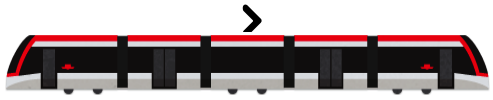
CodeRedTO



Mixed Signals

Toronto Transit in a North American Context

Fares Networks Budgets Governance

2018

About CodeRedTO

CodeRedTO is a consciously non-partisan, volunteer-run, local and regional transit advocate. We promote more and better transit options for more residents; using all available technologies where appropriate; creating better information for better decision-making; completion of efficient and approved plans; and support increased, predictable funding for public transit expansion and operation.

CodeRedTO is funded through personal donations and grants from non-profit agencies and foundations, and directed by an advisory board with no financial interest in any transportation projects or agencies.

CodeRedTO was founded in 2011.

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CodeRedTO

Report Authors & Contributors

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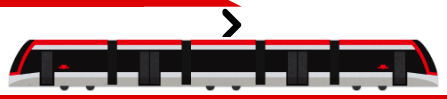
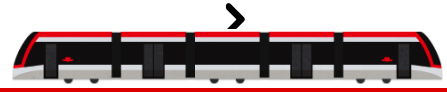
Benjamin Wert works in arts administration, and has a keen interest in municipal affairs. His favourite transit experiences include riding every L line in Chicago from end to end, going across Toronto's Price Edward Viaduct at twilight, and using the Roosevelt Island tramway.

Acknowledgements

This report would not exist without the efforts of dedicated TTC, City of Toronto, and Metrolinx employees, and transit-involved teams across North America bringing safe and reliable public transit to residents each day, under (as this report shows) significantly challenging variations in funding, network resilience, and governmental accountability.





Executive Summary

This report compares Toronto to similar local and commuter rail transit systems in several cities in Canada and the United States, examining specifics of fares, funding, network coverage, and governance. The goal of the comparisons is to see what Toronto is doing well and how it could do better.

Transit networks are highly complex and dynamic systems. While there is no perfect or universal model, there is always something to learn from how other cities build and manage transit. This report finds that Toronto is lagging behind other comparator cities in key ways, while outperforming in others. Any changes to Toronto's regional transit network structures must be considered on the basis of both transparency and local accountability.

Transit systems in Asia and Europe have impressive achievements, but they emerge from different political and geographical environments. Similarly, New York City's subway comes from an entirely different time period and starting point. Comparing Toronto's transit with other systems in Canada and the United States shows us what is realistic in the North American context.

Given our unique and vulnerable position in terms of funding structures, network design, and expansion choices, this report finds specific investment goals desirable to protect the future of public transit in Toronto. ■

Toronto has...

- 2nd-Highest public transit ridership level in NA
- 2nd-Highest public transit commuter mode share in NA
- Strong suburban coverage and service levels

Toronto needs...

- An improved funding model to address low subsidy level and lack of dedicated revenue streams
- A less-politicized, more resilient governance structure
- More complexity in its rapid transit network
- Less reliance on tunneled infrastructure in the current limited funding environment
- A more accessible monthly pass

CodeRedTO recommends these immediate investments:

- Add new, predictable, sustainable revenue
- Add prioritized surface transit lanes on both inner core and suburban avenues
- Reduce overall cost and early commitment requirements for monthly passes

CodeRedTO recommends these longer-term goals:

- Create new city-centred but regionally-collaborative governance structures
- Implement regional fare integration which builds on the city's successful no-zone flat fare structure
- Implement regional network integration only where it can build increased ridership and mode share

Comparator City Selection

Regardless of criteria, any selection of cities will have faults and negative effects on the comparison itself. In this report, an attempt was made to provide a reasonable breadth of comparisons across city and urban area populations, transit network complexity and modes, and relevance to Toronto.

While a comparison to New York City's iconic and extensive subway system is seemingly unavoidable in Toronto media and at City Council, it is inappropriate for this report. This area has an urban area population of over three times that of the GTA, and a heavy rail network which is multiple decades older.

