we can say, we don't have those shoulders. Downtown may not be the most employment-oriented, where people are coming in the morning and going in the evening. Maybe this becomes more about commute throughout the day, because all our trip purposes have changed. Instead of just a commuting solution, now it can be commuting and recreation and some other things. That might change the operation of it. What it might be again, I don't know. But change is inevitable.

Paul von Fay: The current light rail vehicles that RTD uses are no longer made. There's a study going on right now to do level boarding on light rail vehicles. The alignment along the Welton corridor, for instance, is very constrained. Stations are very constrained, and so some of that stuff will need to be looked at, too: How do we meet current thought on ADA requirements and PROWAG (Public Right-of-Way Accessibility Guidelines), and how do we make those stations work, and how would we perhaps make it work with a future level boarding fleet? Those are some things that we probably need to keep in mind as we move forward.

The current level boarding study is also examining what vehicles are available and what the challenges are with doing that. Downtown, our system is designed to meet the current 6-inch curb and sidewalks. How do you incorporate 14- or 15-inch-high platforms? Those are the things that probably need to be looked at for the next 30 years.

Will this work benefit RTD operations in the short term and the long term? If so, how?

Kevin Diviness: A smoother ride.

Kirk Strand: Honestly, it resets the clock. And it was leadership's goal to give us another 30 years or more. So that allows safe rail operations into the future and eliminates any kind of slow orders or service disruptions due to trackway conditions.

Jeet Desai: Also, while this project is going on, it gives a much-needed pause for Rail Operations to hire more and train operators, which gives them an opportunity to be proactive.

This project will be impactful to customers while it's occurring. How will the public reach downtown Denver during this time?

Jeet Desai: First and foremost, what's important is we need to have a fact-based conversation, not feeling-based, not perception-based conversation. Fact-based conversation entails that the end user of the system is involved early in the decision-making. Their voices are heard. We might think that this solution we are proposing might be helpful, but it might have some unintended consequences that we might not have thought about. If the person on the receiving end is involved in the beginning and says hold on, have you thought about that? That pause, and that question, are very important. And that builds the credibility of RTD by being transparent in decision-making and being extremely collaborative.

We create focus group meetings, where we hear people in a smaller group and understand what their concerns are, and let that decision from then onward be data driven. Once we hear these thoughts, we have to understand how do we implement, how does it impact, how much we impact, what is the intensity, how do we recover from it. All these are critical questions that need to be discussed beforehand. For example, right now for the project starting in May, we need to work with CCD (City and County of Denver), Convention Center, Five Points Business District, Visit Denver and Auraria Higher Education Center. By having that conversation, we are isolating different groups that are getting impacted. And I'm pretty sure once we have meetings with these groups, we will understand more.

We have a project kickoff meeting on March 29 where there will be internal and external audiences. We are expecting 50 people. We have five public meetings scheduled where questions will be asked about this project.

We have to manage expectations, too. We are being collaborative, we are being inclusive, but we also have to be responsible. We are responsible for people's money and the money that we have allocated for the project. We have to have some tough conversations and decisions. I think it all can be summarized by being transparent, being collaborative and gaining trustworthiness by these actions.

Kevin Diviness: Part of the question was how people are going to get downtown. The next proposed service change calls for trains to be diverted to Denver Union Station. Bus service will be redesigned to help distribute people throughout downtown, including on the Free MetroRide. That's for this summer. The bigger project I think, like Jeet said, is lessons learned. There may be different solutions that have to be used when we get to that point, depending again on the phasing of the work, where they're going to start, where they're going to be closing service down. I think that's going to be a whole new plan. There are two answers to this question. There's one plan for this summer, and it'll be a different answer when we do this again with the larger project in the future.

What are the benefits to customers once construction is finished?

Kirk Strand: You'll have safe, reliable service and no new or reoccurring shutdown like they've been subject to for the last eight years. If you're a regular train user, you probably knew in the spring and the summer that the train wouldn't be an option for you for a certain number of days, and that should all go away relatively once this bigger project is done.

Bring us behind the scenes. What will the public see should they pass by crews that are working?

Jeet Desai: They will see, from a construction point of view, a lot of fences and banners. They will see a lot of construction crews working on it, and they will see bus detours. They will see street close-outs. Those are the normal business of doing construction.

From a construction point of view, we've been extremely cognizant of the impact to businesses and communities. We're not going to start doing it without having a strategy in mind to mediate those impacts. That is one thing that is important.

Second is safety is paramount to us. People might think, why can't you do this at night? That is an option, but we would have to seek a noise variance, and I don't think people are very enthused about large machinery and people working at night.

Kevin Diviness: It'll be a lot like what they see now on the 16th Street Mall: a lot of construction, pedestrian detours, and they have to keep their heads on a swivel as they're walking through the site. Make sure they know where they're going, how they're going to get there. Make sure they're following updates to the project: know what's open, what's closed.

Kirk Strand: Sometimes you will see specialized track equipment entering and exiting the construction site. We have things like tampers and ballast regulators and stuff like that that are track specific. It should pretty much look like a very large roadway construction project, similar to the 16th Street Mall or other things we have done.

One unique aspect that the rail has is we use thermite welding to melt the two rail heads together with magnesium and then aluminum oxide that reaches up to 4,000 degrees Fahrenheit, so that's kind of exciting. There are some unique things to rail construction that are different than roadway work.

What do you want people to understand about this project that we are not discussing?

Kevin Diviness: It's necessary and normal to replace aging infrastructure, and people can expect that we'll have to go through this eventually with all of our rail lines.

Jeet Desai: It is for the greater good. We are not doing this to cause intentional inconvenience, and hopefully people understand that this is beneficial for all constituents. This is a giant step in providing safe and more hassle-free operations in the future, and this work goes directly into agency strategy, connecting people and back to basics. This is something that we are doing strategically. It's not a knee-jerk impulse.

Kirk Strand: We've been doing this since 2015. The pace wasn't adequate. We were doing a lot of small cuts and repairing the patient all at once, and now we're going to rip it all open and then repair it all up. We're going to do it much faster, and in a much larger area. This is just a different pace and a different attitude toward getting this stuff done faster. This is a collaboration between Asset Management, Bus Operations, Capital Programs, Civil Rights, Communications, Finance, Legal, Procurement, Rail Operations and Maintenance of Way, Safety, Service Planning – everybody at RTD is involved in this.

By Laurie Huff