DRAFT Technical Memorandum for Transit 2.0 Task 8: Financial and Scenario Modeling Analysis of Transit's Future

North Central Texas Council of Governments

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Introduction

Context and Scope of Task 8: Financial and Scenario Modelling Analysis of Transit's Future

NCTCOG has projected a significant increase in the population of the Dallas-Fort Worth (DFW) Metroplex with approximately 4 million residents moving into the region by 2050.[1] This population growth will drive increased transportation demand in the region.

Given this expected growth, Task 8 seeks to provide a high-level model of potential transportation scenarios through 2050. Modelling both the current transportation infrastructure and various degrees of improvement and/or expansion, Task 8 measures operational outcomes – such as traffic congestion and transit mode share – as well as Transit Authority (TA) financial outcomes. This modelling takes the form of three scenarios for the region through 2050:

1. **Baseline scenario**, representing current transportation infrastructure and existing TA strategic plans, for which there are expected to be modest improvements in transit service[2]

2. **Transit 2.0 policy scenario,** representing the implementation of Transit 2.0 policies to drive density-oriented economic development and improve transit system competitiveness, among other recommendations from Transit 2.0 Tasks 2-7

3. **Network expansion scenario,** representing ~$15B of capital expenditure on nine rail projects and several new bus routes; *includes implementation of Transit 2.0 policies in existing service areas*

This memo leverages this modelling to provide preliminary considerations of various interventions the region may take to meet increased travel demand through 2050. This report is not intended to serve as a detailed operational guide for the future of transit in the region nor does it intend to make normative policy recommendations. Rather, the memo leverages a 25-year strategic model to elucidate the potential financial and operational impacts of Transit 2.0 policy or capital expansion decisions the region may make. Many of these preliminary considerations may require further discussion and analyses to inform decision-making.

[1] "North Central Texas Regional Transit 2.0: Planning for Year 2050 RFP" (NCTCOG, 2023).
[2] This does not include DART Mobility+ Network plans to introduce bus and LRT service improvements, as funding of these improvements is not reflected in its 20-year financial plan.

Some topics discussed in this report intersect with other tasks included in Transit 2.0. They are covered in more depth in those task reports, whereas this report will focus on their relevance to the scenario modelling and regional outcomes. For example,

- Enabling additional revenue levers for TAs (Task 2)
- Adopting collaborative efficiencies across TAs (Task 4)
- Delivering more competitive and attractive transit (Task 5)
- Economic development and transit-oriented development (Task 6)

This report and modelling were validated by several sources of insight. These sources include, but are not limited to, relevant materials from NCTCOG, DART, Trinity Metro, and DCTA; interviews with industry leaders, NCTCOG, and TA stakeholders; and external benchmarks such as the FTA National Transit Database. Potential solutions were analyzed for possible impact and tested with relevant experts and NCTCOG and transit authority leadership. NCTCOG leadership encouraged out-of-the-box ideas be contemplated and commented on in this report.

Executive summary of findings

The Dallas-Fort Worth Metroplex stands at a crossroads, as its current approach to transportation and development will not meet future travel demand. Despite $100B in planned investments, roadway capacity will be outpaced by the anticipated population growth of 4 million residents – much of which will be outside TA service areas -- **over the next 25 years, driving a sharp rise in traffic congestion. Vehicle hours of delay are forecasted to nearly triple by 2050, imposing costs on DFW residents and businesses.**[3]

Implementation of Transit 2.0 policy initiatives, especially around density-driven economic development, is shown to address this challenge. With modest additional investment, Transit 2.0 policy initiatives could **significantly improve regional outcomes** through 2050 (e.g., 20% reduction in vehicle hours of delay, 65% increase in transit ridership versus 2050 baseline). These policies **leverage and help unlock the full value of the region's substantial transit investments** over the past 40 years to **maximize value for the public dollar.**

Similarly, proposed transit expansion projects may face the same types of challenges faced by the existing transit system without complementary investments in dense development (e.g., along

[3] Based on data and preliminary findings developed for NCTCOG's 2050 Metropolitan Transportation Plan

proposed new rail corridors). Without these complementary investments in density, building new rail lines may not be a cost effective approach to meeting increased travel-demand in the region.

To **effectively steward public dollars and meet future travel demand, the region could focus on implementation of Transit 2.0 policy initiatives**, with a primary focus on density-oriented economic development.

Section 1: Current understanding of the situation

The Dallas-Fort Worth Metroplex is at a crossroads, as it will be unable to meet the travel demands of substantial population growth. With an anticipated influx of 4 million residents over the next 25 years, the region's population will surpass planned roadway capacity, leading to a significant increase in traffic congestion (e.g., vehicle hours of delay are expected to nearly triple by 2050).

Congestion and its costs

NCTCOG's Travel Demand Model[4] projects that regional congestion will significantly increase if the region continues its current trajectory. Current regional plans for future transportation infrastructure include $100B in spend on roadway improvements/expansions and only modest improvements to the regional transit network and service offerings. This, however, will not be sufficient to meet travel demand as 4 million residents move into the region. **Vehicle hours of delay are expected to nearly triple by 2050 versus 2019, increasing from 1.8 million to 4.9 million**. This equates to approximately 50 minutes per resident per day spent in traffic delays,[5] driving projected increases in home-based work (HBW) commute times from 25.4 to 30.4 minutes on average.

Historically, increased investment in roadway infrastructure has supported regional growth, but this strategy alone will not meet travel demand by 2050. The substantial increases in traffic delays are forecasted despite approximately $50B investments in roadway solutions to reduce congestion, including the addition of High Occupancy Vehicle (HOV) lanes to increase vehicle occupancy and expansion of tollways/freeways to increase vehicle capacity. [6]

Already, many DFW residents express dissatisfaction with the current transportation infrastructure and its ability to meet regional travel demand. A survey of more than 4,000 people – conducted by NCTCOG – highlights that one of residents' biggest complaints with the region is that roadway infrastructure isn't keeping pace with growth.[7] These complaints would likely be exacerbated as the population grows and traffic delays increase.

[4] A Travel Demand Model is a system of computer programs that include inputs of roadways, transit networks, and population/employment data to forecast future travel for a metropolitan area, based on the variety of transportation choices residents make and how those choices result in trips on the transportation network.
[5] Calculated on a per capita basis with projected regional population in 2050, twice that of NCTCOG TDM's projections of vehicle hours of delay, as this is measured from only 6:30am-3:00pm.
[6] "Mobility 2045," Metropolitan Transportation Plan for North Central Texas (2022).
[7] "North Texas residents say they want more transit" (Dallas Morning News, 2024).

Transit offers a potential alternative to congested roadways. However, **North Central Texas residents are dissatisfied with current transit offerings**, seeing them as broadly inconvenient.[8] This dissatisfaction has contributed to the low utilization of current transit service offerings, with residents instead relying on single-occupancy vehicles, a driver of roadway congestion. Even in the more urban counties – with areas currently serviced by transit – transit mode share was only 1.9% in 2019, with this number expected to fall to 1.4% by 2050 without intervention. **Additionally, much of the regional population growth is expected in areas outside of existing transit authority boundaries**, as the population living inside these service areas will fall from 47% to 38% of the total North Central Texas population by 2050.[9] This could further increase the number of residents relying on single-occupancy vehicles.

This level of congestion will have significant consequences for cities in the region:

- **Increased costs for businesses:** Congestion would be costly for businesses and may discourage firms from operating in the region. Traffic delays result in lost productivity time and increased fuel usage. Further, congestion disrupts just-in-time delivery systems, which increases inventory costs.[10]

- **Constrained labor market:** When traffic congestion in urban areas is significant, long-run employment growth is dampened, likely because congestion drives additional costs for workers which raises their wage expectations and/or reduces their travel radius to commute to work, restricting employers access to talent[11]

