

Rail Transit Project Delivery in Mexico

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Mexico

Mexico has built nine rail transit projects, mostly concentrated around Mexico City, since 2000. The country has three major levels of government: federal, state, and municipal. Responsibility for planning and delivering transit projects is largely shared between states and the federal government, with limited local-level participation.

Mexico has some of the highest per-mile construction costs among democratic countries around the world, but not as high as in the United States. This is despite relatively weak standards for environmental assessments and community outreach. The one Mexican project with comparatively low costs, the Tren Suburbano, made use of existing railway right-of-way and is 100 percent at grade.

Table 1: Mexican rail transit projects completed since 2000

Location	Project	Opened	Time to Construct (months)	Length (miles)	Percent Tunneler	Cost*	Cost per Mile*
Guadalajara	Guadalajara Line 3	9/2020	73	13.3	25	4,174	313
Mexico City	Mexico City Line B Extension	11/2000	**	6.3	100	2,684	424
Mexico City	Tren Suburbano	5/2008	**	16.7	0	1,424	85
Mexico City	Mexico City Line 12	10/2012	49	14.9	30	4,525	303
Mexico City	Mexico City Line 12 Extension	2023**	**	2.2	100	1,111	512
Mexico City	Toluca-MX commuter rail	2023**	**	35.7	50	10,098	283
Monterrey	Monterrey Line 2 Extension Phase 1	10/2007	26	2.0	44	338	170
Monterrey	Monterrey Line 2 Extension Phase 2	10/2008	38	3.3	0	**	**
Monterrey	Monterrey Line 3	2/2021	88	4.7	0	1,231	265

* = 2021 USD in Millions

** Line not yet opened or information not available

Governance

The United Mexican States is a federal presidential republic. Its constitution establishes three discrete levels of government: the federal government, the state governments (of which there are 31, plus Mexico City), and municipalities. Within the federal government, there are three branches — executive, legislative, and judicial — and the

legislature is bicameral. The president heads the executive branch and appoints cabinet ministers to lead several departments. Mexico is a civil law country.

Within the **federal government**, the Secretary of Communications and Transport (SCT) oversees public transit projects and works closely with the Secretary of Territorial, Urban, and Agrarian Development (SEDATU) to prepare medium- and long-term transportation development plans. The federal government finances infrastructure projects through the National Bank of Public Works and Services (BANOBRAS), an infrastructure bank run out of the Ministry of Finance.

State governments establish transit agencies that build, operate, and maintain transit service throughout Mexico. Transit agencies serve as project sponsors and conduct early-stage, pre-investment feasibility analyses, then work with the federal government to register projects for funding. Transit agencies are also responsible for carrying out the bidding process for project construction contracts.¹

Three urban rail networks have expanded in Mexico since 2000. Mexico City Metro is owned and operated by the Sistema de Transporte Colectivo (STC), a division of the Mexico City government.² Metrorrey (officially the Sistema de Transporte Colectivo Monterrey) is a state agency in Nuevo León.³ The Guadalajara light rail system is operated by the Sistema de Tren Eléctrico Urbano (SITEUR) and owned by the state government of Jalisco.⁴ Private companies provide many bus services, sometimes with minimal regulation or government oversight. In these cases, transit services can fall under the jurisdiction of state agencies that are not specific to transportation, such as a public safety department.⁵ Municipal participation in rail transit development or operation is minimal.

Mexico City, which has the largest rail network in the country, is a municipality and equivalent to a state. In the past it was controlled tightly by the federal government, but in a 2016 governance reform it gained more autonomy, ended its role as a “federal district,” and is now officially known as the Ciudad de Mexico. Both the previous federal district and the current Ciudad de Mexico oversaw several large transit projects.⁶

STC is a public organization that was established by a 1967 decree. Its Department of Engineering and Technological Development hosts teams that are focused on managing new projects, systems management, and strategic planning. In other areas, **regional commissions** have been established to facilitate planning and decision-making between jurisdictions and across different levels of government. However, these commissions have limited influence.⁷

Project planning and regulation

Medium- and long-term planning for transportation investments begins at the federal level. The SCT and SEDATU follow the National Development Plan and the National Infrastructure Program, whose combined goals are to foster sustainability across sectors and create a transportation-specific agenda to meet those goals. The Inter-ministerial Commission for Public Expenditure, Financing, and Disincorporation decides which projects to include in the annual federal budget, prioritizing them based on profitability, effects on poverty reduction, regional development, and synergies with other development.⁸

As part of the planning process, the finance minister conducts cost-benefit analyses, including an evaluation of different alternatives, for all projects involving public investment.⁹ Following the federal long-range planning process, states (or, less often, municipalities) prepare pre-investment feasibility analyses funded in part by the National Infrastructure Fund (FONADIN), part of the national infrastructure bank.¹⁰ Sometimes this process is conducted by third-party consultants, as was the case with the Guadalajara Line 3 light rail, where the pre-investment studies were conducted by the same firm that performed project management during the construction phase.¹¹

