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Reimagining sustainable station transformation





COVID-19 put a spotlight on longstanding transit issues, but by adopting a new perspective, opportunities emerge to align and prioritize investments and community engagement. The industry can maximize sustainable revenue streams alongside rider fares.

The future of urban transit stations revolves around transit-oriented development. By making multimodal stations integral to the urban fabric surrounding them, agencies can reverse declining revenue trends.

4 keys to reimagining urban station transformation

Stations are the cornerstone for transit-oriented development. To maximize their potential for connecting people and places, incorporate these four focus areas into your organization's short- and long-term plans.

1. **Think beyond the station: Partnering with other stakeholders**
2. **View station capacity in a new light**
3. **Enhance the customer experience**
4. **Enable data-driven decisions**

1. Think beyond the station: Partnering with other stakeholders

Funding capital plans has long been an issue for agencies, and the pandemic exacerbated common financial struggles.

A station can provide capital in many more ways than rider fares. Mobility Oriented Development (MODe) addresses riders' needs while leveraging additional revenue streams using retail, commercial and housing development. MODe creates multimodal hubs that maximize ridership and strengthen economic activity in the communities surrounding stations.

MODe pivots to thinking about stations as an integral part of the urban fabric.

What type of nearby stakeholders could benefit from a shared vision and master plan? Bringing together partners from public and private agencies to build a destination station, which use residences, grocery stores, restaurants, office space and more to integrate the station into people's daily lives. Aligning common interests will maximize investment capital and value generation.

Being an attractive partner can greatly reduce or eliminate the need for public funding. [Improving Quality of Life through Transit Hubs \(developed using Arcadis' Mobility Oriented Development Benchmarking Index\)](#) highlights alternative capital sources agencies around the world are using or have used successfully.



Station Rotterdam Centraal, Rotterdam, Netherlands. With daily passengers expected to increase to 320,000 by 2025, Station Rotterdam Centraal had reached the limits of its capacity. We worked with ProRail to create a brand new station, leading the engineering, contract management, site management and cost management for the project. The new station, which opened in 2014, features wider passageways, retail shops and a bright main hall.



Who are your station's stakeholders?

Each community is unique, but some common station stakeholders agencies should consider include:

Public:

- Neighborhood associations and adjacent property owners
- Local environmental interest groups
- Historic preservation organizations

Private:

- Investors
- Technology providers
- Business improvement districts
- Urban and economic development organizations
- Chamber of Commerce



Diridon Station Concept, preliminary illustration



The Alameda, looking to downtown



West San Fernando Street, looking to downtown

Case study:

Transforming downtown San Jose at Diridon Station

San Jose, California

Diridon Station is the cornerstone of a plan to expand downtown San Jose.

The Santa Clara Valley Transportation Authority (VTA), City of San Jose, Caltrain and the California High Speed Rail Authority sought to reinvent Diridon Station — a major transportation hub in downtown San Jose.

We partnered with Bentham Crowell Architects to create the San Jose Diridon Station Integrated Station Concept Plan. This initial phase of the project addresses future needs for the design so passengers can seamlessly transfer between all transportation modes, as well as creating an organizational/governance model for the partner agencies to design, build and operate the station.

Sustainable, holistic design

The design encourages interaction and cohesiveness between transit systems, public space and private development. The station will serve as a connection point, not a barrier, between neighborhoods and transit modes.

Diridon will blend California High Speed Rail, Bay Area Rapid Transit, and Caltrain services with existing bus transit, VTA Light Rail and other rail passenger services that include Capitol Corridor, Altamont Corridor Express and Amtrak.

Placemaking efforts by the city and private developers include developing millions of square feet into commercial industrial space, retail space, restaurants, residential units and more. Drawing new businesses and residents to the area will increase density, enhancing ridership and local economic activity.

Long-term vision

The bold vision will establish Diridon Station as a true destination station and one of the busiest multimodal stations in North America. To support continuous growth, designs are emphasizing flexibility. Leaving room for current services to change ensures that the system can thrive long-term and the system will not be locked in by limited space.

2. View station capacity in a new light

It is time to reconfigure how we view ridership and station capacity. Historically it has been the most important success metric for every station, where capital programs focus solely on expanding capacity to deal with peak-time congestion. As a result, most facilities are grossly oversized for most of the day.

Currently, only 10-25% of offices in the U.S. are in use, and many people expect to continue to work from home. Now is the time to strategize techniques for spreading capacity. Instead of spending money on expanding or adding platforms, think about how rider behavior can be changed to optimize the existing capacity and make operations more cost-effective.

People might be creatures of habit, but a solid plan can positively alter their routines. One U.S. transit agency changed a subway station to bus-only during construction, and they were able to adjust passengers' attitudes and behaviors through information and outreach campaigns.

The current situation for transit owners and operators might be a larger challenge than station construction, but large-scale change is possible. When London hosted the Olympics in 2012, it launched a campaign to encourage riders to try different modes and commute times to avoid throngs of tourists traveling at traditional peak times. The city even worked with businesses to accommodate flexible schedules. All told, the system avoided overflows from the lighting of the torch to the closing ceremonies.

Spreading capacity with new modes or schedules – and clearly communicating the new advantages to riders – can entice people back to rail when COVID-19 is under control, as it will give the riders the space for safe travel.



Artist's rendering of Sydney Metro's Central Station. Transport for New South Wales asked Arcadis to conduct a MODex analysis of Sydney Central Station to evaluate how well the station performs as a multimodal hub, as a civic and mixed use destination for the communities surrounding the station, and as a catalyst for urban redevelopment. We are continuing to support Transport for New South Wales as the technical advisor on the Central Station Precinct Renewal Project.