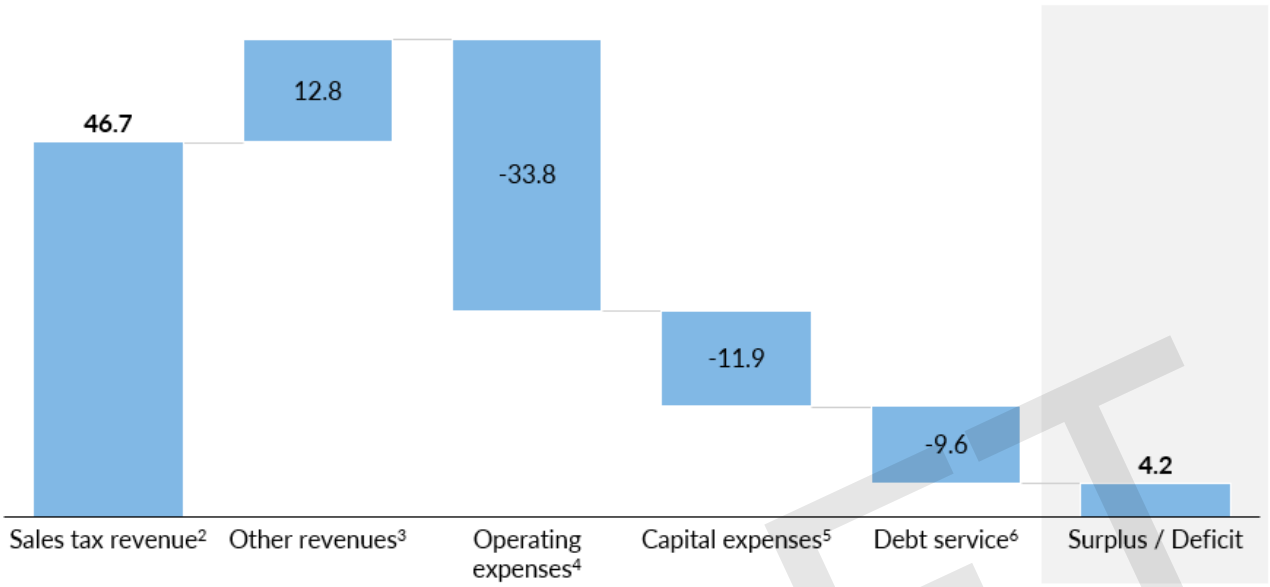
- **Residents' diminished well-being:** Smog, traffic jams, and vehicular noise pollution are cited as frequent points of frustration for urban dwellers.[12]

Baseline financial picture

The current TA financial picture reflects a balanced budget with limited surplus for unforeseen challenges and/or transit system network expansions.

[8] "North Texas residents say they want more transit" (Dallas Morning News, 2024)
[9] "North Central Texas Regional Transit 2.0: Planning for Year 2050 RFP" (NCTCOG, 2023)
[10] "Increasing Mobility in Southern California: A New Approach" (Reason Foundation, 2015)
[11] "Does traffic congestion reduce employment growth?" (Journal of Urban Economics, 2008)
[12] "Urban mobility at a tipping point" (McKinsey, 2015)

Projected cumulative cash flows across NCT TAs, baseline scenario, 2025-2050[1]
$ billions



1. Figures may not sum to bar totals due to rounding | 2. Assumes 3.8% annual growth rate in years beyond TA forecasts | 3. Assumes 1.0% CAGR for farebox revenues, 2.7% CAGR for other O&M revenues in years beyond TA forecasts, based on DART's inflation forecast for 2025-2044 | 4. Assumes 2.7% CAGR for O&M costs in years beyond TA forecasts, based on DART's inflation forecast for 2025-2044 | 5. Includes additional 3% SOGR assumption for DART, assumes 3.5% CAGR for CapEx | 6. Includes DART financial forecasts from 2025-2044 and DART bonds maturing from 2045-2050, based on publicly available data |7. Assumes a 3% discount rate

Figure 1: Financial outcome of baseline scenario

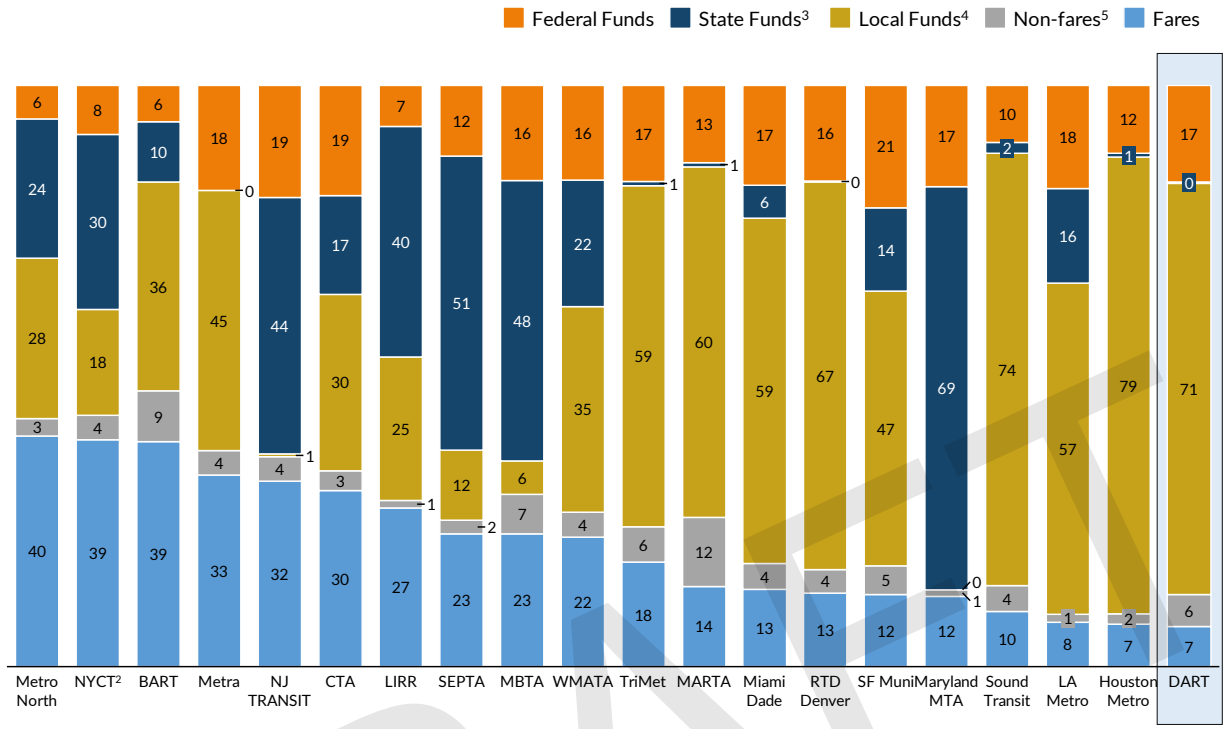
Revenues

A significant portion of revenues for the region's TAs is generated by sales taxes, which is in line with newer transit agency patterns. For example, at DART, state and local sources represent 71% of revenues, versus ~60-80% overall for newer transit agencies.

Further, the region's transit authorities receive limited state funding. DART is one of few major transit agencies to generate <1% of its revenue from state funds[13].

[13] National Transit Database (NTD)

Top 20 US transit agencies breakdown of funding sources by %, 2019[1]



Source: NTD

1. Year 2019 used to represent "typical" funding breakdown without federal COVID-19 relief funding
2. NYCT includes NYCT, MTA BUS
3. Incl. general funding, state transportation funds; 4. Incl. income, sales, property, fuel, and other taxes, licenses, and misc.; 5. Incl. leases, parking, ads, concessions

Figure 2: Funding composition of US transit agencies

Additional revenue sources for transit in North Central Texas include farebox revenue, federal formula and discretionary funding, and debt issuance.

Costs

Operating expenses represent ~60% of cumulative expenses through 2050 driven largely by labor costs (~80-85% of total operating expenses). Materials costs (~15-20% of total operating expenses) include fuel, lubricant, and maintenance supplies, among other line items.

That said, there are limited opportunities for the TAs to realize operating cost efficiencies. For example, DART performs in line with top peers in terms of operational efficiency per Vehicle Revenue Hour (VRH) for bus,[14] and current DART financial planning guidance already builds in

[14] National Transit Database (NTD)

ambitious efficiency gains by assuming operational expense increases of at most 90% of inflation year over year.