Project sponsors initiate environmental review and related assessments and present them to the Secretariat of Environment and Natural Resources (SEMARNAT) for review.¹² Similar to the U.S. National Environmental Policy Act process, there are different categories of review depending on the potential harms attributed to the project, with some reviews requiring more in-depth review by SEMARNAT. Railway projects are required to prepare an environmental impact statement (EIS). The EIS must contain information like development plans, ties to planning and zoning laws, and a description of the regional environment composition.¹³

SEMARNAT rules on whether the project can proceed within 60 days of receiving the EIS. This period can be extended for an additional 60 days if needed. Within SEMARNAT, the Federal Attorney General for Environmental Protection (PROFEPA) oversees compliance with the EIS through public input, notification from SEMARNAT of infringements, and internal audits.¹⁴ According to interviewees and published sources, the public usually does not participate in the outreach process in a meaningful way, although there has been increased public demand for government agencies to incorporate more community participation into their planning efforts.¹⁵

Project permits must be obtained from all levels of government, depending on the permit type. For example, federal authorities issue permits for large-scale projects and projects in protected areas; state authorities issue licenses for noise, waste management,

and atmospheric emissions; and local authorities issue permits for urban waste and drainage.¹⁶

In November 2021, the national government issued new guidelines stating that certain major infrastructure projects that “promote public interest and national security” will be fast-tracked by the administration, which selects these specific projects. The only rail transit project designated under these guidelines has been an intercity tourist rail line called the Mayan Train. Many have disputed this authorization, including indigenous groups.¹⁷ It is unclear whether this authority will be extended to other rail transit projects.

Project funding

Mexico’s transit funding is shared between the federal government and state government agencies. BANOBRAS provides long-term financing and grants to private developers and state and municipal governments.¹⁸ For projects in Mexico City, funding comes from both the federal government and the Mexico City government. In the case of Line 12, for example, the federal government provided 28 percent of funding and the Mexico City government provided the remainder.¹⁹

FONADIN, part of the national infrastructure bank, supports projects to implement the National Infrastructure Program. Aside from providing some grant funding, FONADIN specifically encourages the use of private and tollway financing in infrastructure development. FONADIN oversees more than 50 toll highways throughout the country, and revenue from those tollways is used to support rail and other infrastructure development.²⁰

The Federal Support Program for Mass Transportation (PROTRAM) provides grants and technical assistance to public and private sector entities. The goal of the program is to promote low-carbon transportation projects.²¹ PROTRAM is situated within FONADIN and targets cities with a population of more than 500,000.²² The program offers grants of up to 50 percent of planning costs and up to 50 percent of infrastructure costs for projects that have at least 34 percent private investment.²³ It is primarily used for bus rapid transit, but light and heavy rail systems are eligible for funds. Funds are granted on a project-by-project basis and are earmarked in legislation.

Project construction

Rail transit projects are typically constructed by state-level public works or transit agencies. Projects are often broken up into stages, and project delivery oversight

responsibilities can vary between government agencies if a rail line crosses jurisdictional boundaries. For example, oversight for the Mexico City-Toluca rail project is split such that the federal government is responsible for the western two-thirds of the line and the Mexico City government is responsible for the eastern third.²⁴

Most rail transit projects in Mexico are built through design-build contracts. In other cases, P3s help finance long-term operations. For example, the Tren Suburbano, which operates between Mexico City and the State of Mexico, drew funding from all levels of government as well as a 30-year concession for rolling stock, construction, and operations.²⁵ The Railway Services Regulatory Law sets guidelines for the process to establish P3 contracts for rail projects, including that the national government leads in establishing details like minimum service requirements and maximum fare rates.²⁶ BANOBRAS leads the bidding process.

Underground projects have been built using a mix of tunnel-boring machines, as in the case of Guadalajara's Line 3, and cut-and-cover, as in the case of portions of Mexico City's Line 12 (the rest of which was completed using a tunnel-boring machine).²⁷ The Tren Suburbano made use of existing rail tracks, which reduced the cost of obtaining right-of-way and constructing new facilities. The federal government managed the construction of pedestrian and vehicle crossings that were added around the existing infrastructure, and created an operational arrangement for safe sharing of tracks between passenger and freight trains.²⁸

Tragically, 26 people died and more than 100 were injured after faulty structural welds led to a collapse of an elevated section of Mexico City's Line 12 in May 2021. Media outlets reported that construction of the line was plagued by cost overruns, design flaws, defective construction materials, corruption, and conflicts of interest.²⁹

Takeaways

Transit construction in Mexico is a state-led affair with little input and involvement from local governments. Since transit agencies are state entities and most large metro areas are fully contained within state boundaries, this helps unify regional transportation plans coordinated across local jurisdictional boundaries. And unlike in the United States, the federal government becomes directly involved when lines cross state boundaries, as they do around Mexico City.