3. Enhance the customer experience

One of MODe's key features is making stations more than places to get from A to B. In the past it was typical for towns or cities to be planned with distinct, separate areas for corporate businesses, retail areas and residential neighborhoods. Now, forward-looking plans are evolving toward "15-minute cities" where residents can have all their needs – for work, shopping, health, or culture – met within 15 minutes of leaving their doorstep.

Destination stations can play a vital role by including the types of places people want to visit on top of providing convenient access to other areas. Denver's Union Station, for example, was overhauled and reopened in 2014 as a multimodal transit hub that features a hotel, restaurants and other retail. In 2017, revenues hit levels initially projected to be reached in 2022. Importantly, the area around the station was redeveloped as well, increasing economic and residential growth in the city. This type of balanced, mixed-use development represents a necessary progression for U.S. transit's future.

Increasing customer safety and confidence

Even pre-COVID-19, for some people the thought of a transit station would conjure images of dreary caverns where trouble could be lurking. In a 2012 survey, 20% of women who did not use transit despite living near a station said they avoided it for fear of harassment or their safety on the train, at the station or on the walk to and from the station.

Social strategies around safety and security must be incorporated alongside financial strategies. Transit owners and operators should consider partnering with outside stakeholders to develop long-term solutions. Bringing together police, station operators, cleaning crews, organizations that assist homeless populations and other similar groups can provide longer-lasting, wider-reaching improvements.

Architecture can help create a welcoming atmosphere. Well-lit, open spaces with logical layouts can establish peace of mind for riders typically wary of riding alone. Other considerations to keep in mind are measures to help with future pandemics, such as social distancing restrictions, contactless fare systems and the like.

Case study:

Designing a safe, welcoming hub at Driebergen-Zeist Station

Utrechtse Heuvelrug, Netherlands



Driebergen-Zeist Station's dated design was affecting customer experiences. The area had frequent traffic jams, passenger waiting areas were in proximity to oncoming trains and bicyclists lacked a safe approach to the station.

Enhancing safety and amenities

Our experts developed an entirely new design for the redevelopment of the railway, the station and the surroundings. The station was redesigned into a modern hub that solves riders and the local communities' biggest concerns. A through road was relocated to alleviate traffic congestion. The station square now sits under the tracks, creating a safer place to wait for trains. Bikers received a dedicated lane to enter the station square, and even have the option to park their bicycles in a new, 3,000-space covered parking structure.

Riders' comfort was also addressed. Better seating, WiFi access and power outlets give people the ability to stay connected and extend their workdays while on the move.

Maintaining the area's distinct identity

The spatial design carefully nestled the road, track and station between existing listed trees and historic estates. Maximizing the green infrastructure established a welcoming environment, facilitating local stakeholder acceptance and ease of use.



4. Enable data-driven decisions

Short- and long-term station planning should also incorporate data-driven insights. Behind-the-scenes digital solutions can drive better customer experiences. Data monitoring and analytics can track an entire system to find the root cause of delays. They can even enable proactive maintenance plans to minimize downtime and costs. Advanced analytics helped Metro St. Louis increase their mean time between failures by 17,000 hours and added three years to their average bus lifecycle.

Advanced analytics can also help manage the flow of traffic within a station. Bluetooth transmissions can evaluate walking patterns to determine where signage is needed, or if certain areas are prone to bottlenecks.

Some global transit networks use analytics to execute dynamic gating at bus terminals. Housing travelers in one customer-centric waiting area and directing them to gates in real-time increases station capacity without expanding its footprint, which could be especially useful when space for a station is limited.

Arcadis Gen – our new global digital business – recently introduced an advanced data analytics tool called the Universal Visual Optimizer (UVO). It is tailored to address the challenges raised by the ongoing global pandemic. UVO creates hypothetical scenarios to inform project and capital investment planning, offering a fast-to-implement process and affordable next-generation analytics based solutions.

Next-generation transit

While COVID-19 has been an extraordinary challenge for transit agencies, it has also placed a spotlight on industry trends that were already taking shape prior to the pandemic. To build future resilience and sustainability, agencies need to be more agile. By building a better understanding of transit agency assets' value and the potential to capture it through partnerships and other value capture mechanisms, agencies can emerge from the pandemic prepared to develop stations that become integral to local communities.

Assess your existing developments and align future priorities using MODE

MODE focuses on the integration of four key elements that bring value to transit hubs:

- connectivity
- urban environment
- social placemaking
- economic development

By quantifying these elements, refined according to our global experience and best practices, we created a rigorous framework to evaluate transit hubs. City leaders, economic developers and transit agencies can use the MODE tool to assess their existing mobility developments, align future project priorities, optimize investment value and deliver transit hubs that are economic catalysts for surrounding communities.



Bringing together collaborative teams that include planners, economists, urban designers and architects, Arcadis and CallisonRTKL provide an integrated, joint approach to transit-related planning and execution.

Want to know more about MODE? Access [the latest research](#) and [The Arcadis MODE Benchmarking Index](#) on our website.



About Arcadis

Arcadis is the leading global Design & Consultancy firm for natural and built assets. Applying our deep market sector insights and collective design, consultancy, engineering, project and management services we work in partnership with our clients to deliver exceptional and sustainable outcomes throughout the lifecycle of their natural and built assets. We are 27,000 people, active in over 70 countries that generate \$4.2 billion in revenues. We support UN-Habitat with knowledge and expertise to improve the quality of life in rapidly growing cities around the world.

www.arcadis.com

About CallisonRTKL

CallisonRTKL, a global architecture, planning and design practice, began over seven decades ago and has evolved into a cultural agency to advance positive outcomes in our local and global communities. Through a human-centric design approach our team addresses the imperatives of resiliency, wellbeing and technology and their influence in the built environment.

www.callisonrtkl.com

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