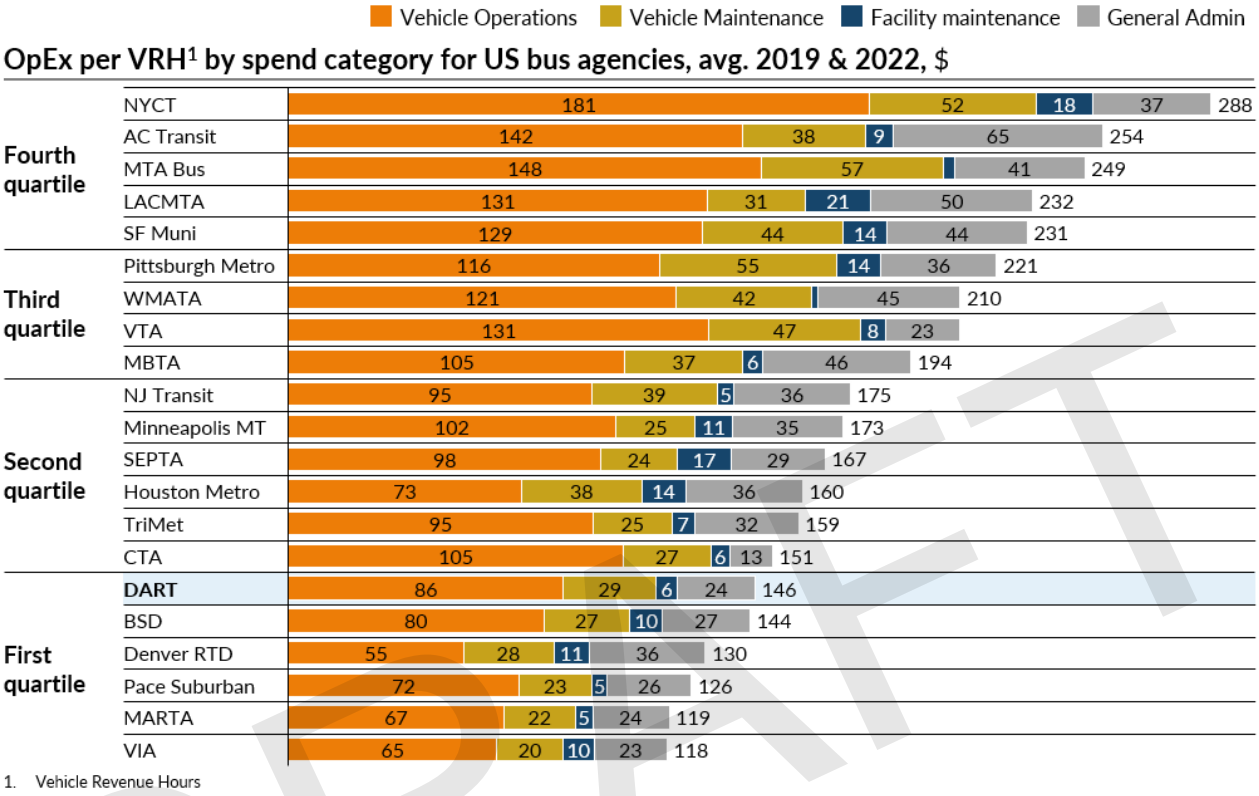


Figure 3: Operational efficiency of US bus agencies[15]

Further, **although the region is not currently planning to expand the transit system network beyond the Silver Line extension, there are still significant capital costs for TAs**. With a lack of major funded expansion projects on the horizon, capital costs are made up almost entirely by State-of-Good-Repair (SoGR) capital costs. These costs include regular vehicle replacement cycles of ~12-25 years for buses, light rail, and commuter rail vehicles. DART's extensive light-rail system also drives significant facility SoGR capital expenses for guideway, stations, signals, and other equipment, which will require increasing amounts of investment to maintain as they age based on trends observed from older peer transit networks (e.g., CTA, NYCT).

DART

Given that DART is the largest TA in the region, its financial picture is of particular interest. While DART is projected to run a cumulative surplus through 2050, it could begin the period with deficits.

[15] National Transit Database (NTD)

However, these deficits are currently funded by short-term debt and cash on hand, and DART's surpluses are expected to increase in later years as its sales tax growth outpaces inflation of expenses over time. A significant cost driver for DART is debt service as it continues to pay down long-term bonds issued over the last 20 years to fund recent network expansion. DART's outstanding debt is forecasted to decrease from $4.3B in 2025 to $1.9B in 2050. They are forecasted to spend nearly $10B servicing debt principal and interest over this 25-year period. The baseline forecast for DART accounts for the expected issuance of some new bonds over the next 25 years to fund system SoGR costs, such as vehicle replacements and major track work.

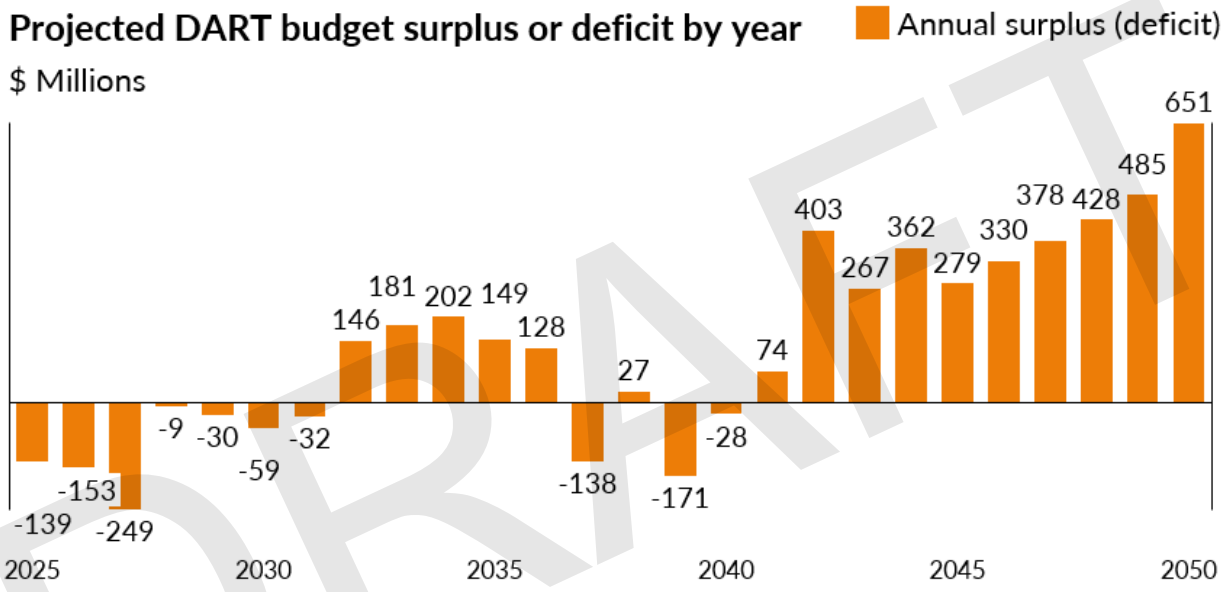


Figure 4: Projected cumulative DART budget surplus

Section 2: Transit 2.0 policy scenario

Transit 2.0 policy, especially density-driven economic development, could address some of these challenges. With modest additional investment, it could **significantly improve regional outcomes** through 2050, reducing traffic congestion and increasing transit ridership. These policies **leverage the region's substantial transit investments** over the past 40 years to **drive value for the public dollar.**

Transit 2.0 policy overview

The Transit 2.0 policy scenario represents potential outcomes of the adoption of Transit 2.0 policies. Out of the full range of potential recommendations coming from Transit 2.0 Tasks 2-7, **this scenario models four key pillars that are expected to have the greatest measurable impact to transit financial performance and regional transportation and economic outcomes. The four pillars evaluated in this Transit 2.0 policy scenario are summarized below. Further detail can be found toward the end of this section.**

1. **Density-oriented economic development:** The Transit 2.0 policy scenario assumes that Cities and NCTCOG partner with TAs to re-shape regional economic development and land use strategy around existing rail corridors.

    A. In addition to direct investment by cities and NCTCOG, TAs invest a portion of annual sales tax revenue to incentivize density, drive regional economic strategy, and accelerate development around stations (e.g., provide financial or other incentives for corporate relocation or expansion into member cities)

    B. Expand existing land use and economic development strategy teams to support member city and regional priorities (e.g., such as supporting policies enabling densities already seen around DFW)

    C. Expand existing efforts to leverage TA-owned real estate

    This scenario also assumes collaboration between member cities and NCTCOG to increase residential and employment density around rail stations. These actions, and others, are further described in Transit 2.0 Tasks 5 and 6.

2. **Competitive transit travel times:** The Transit 2.0 policy scenario assumes that TAs increase rail and bus service frequency and speed on the highest-demand corridors in the

region to increase travel time competitiveness with single-occupancy vehicles. This increase in transit speed and frequency matches best-in-class peer performance (e.g., 5–10-minute headways on light rail).

3. **Attractive transit service:** The Transit 2.0 policy scenario assumes that TAs make additional investments in safety, security, cleanliness, customer experience, and brand awareness to enhance public perception of transit. For example, Tasks 3-7 outline key aspirations for regional TAs, with the resulting shifts in consumer perceptions of transit modelled in this scenario:
    1. Safest public transit network in the country (i.e., driven by coordinated safety/security efforts across the region) based on peer benchmarks
    2. Facility and vehicle cleanliness on par with best-in-class global peers
    3. User experience in line with global peers (e.g., improved wayfinding, real-time data display at transit hubs, mobile application, alerts)
    4. Seamless payment methods integrated across TAs
4. **Efficient transit financial performance:** The Transit 2.0 policy scenario assumes that with three TAs in close proximity, the TAs can enhance efficiency through closer collaboration. For instance, this scenario models TAs consolidating targeted operational areas (e.g., procurement, commuter rail operations), leveraging synergies to avoid costs. While not represented in the financial modelling of the Transit 2.0 policy scenario, TAs could also consider leveraging private sector operators to improve transit performance, drive cost efficiency, and create capacity for TAs leaders to give additional focus to strategic priorities (i.e., versus operations).