Mexico is able to build transit at a lower cost per mile than the United States, but it is still costlier than in other countries, averaging more than \$450 million per mile for tunneled rail. It is unclear exactly why Mexico experiences higher costs, but some interviewees suggested that greater local involvement and addressing concerns about

corruption and conflicts of interest could help. Additionally, changes in federal priorities between administrations and lack of buy-in at the local level have created delays or major changes on some projects, leading to higher costs.

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- ¹ Banco Nacional de Obras y Servicios Públicos, “Urban Transport: Investment Cycle,” 2021.
 - ² “Acerca de,” Sistema de Transporte Colectivo, Gobierno de la Ciudad de México, 2022.
 - ³ “Acerca de esta dependencia,” Sistema de Transporte Colectivo (METRORREY), El Gobierno del Nuevo León, 2022.
 - ⁴ “Misión, Visión, y Valores,” SITEUR, Sistema de Tren Eléctrico Urbano, Jalisco: Gobierno del Estado, 2022.
 - ⁵ Abel Lopez Dodero, “Planning Public Transport Improvements in Mexico: Analysis of the Influence of Private Bus Operators in the Planning Process,” University of Waterloo Doctoral Thesis, 2013.
 - ⁶ Boris Graizbord and José Luis González Granillo, “Urban Growth and Environmental Concerns: The Venture of the Greater Mexico City Metropolitan Area,” *Politics Policy* (47) 2019.
 - ⁷ Lopez Dodero 2013.
 - ⁸ Banco Nacional de Obras y Servicios Públicos 2021.
 - ⁹ Leigh B. Boske, Lisa Loftus-Otway, and Nathan Hutson, “Evaluation of Mexican Transportation Infrastructure Projects,” University of Texas at Austin, Center for Transportation Research, 2009, p199.
 - ¹⁰ Banco Nacional de Obras y Servicios Públicos 2021.
 - ¹¹ SENER, “SENER Engineering, Commissioned to Develop New Line 3 of the Guadalajara Metro,” 2020.
 - ¹² Solcargos, “Environmental Permits and Impact Assessments in Mexico,” 2018.
 - ¹³ Commission for Environmental Cooperation, “Summary of Environmental Law in Mexico,” 2003.
 - ¹⁴ *ibid.*
 - ¹⁵ Boske, Loftus-Otway, and Hutson 2009.
 - ¹⁶ Solcargos 2018.
 - ¹⁷ Reuters, “Mexican President Defends Move to Expedite Public Works,” November 23, 2021; Shannon Young, “AMLO Pushes Ahead on Militarized Megaprojects,” The North American Congress on Latin America, August 21, 2020.
 - ¹⁸ Banco Nacional de Obras y Servicios Públicos 2021.
 - ¹⁹ Global Mass Transit Report, “Mexico City Metro: System Upgrade and Expansion,” 2015.
 - ²⁰ Banco Nacional de Obras y Servicios Públicos 2021.
 - ²¹ Desarrollado por el Centro de Transporte Sustentable de México, “Integrated Urban Mobility Systems as a Crediting Mechanism,” 2012.
 - ²² Fondo Nacional de Infraestructura, “Products and Programs,” n.d.
 - ²³ Desarrollado por el Centro de Transporte Sustentable de México 2012.
 - ²⁴ “Mexico City-Toluca Rail Could Start Operations This Year,” *BNAmericas*, February 19, 2019.
 - ²⁵ Callida Cenizal, “Governing the Metropolis: The Evolution of Cooperative Metropolitan Governance in Mexico City’s Public Transportation,” Massachusetts Institute of Technology Masters Thesis, 2015; Beatriz Rutzen, Nathan Hutson, Lisa Loftus-Otway, “Mexico City, Mexico, Commuter Rail: Planning and Implementation of Multijurisdictional, Public-Private Partnership Project,” *Transportation Research Record*, January 1, 2010.
 - ²⁶ Boske, Loftus-Otway, and Hutson, 2009.
 - ²⁷ Agencia EFE, “Light-Rail Tunnel Project to Transform Mexican City’s Urban Transport,” 2017; Desiree Willis, “Visiting Mexico City’s Newest Metro Tunnel: How the Country’s Capital is Upgrading its Aging Infrastructure,” *Robbins*, November 15, 2010.
 - ²⁸ Boske, Loftus-Otway, and Hutson 2009.
 - ²⁹ Jim Parsons, “Flawed Welding Faulted in Mexico City Subway Collapse,” *ENR*, September 8, 2021; “Report blames poor welds for Mexico City subway collapse”, *PBS (AP)*, September 7, 2021; “Study finds huge cost overruns on three major infrastructure projects,” *Mexico News Daily*, October 11, 2018; Natalie Kitroeff, Maria Abi-Habib, James Glanz, Oscar Lopez, Weiyi Cai, Evan Grothjan, Miles Peyton and Alejandro Cegarra, “Why the Mexico City Metro Collapsed”, *New York Times*, 12 June 2021.

Eno

Center for Transportation

1629 K Street, NW
Suite 200
Washington, DC 20006

www.enotrans.org

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