The potential policy choices modelled in the Transit 2.0 policy scenario come primarily from:

- **Task 4:** Develop collaborations between three existing Transit Authorities (e.g., collaboration between authorities to realize efficiencies)
- **Task 5:** Develop strategies to foster Transit Authority board partnerships and teamwork (e.g., greater transit competitiveness)
- **Task 6:** Develop strategies for infill development (e.g., accelerated mixed-use development around rail stations)
- **Task 7:** Review fare collection strategies to increase ridership without lowering revenue (e.g., seamless integrated payment systems)

"Task 2: Develop a more aggressive transit legislature program" and "Task 3: Develop strategies to increase Transit Authority membership" are evaluated in the network expansion scenario, when considering the potential for new member cities and an expanded transit system network.

DART, DCTA, and Trinity have long-term goals to improve service that may be in line with Transit 2.0 policy initiatives. For instance, DART has improvement plans for bus service offerings, and the Transit 2.0 policy scenario modelling reflects a similar increase in bus vehicle revenue hours (VRH). However, **these improvement plans are not represented in the baseline financial scenario since they are not yet funded.**

Impacts of Transit 2.0 policy on regional outcomes

The adoption of these Transit 2.0 policy initiatives could drive significant progress against regional objectives, like congestion, while maintaining a balanced financial picture. For example, the Transit 2.0 policy scenario represents the following meaningful decreases in roadway congestion versus the 2050 baseline scenario:

- **Vehicle Hours of Delay:** The Transit 2.0 policy scenario demonstrates a 20% decrease in vehicle hours of delay. This decrease in vehicle hours of delay is driven by a 5% decrease in Vehicle Miles of Travel (VMT) and an 11% decrease in Vehicle Hours of Travel (VHT).

- **Commute Times:** The Transit 2.0 policy scenario demonstrates a 13% decrease in average Home-Based Work (HBW) regional commute times (26.6 minutes versus 30.4 minutes in the baseline scenario).

The Transit 2.0 policy scenario also represents the following increases in transit usage versus the 2050 baseline scenario, driving the above improved regional outcomes:

- **Transit ridership**: The Transit 2.0 policy scenario demonstrates a ~65% increase in daily transit ridership (~505k daily weekday unlinked passenger trips (UPT) versus ~305k weekday UPT, up from ~260k UPT in 2019).[16]

- **Transit mode share:** The Transit 2.0 policy scenario demonstrates a 60% increase in transit mode share in the urban core[17], approximately 2.2% (versus 1.4% by 2050 in the baseline scenario and 1.9% in 2019).

Moreover, Transit 2.0 policy is expected to drive $4.7B in increased sales tax revenues for member cities. This incremental revenue could help address the plateauing city tax bases that have financially strained member cities, including Dallas, in recent years.

[16] Represents NCTCOG TDM ridership scaled versus the sum of average weekday unlinked trips for DART, DCTA, and Trinity Metro in 2019, as reported in the NTD database.
[17] Transit mode share includes Dallas, Denton, Tarrant, Rockwall, and Collin County only.

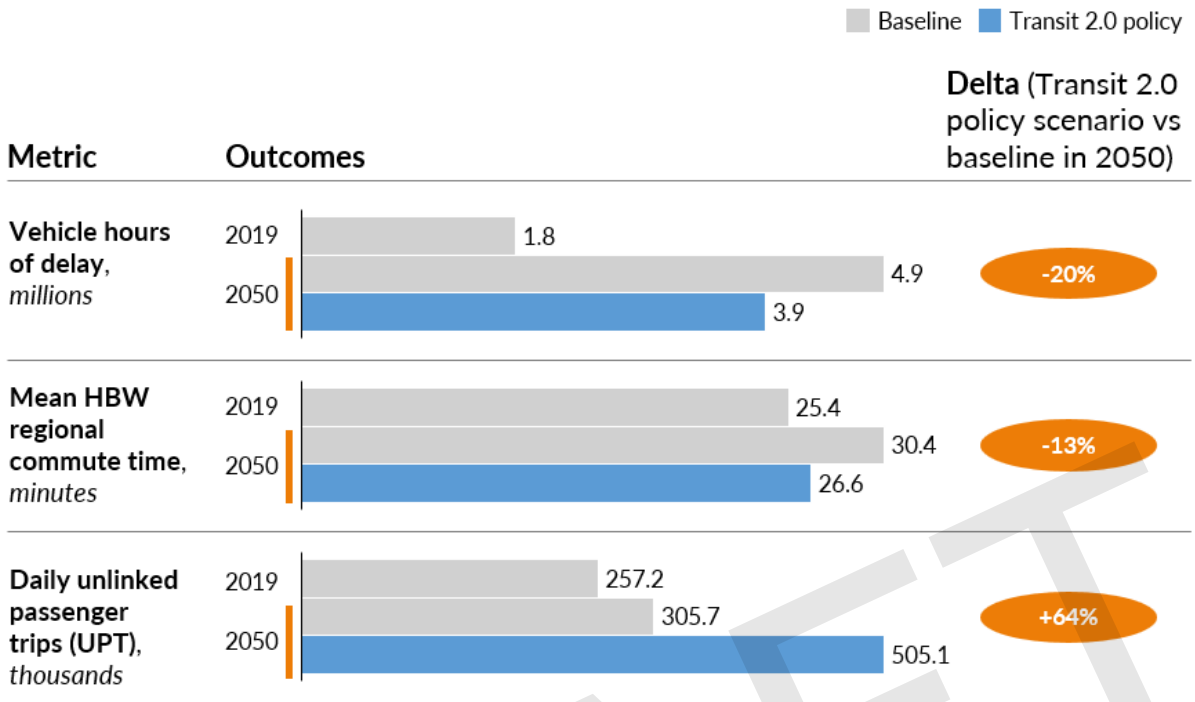


Figure 5: Operational impacts of Transit 2.0 policy scenario

Transit 2.0 policy scenario financial picture

The collective adoption of these Transit 2.0 policy initiatives could result in a balanced financial picture for TAs, as it would allow the region to largely leverage existing financial investments.

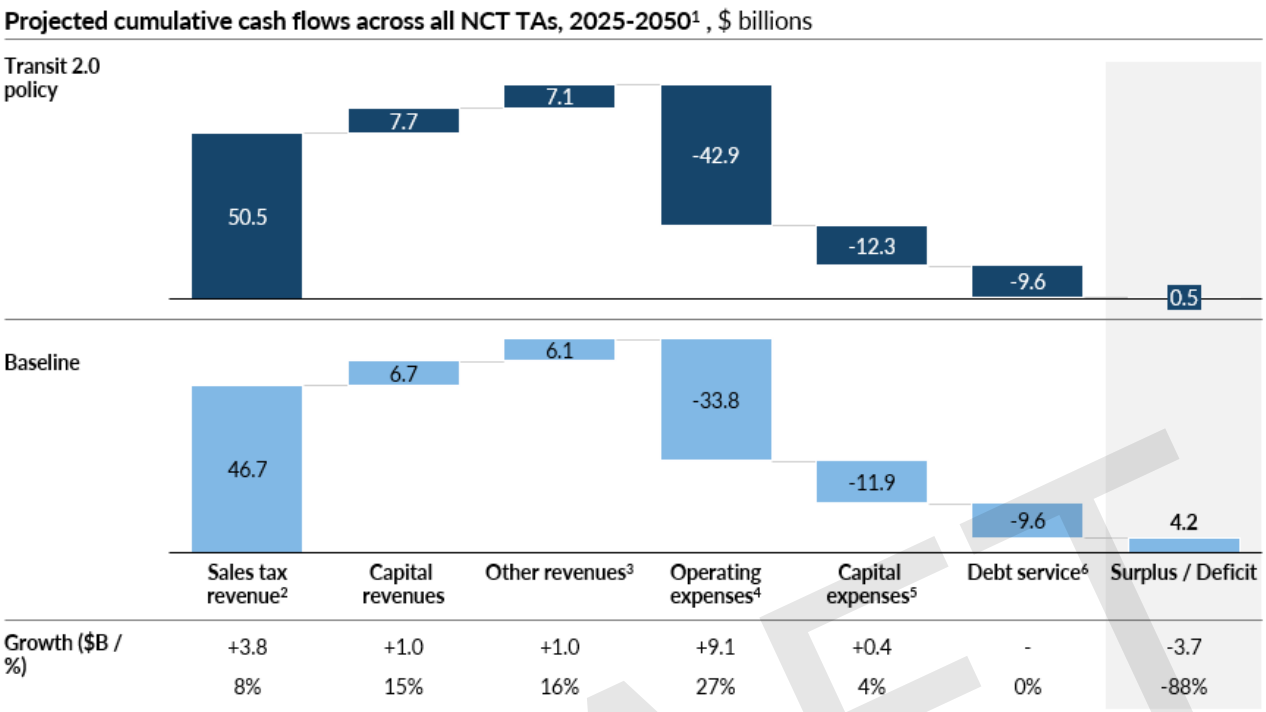


Figure 6: Financial picture for TAs under Transit 2.0 policy scenario and baseline (2025-50)

Key differences between the modelled Transit 2.0 policy scenario and the baseline scenario are as follows:

- **Sales tax revenue:** The region's TAs could realize an additional $3.8B in sales tax revenue
- **Capital and other revenues:** The TAs could realize an additional $2.0B in incremental farebox and other revenue
- **Operating expenses:** The TAs could see an incremental $9.1B in operating expenses driven by higher service levels and direct investments in density-oriented economic development equivalent to 5% of annual sales tax revenue

Drivers of change in the Transit 2.0 policy scenario

Adoption of the Transit 2.0 policy pillars may require limited incremental spend over the 25-year period. That said, the Transit 2.0 policy pillars modelled in this scenario could have a positive impact on the region's operational and/or financial outcomes, as previously described.

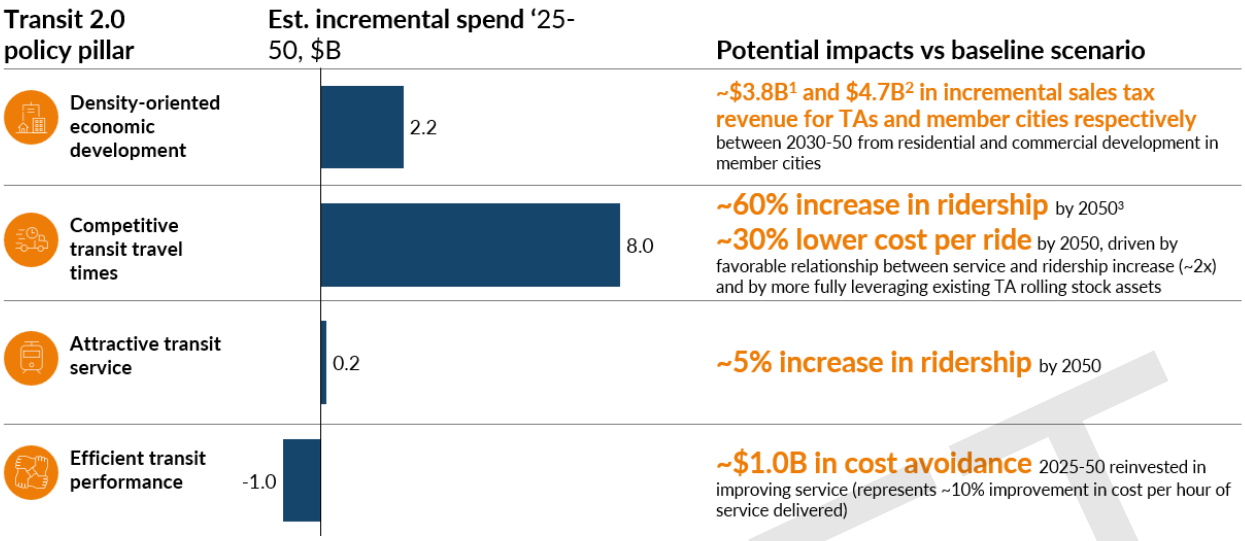


Figure 7: Incremental investments for Transit 2.0 policy pillars

1. **Density-oriented economic development: Of these four Transit 2.0 policy pillars, density-oriented economic development represents the most significant impact on regional outcomes.** With an illustrative $2.2B in cumulative incremental spend, this policy action could drive **increased residential and commercial development** in member cities, contributing to the substantial **incremental $3.8B and $4.7B sales tax revenue for TAs and member cities,** respectively. These outcomes are driven by several actions taken by TAs —in partnership with member cities and NCTCOG – to shape regional economic development and land use strategy, further detailed in a later section.

   Further, an increased population density in member cities could make it **easier for TAs to establish fixed routes** that transport a large volume of riders directly to their destinations or from their origins, minimizing the need for additional journey legs.

2. **Competitive transit travel times:** With an illustrative $8.0B in incremental spend, more competitive transit travel times could contribute to a **~60% increase in transit ridership**, better leveraging the existing transit infrastructure. Faster, more frequent rail and bus services[18] could enhance competitiveness with car travel, boosting consumer satisfaction; current riders expressed that transit times can be twice as long as driving.

[18] Matching best-in-class peer performance on the highest demand corridors in the region.

Further, this policy pillar could result in a **~30% lower cost per ride** by 2050, driven by the favorable relationship between service and ridership increase (~2x) and by more fully leveraging existing TA rolling stock assets.

3. **Attractive transit service:** With an illustrative $0.2B in cumulative incremental spend, a more attractive transit service could attract **~5% more ridership** by 2050. This outcome would be driven by additional investments in safety, security, cleanliness, customer experience, and brand awareness to enhance public perception of transit.

4. **Efficient transit performance:** More efficient transit performance, through consolidation of targeted operational areas across TAs, could help the region **save a cumulative ~$1.0B**, representing a ~10% improvement in cost per hour of service delivered. There are five levers the region could use to realize these potential cost savings, further detailed in the following section: 1) Region-wide consolidated demand response options, region-wide consolidated end-to-end (E2E) payment systems, 3) leveraging private sector operators, 4) collaborative procurement practices across TAs, and 5) consolidated commuter rail responsibilities.

Section 3: Network expansion scenario

The network expansion scenario in the Travel Demand Model and financial modeling represents significant expenditures on expansion of rail lines and new bus routes. These proposed expansion projects may be difficult to justify without additional investment in regional density.

This scenario models a future in which the DFW region stands up ~160 miles of new regional and light rail, resulting in an ~34% increase in overall service levels by 2050 versus the Transit 2.0 policy scenario. These new rail lines include the Frisco Line, McKinney Line, Silver Line Extension, Scyene Line, Green Line Extension, Midlothian Line, Waxahachie Line, Cleburne Line, and TEXRail Extension.

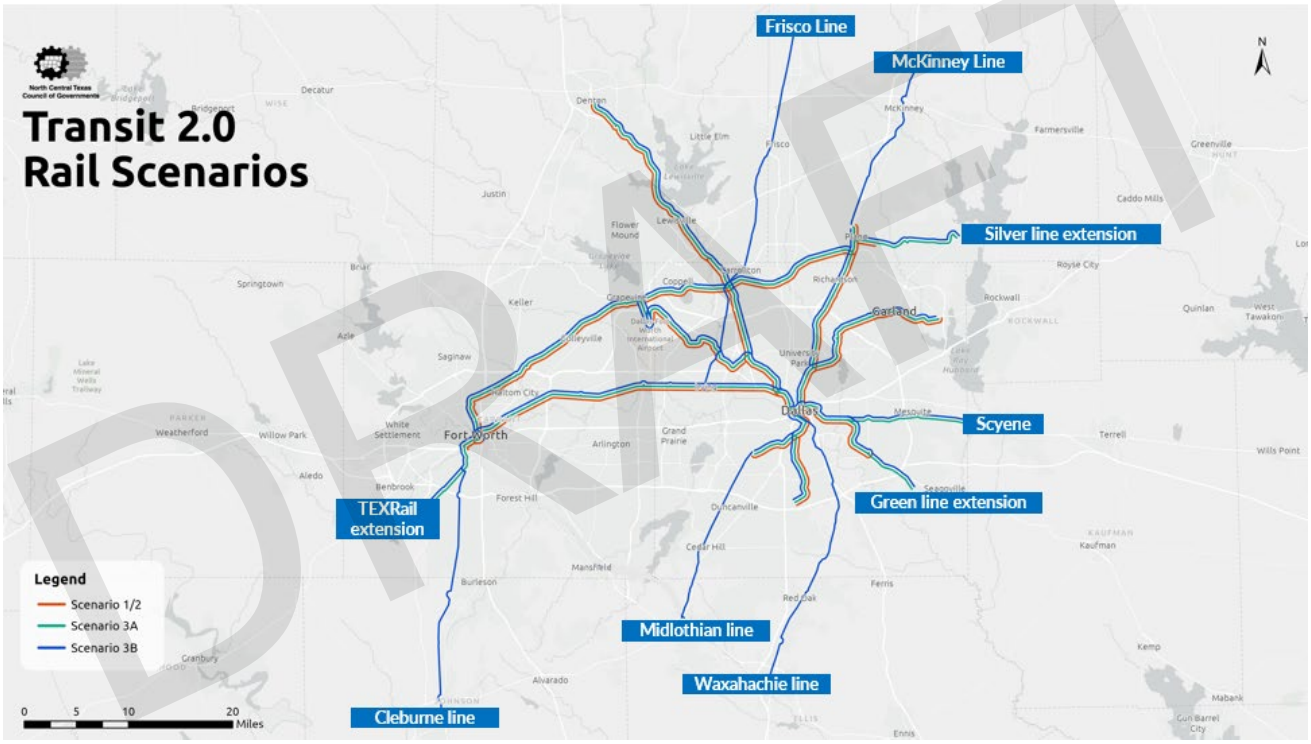


Figure 8: Proposed rail system routes

In addition to the network expansions, **this scenario also represents implementation of the aforementioned Transit 2.0 policy levers, including increased transit competitiveness in the current operating area. This scenario, however, does not include any increases in density around the new rail stations or in the new service areas** of the expanded network. As such, population growth and density in these areas remain the same as the baseline.

As a result, **the network expansion scenario does not represent significant impacts on regional outcomes when compared to the Transit 2.0 policy scenario.**

The proposed network expansions could increase weekday UPT by 27% versus the Transit 2.0 policy scenario, driven by incremental ridership on regional rail (+129%), bus (+19%), and light rail (+12%). Though ridership could increase, many residents would continue to rely on private vehicles, indicated by only a slight increase in transit mode share from 2.2% in the Transit 2.0 policy scenario to 2.7% in the network expansion scenario.

Still, despite this boost in ridership, **network expansion alone would likely not have large impact in reducing congestion.**

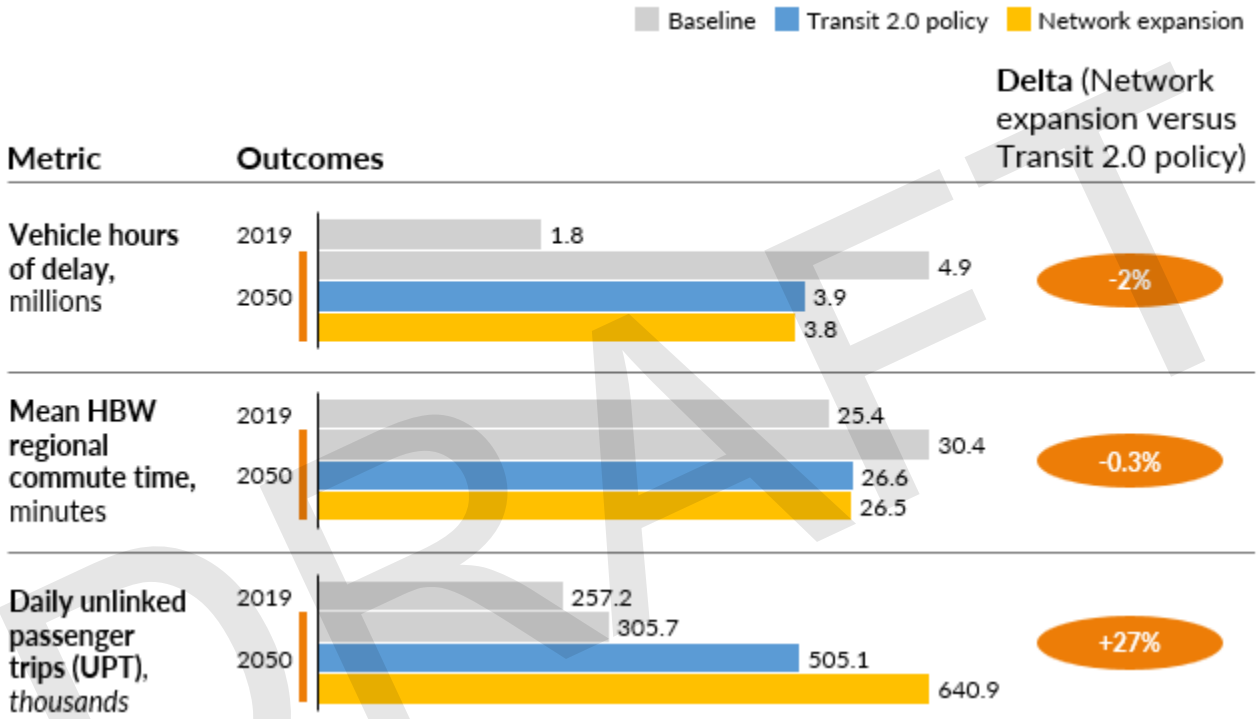


Figure 9: Operational impacts of network expansion scenario

- **Vehicle Hours of Delay:** The network expansion scenario represents only a 2% decrease in vehicle hours of delay.
- **Commute Times:** The network expansion scenario enables only a slight (i.e., <1%) decrease in average HBW commute times, from 26.6 minutes in the Transit 2.0 policy scenario to 26.5 minutes in the network expansion scenario.

The proposed expansions would come at significant capital costs of $14.6B in addition to the increased operating expenses associated with the new service lines. Therefore, the region will need to decide whether the benefit of this expansion is commensurate with the cost (i.e. in contrast to the lower costs and higher impacts observed in the Transit 2.0 policy scenario).

While wholesale transit expansion of the transit system network, as modelled in this scenario, showed limited impact compared to adoption of Transit 2.0 policy, **some expansions proved more effective.** For instance, extending the Green Line and Southwest TEXRail and Silver Line East interlining significantly boosted ridership, especially compared to other lines. Similarly, the Frisco Line and McKinney Line, though passing through suburban corridors, also performed well, as they serve growing population centers. The region could prioritize cost-effective expansions that maximize ridership gains.

Line	Additional ridership (versus Transit 2.0 policy scenario)	Capital cost ($M YOE)	Cost per added rider ($M YOE)
Green Line	9,207	606	0.07
Frisco Line	25,659	2,909	0.11
McKinney Line	10,974	1,817	0.17
Southwest TEXRail & Silver Line East	11,670	2,055	0.18
Midlothian	2,771	807	0.29
Line	2,760	1,211	0.44
Cleburne Line	4,032	2,371	0.59
Waxahachie Line	3,708	2,827	0.76

Section 4: The path forward

To effectively steward public dollars and meet future travel demand, the region could focus on implementation of Transit 2.0 policy initiatives, especially driving density-oriented economic development.

The Dallas–Fort Worth region is at an inflection point in which it must decide how to best address an expected population boom and the resulting increase in travel demand.

As demonstrated, **Transit 2.0 policy could be a promising path forward**. By concentrating housing, jobs, retail, and services within greater proximity to transit hubs, the region could create communities that foster transit usage and reduce dependence on private vehicles. Further, actions to improve transit competitiveness could increase ridership, particularly from choice riders.

These initiatives could drive significant uplift on regional outcomes, thus reducing congestion. The region would be better positioned to capitalize on the transit investments made in the past 40 years, driving value with existing infrastructure and limited incremental spend.

That said, Transit 2.0 alone may not fully address the increased travel demand by 2050, as traffic congestion is still expected to increase significantly even with adoption of these policies.

Therefore, the region could also consider strategic network expansion in combination with adoption of Transit 2.0 policy, along with density increases in new rail corridors. For example, if the regions were to prioritize expansion of only four rail lines, they could see significant increases in ridership at approximately half the capital cost. Standing up only the Green Line expansion, Frisco Line, McKinney Line, and Southwest TEXRail and Silver Line East would drive an approximately 11% increase in ridership versus the Transit 2.0 policy scenario, excluding any ridership increases on existing lines that may occur because of network system effects. Expansion of these four lines would require only $7.4B in capital expenditures.

By comparison, standing up all nine proposed lines drives an approximately 2 percentage point increase in ridership versus standing up the key four lines (from an 11% increase in ridership for the four key lines to a 13% increase in ridership for all nine lines), excluding any ridership increases on existing lines that may occur due to network system effects. However, this would require the region to invest a total of ~$14.6B in capital costs.

As such, when considering future transit system network expansion, the region will likely benefit most from a more selective approach, targeting rail lines in areas to the north with higher population density, as with the Frisco Line and McKinney line, or expanding upon existing high-traffic lines, as with the Green Line Extension and TEXRail and Silver Line extension.

To maximize the benefits of rail expansion, **TAs and regional cities could pair it with density-oriented economic development near the station areas and along the new rail corridors.** As the rail network grows, it could connect more residents and businesses to economic opportunities, reducing the reliance on single occupancy vehicles. The increased density of residential and commercial spaces near transit stations could help ensure consistent ridership, especially greater increases than modelled in the network expansion scenario.

Similar success can be seen in national and international examples of transit system improvements and expansion, which North Central Texas might consider as a model for its own. London's recently introduced Elizabeth Line – the city's fastest high-frequency, high-capacity railway, connecting London's outer suburbs to the heart of the city[19] – could be one example. Like the proposed rail expansions modelled in North Central Texas, expectations for the Elizabeth Line were modest. However, this line now represents 1 of every 7 national rail journeys in Britain. Driving the rail line's success, the London region continually invests in developing a competitive and attractive transit service, creating ridership gains that outpaced regional expectations. [20] North Central Texas could potentially see similar outcomes by adopting Transit 2.0 policy initiatives to strengthen existing and new transit infrastructure. Further, the Elizabeth Line paints a picture of the positive impacts of transit-oriented development, in which the region has developed a significant number of housing and employment opportunities around the stations and in the rail corridor. [21] North Central Texas could similarly leverage its existing and potential new rail assets to drive further, dense economic development in the region.

To bridge transit gaps and support potential network expansions, the region might also consider increased micro-transit usage (e.g., DART's Go-Link) to meet travel demand. Micro-transit, typically operated as an on-demand transit service offering served by smaller vehicles, could efficiently connect underserved areas – particularly those with low population density – to major transit hubs to enable smoother commutes and encourage use of the transit system. Further, data gleaned through operation of micro-transit about popular destinations and origins could inform TAs as to where they might benefit from adding new fixed-route services. By promoting shared rides, micro-transit may also help reduce congestion and single-occupancy vehicle use. Innovative P3 arrangements (e.g., putting together managed lanes with express bus service) could also be explored to expand the service and access with limited additional public funding.

North Central Texas does face increasing challenges as its population grows. However, Task 8 demonstrates that an improved transit system combined with density-oriented economic development could address some of these challenges. By enacting a joint approach – adopting Transit 2.0 policy actions and strategically expanding the transit system network – the region can

[19] Greater London Authority (2025)
[20] "A prize worth pursuing: has Elizabeth line shown what rail investment can achieve?" (The Guardian, 2025)
[21] "A prize worth pursuing: has Elizabeth line shown what rail investment can achieve?" (The Guardian, 2025)

leverage both existing and potential new assets to drive increased transit ridership, reducing regional congestion, and to encourage further economic growth of the region.

Appendix

Complete description of the modelled scenarios

Scenario	Competitiveness of the existing transit network	Network expansion	Service areas
Baseline	**Modest improvements in service** in line with existing TA strategic planning	**No network expansion** besides ongoing Silver Line projects SGR projects based on DART plans and peer benchmarks	**No new member cities**
Transit 2.0 policy	**Greater transit competitiveness driven** through frequency, reliability, customer experience, and pro-density growth, in line with policy recommendations from Tasks 2-7	**No network expansion** besides ongoing Silver Line projects **Minimal additional capital investment** to support Transit 2.0 fleet capacity and SOGR	**No new member cities**
Network expansion	**Greater transit competitiveness** driven through frequency, reliability, customer experience, and pro-density growth, in line with policy recommendations from Tasks 2-7	**Most network expansion projects scheduled in 2050 MTP and in TA plans** including all bus projects (~$410M) and most rail projects (~$15B)	**Potential new member cities** based on further impact and feasibility analysis of Task 3 recommendations

Transit 2.0 policy impacts simulated in the financial model

Scenario	Population density	Competitive transit travel times	Transit attractiveness	Financial performance
Baseline	**No change** (i.e., match existing baseline assumptions)	**No change** (i.e., match existing baseline assumptions)	**No change** (i.e., match existing baseline assumptions)	**No change** (i.e., match existing baseline assumptions)
Transit 2.0 policy **Network expansion**	TAs to **hire land use strategy teams** and **set aside cash to offer financial incentives to developers**, increasing CapEx/ OpEx *Impact on fare revenues via ridership simulated in TDM*	**Decrease headways to be in line with top peers**, increasing OpEx with potential increase in expansion CapEx and SOGR CapEx **Build dedicated RoW, transit signal priority (TSP) and decrease bus travel times by 25% on existing routes**, increasing CapEx and reducing OpEx *Impact on fare revenues via ridership simulated in TDM*	**Implement attractiveness initiatives** (e.g., tap-to-pay infra-structure, increased security personnel), increasing OpEx *Impact on fare revenues via ridership simulated in TDM*	**Apply additional OpEx and CapEx efficiency levers and establish new revenue sources based on Transit 2.0,** increasing revenues and decreasing OpEx and CapEx

Transit 2.0 policy impacts simulated in the Travel Demand Model (TDM)

Scenario	Population density	Competitive transit travel times	Transit attractiveness	Financial performance
Baseline	**No change** (i.e., match existing baseline assumptions)	**No change** (i.e., match existing baseline assumptions)	**No change** (i.e., match existing baseline assumptions)	*Impacts evaluated in the Task 8 financial model only*
Transit 2.0 policy	**Significant increase in population and employment around existing rail network by 2050**	**Transit modes are meaningfully more competitive on end-to-end travel time** versus car travel	**Positive customer attitudes/perception towards transit** based on improved safety, security, cleanliness, customer experience	*Impacts evaluated in the Task 8 financial model only*
Network expansion				

Transit 2.0 network impacts simulated in the financial model

Scenario	New rail and bus lines	Micro-transit	TA membership
Baseline	**No expansion CapEx** besides ongoing Silver Line projects (i.e., 'no transit build' network[22])	**No change** (i.e., match existing baseline assumptions)	**No change** (i.e., match existing baseline assumptions)
Transit 2.0 policy			

[22] Equivalent to the 2026 transit conformity network in the MTP transit projects excel shared by NCTCOG

Network expansion	**Expand network to meet regional vision** (i.e., most proposed projects) driving ~$15B expansion CapEx **Maintain new fleet**, increasing SOGR CapEx **Provide service to new lines**, increasing OpEx	**Modest expansion in micro-transit**, increasing OpEx	**Potential for 1% sales tax contribution** from 1-2 new member cities to be served by expanded regional rail network

Transit 2.0 network impacts simulated in the Travel Demand Model (TDM)

Scenario	New rail and bus lines	Micro-transit	TA membership
Baseline	**No new rail or bus lines** besides ongoing Silver Line projects (i.e., 'no transit build' network)	**No change** (i.e., match existing TDM baseline assumptions)	*Impacts evaluated in the Task 8 financial model only*
Transit 2.0 policy	**No new rail or bus lines** besides ongoing Silver Line projects (i.e., 'no transit build' network) *Potential fleet expansions to meet increased service levels to be evaluated in financial model*		

Network expansion	**Fully expand the network** in line with regional vision from MTP (i.e., network includes most of proposed MTP and TA capital expansion projects, ~$15B total CapEx)	*No expansion of micro-transit modelled*	

Details of Transit 2.0 policy scenario modelling

Density-oriented economic development: In the Travel Demand Model for Transit 2.0 policy scenario, density-oriented economic development was illustratively represented as increased population density around urban and suburban rail stations in TA member cities. These catchments were modelled to match the average density of the top-quartile densest catchments in their segments. As a result, in this illustrative scenario, member cities' population density rose from the current average ~3.1k persons per square mile to ~4.1k persons per square mile, aligning with the current population density of Addison and Richardson, Texas. This illustrative increase in population density could still represent economic development the region is familiar with, including single-family homes, as depicted in current day Addison, Texas, shown below.

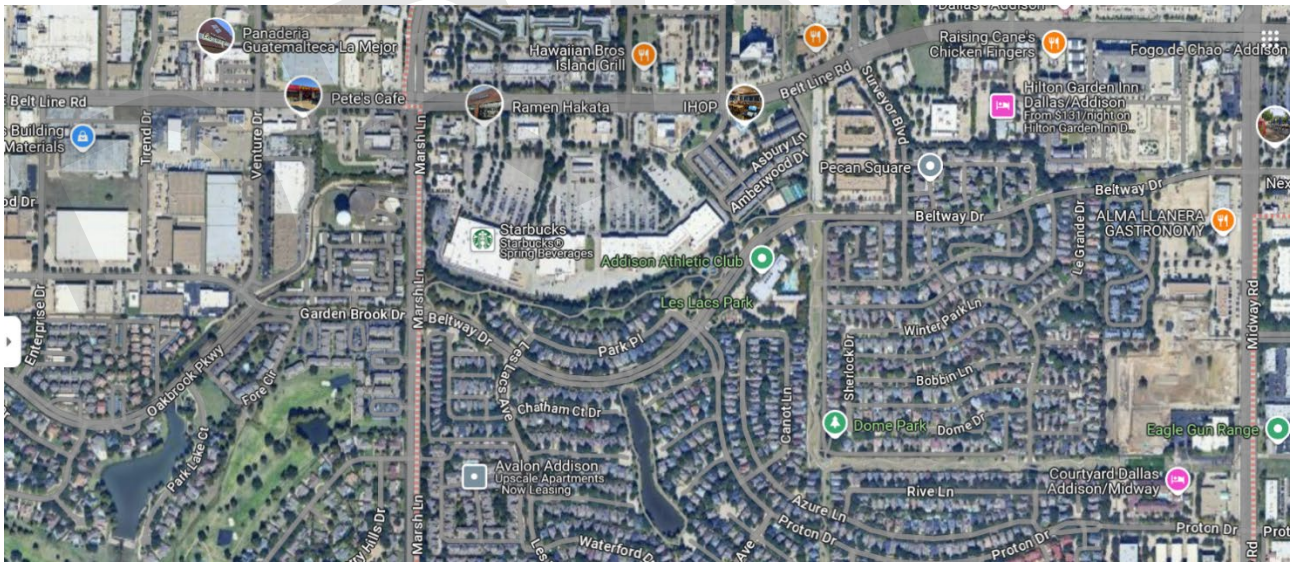


Figure 10: Residential neighborhood in Addison, Texas[23]

[23] Google Maps (2025)

Transit competitiveness: Transit 2.0 policy vision and financial modelling approach overview

Transit 2.0 policy vision	Tactical implementation (for TAs only)	Modelled impacts
Frequency in line with top peers: 10-15-minute peak frequencies on bus routes; Nonpeak bus frequencies limited to 20 minutes across the network 5-minute peak, 15-minute off-peak for all regional rail and light rail lines	**TAs increase bus and rail service on existing lines** to meet new frequency standards Acquisition of bus and rail vehicles needed	**207 new buses and rail vehicles needed above current number of vehicles operated at maximum service (VOMS) – >$600M onetime CapEx** **$4B additional OpEx to operate higher levels of service**, assuming a constant relationship between changes in VRH and OpEx
Faster bus travel speeds based on dedicated RoW and TSP initiatives **Average bus travel speed increase of ~25% across the network**, from expected impact of dedicated RoW and TSP initiatives; based on peers who implemented similar initiatives No increase assumed for rail travel speed	**Development of dedicated RoW on high-potential bus corridors**	**$40-80M estimated onetime CapEx** for building infrastructure related to dedicated bus right of way **$1-2M estimated onetime CapEx** calculated for implementing TSP at ~100 high-demand intersections

Transit attractiveness: Transit 2.0 policy vision and financial modelling approach overview

Transit 2.0 policy vision	**Tactical implementation (for TAs only)**	**Drivers impacted**	**Illustrative investments,** based on Transit 2.0 recommendations
Safest public transit network in the country (i.e., driven by coordinated safety/security efforts across the region) based on peer benchmarks **Facility and vehicle cleanliness** on par with best-in-class global peers **User experience in line with global peers** (e.g., improved wayfinding, real-time data display at transit hubs, mobile application, alerts) **Seamless payments integrated across TAs** **Riders are likely to recommend DART, DCTA or Trinity to a friend** (i.e., NPS of ~+30 in line with top global peers)	TAs invest in initiatives to increase perceived and actual **safety and security**	OpEx	Public safety personnel Station infrastructure (e.g., call boxes, light fixtures at dark bus stops, rail platform doors) that enhance safety
	TAs invest in initiatives to improve **cleanliness at stations and on transit**	OpEx	Janitorial personnel Enhanced sanitation procedures (e.g., clean end of line 2x/month rather than 1x/month)
	TAs invest in initiatives to enhance **rider experience**	OpEx	Real-time data displays Seamless payment infrastructure (e.g., tap to pay) Mobile applications/alerts
	TAs improve **marketing, branding, and communications**	OpEx	New marketing campaigns Community outreach events (e.g., customer giveaways)

CapEx investments in transit attractiveness were not simulated in the financial model, as expected impact is minimal.

Efficient transit performance: There were four levers modelled in the Transit 2.0 policy scenario to help the region save a potential ~$1.0B through collaborative efficiencies. These values are preliminary and illustrative estimate – with further effort required to refine potential impacts:

1. **Region wide-consolidated demand response options:** The model assumes that all outsourced demand transits become as efficient as the most cost-effective contract on a cost-per-ride basis, saving a cumulative ~$560-690M by 2050.

2. **Region-wide consolidated end-to-end (E2E) payment systems**: The model assumes that the efficiency gains from regional integration could be reinvested to streamline payment processes, though this would not generate savings.

3. **Leveraging private sector operators:** From a financial perspective, the model does not assume that TAs leverage private sector operators. However, TAs could leverage private sector innovation to help transit operations (e.g., TRE) increase efficiency in line with top peer benchmarks. This could also allow TAs to focus on more strategic priorities and initiatives, rather than day-to-day operations.

4. **Collaborative procurement practices across TAs:** The model assumes savings of $300-360M by 2050 driven by TAs enacting collaborative procurement processes for key addressable spend categories (e.g., new rolling stock, ties, rail, repair parts for rolling stock, etc.)

5. **Consolidated commuter rail responsibilities:** The model assumes that the region's three TAs achieve 10% operational synergies across SG&A, maintenance talent, and facilities, saving a cumulative $80-100M by 2050.

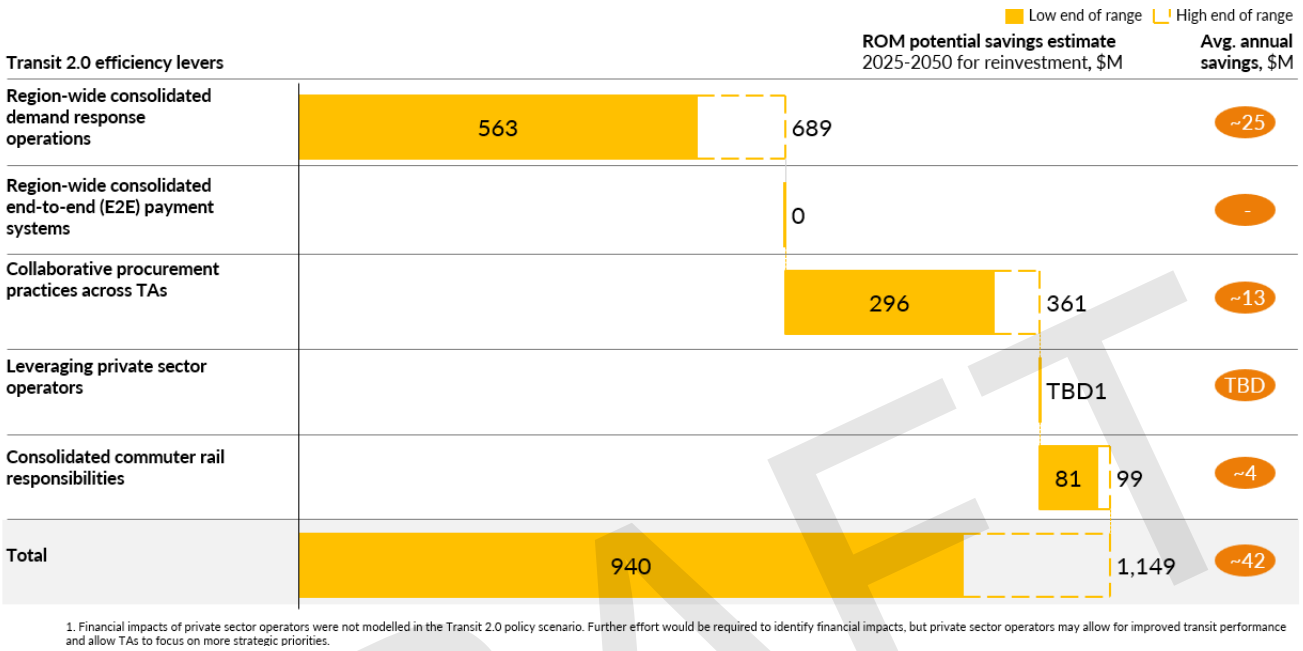


Figure 11: Rough Order of Magnitude (ROM) potential savings for Transit 2.0 efficiency levers

Ridership gains in the Transit 2.0 policy scenario

Line	Ridership gains (versus baseline)	% of baseline ridership
Green Line	25,858	16.7%
Red Line	15,496	10.0%
Blue Line	15,135	9.8%
Orange Line	14,605	9.5%

TExRail Line and Silver Line combined	12,007	7.8%
Trinity Railway Express	7,240	4.7%
DCTA A Train	2,550	1.7%
McKinney Trolley	2,191	1.4%
Las Colinas APM	616	0.4%

Modelled rail line network expansions

Line	From	To	Miles
Frisco Line	South Irving Transit Center	City of Celina	37
Waxahachie Line	Downtown Dallas	City of Waxahachie	31
Cleburne Line	Fort Worth Central Station	Cleburne Intermodal Transport Depot	30
Midlothian Line	Westmoreland	Midlothian Central	18
McKinney Line	Parker Road Station (Plano)	McKinney North	18
Scyene Line	Lawnview	Lawson Road	12
TEXRail and Silver Line interlining (extension)	Fort Worth T&P Shiloh	McPherson Wylie	9

Green Line (extension)	Buckner Boulevard	South Belt Line Road	6