By contrast, Calgary's network consists of a single transit mode, and features no regional commuter rail nor a modern fare card.

Cities such as Philadelphia, San Diego, and Dallas have relevant network structures for the curious transit policy researcher, but were not included in this report.

	City Pop.	Urban Area	Heavy Rail	Rail in Exclusive ROW	Rail in Non-Exclusive ROW	Regional Rail Service	Multi-Mode and Multi-Line	Fare Card System	Rail, Bus, Parking, and…
New York City MTA	8.6m	20.3m	■	■	□	■	□	■	
Los Angeles Metro	4.1m	13.3m	■	■	■	■	■	■	
Toronto TTC	2.8m	7.2m	■	■	■	■	■	■	
Chicago CTA	2.7m	9.5m	■	■	□	■	□	■	
Houston Metro	2.2m	6.8m	□	■	■	□	□	■	
Montreal STM	1.8m	4.1m	■	■	□	■	□	■	**On-call / Taxibus**
Philadelphia SEPTA	1.6m	6.1m	■	■	□	■	■	■	
San Diego MTS	1.4m	3.1m	□	■	■	■	□	■	
Dallas DART	1.3m	7.4m	□	■	■	■	■	□	**On-call / Taxibus**
Calgary Transit	1.2m	1.4m	□	■	■	□	□	□	
Washington DC Metro	0.7m	6.1m	■	■	■	■	■	■	
Boston MBTA	0.7m	4.7m	■	■	■	■	■	■	**Ferries**
Vancouver Translink	0.6m	2.5m	□	■	□	■	■	■	**Ferries**

Fare Structures

There is no perfect or universal structure for public transit fares. Costs, passes, structures, and even whether to charge at all vary widely around the world, but within North America we find similar fares, structures, and a remarkable continent-wide conclusion that public transit agencies shall charge for their service.

The mobility options provided to residents are part of a city's democratic practice. As we examine the costs to riders, we should be thinking about how to more efficiently provide more service, to more residents, and recognize the diversity of needs and payment capacity. It is also key to create a sustainable model to ensure long-term mobility within our cities. ■

Commonalities

- TTC fares have risen far above the rate of inflation over the last twenty years
- A single fare zone for the core urban area, often across multiple modes
- No fare capping option for the core urban transit system
- Little regional fare integration

Differences

- TTC the only agency examined with an annual pass option, disproportionately benefiting higher-income riders
- TTC the only agency examined required to cover over two-thirds of its operating expenses from the farebox

Our report found Toronto's transit fares and goals contrast with other cities in key ways.

Toronto's principal transportation provider, the TTC, has broadly-typical public transit fares, with a cash fare of $3.25 Canadian, close to or matching Montreal, Boston, Chicago, and comparable to both Vancouver and Washington, D.C.

All comparator city fares sit within the $1.60-$3.25 CAD range for the single zone or the core zone, and up to around $7.80 CAD at peak for the distance-based and zone-based systems. The regional commuter rail systems typically have separate fare systems, rarely integrated with the core local agency, with exclusively distance-based fares.

Toronto's daily and weekly pass cost levels approach the median among the cities reviewed. But what sets it apart are its **continentally-unique annual adult Metropass**, and a significantly more costly monthly pass. All passes perform a some-what contradictory role for transit riders, as they are designed to provide a discount for higher-volume use, but are usually only available to those with sufficient disposable income to pre-pay for the pass in expectation of benefiting later.

One technology tool available with electronic fare cards is fare capping, which automatically reduces or eliminates the incremental cost to the rider once a certain threshold has been reached. GO Transit provides this in lieu of monthly passes, via the PRESTO card also being adopted by the TTC. However, fare capping remains rare even as electronic fare cards proliferate, due to perceived fare revenue risk. Some systems "split the difference," such as Houston Metro's requirement of a custom card in order to gain access to capping.

Common to nearly all the reviewed cities is a single flat fare, an international best practice for transit access which provides dramatically different travel distances for the same fare. In an urban area with expensive core housing, this can be a form of travel subsidy from short-trip riders to long-trip riders.

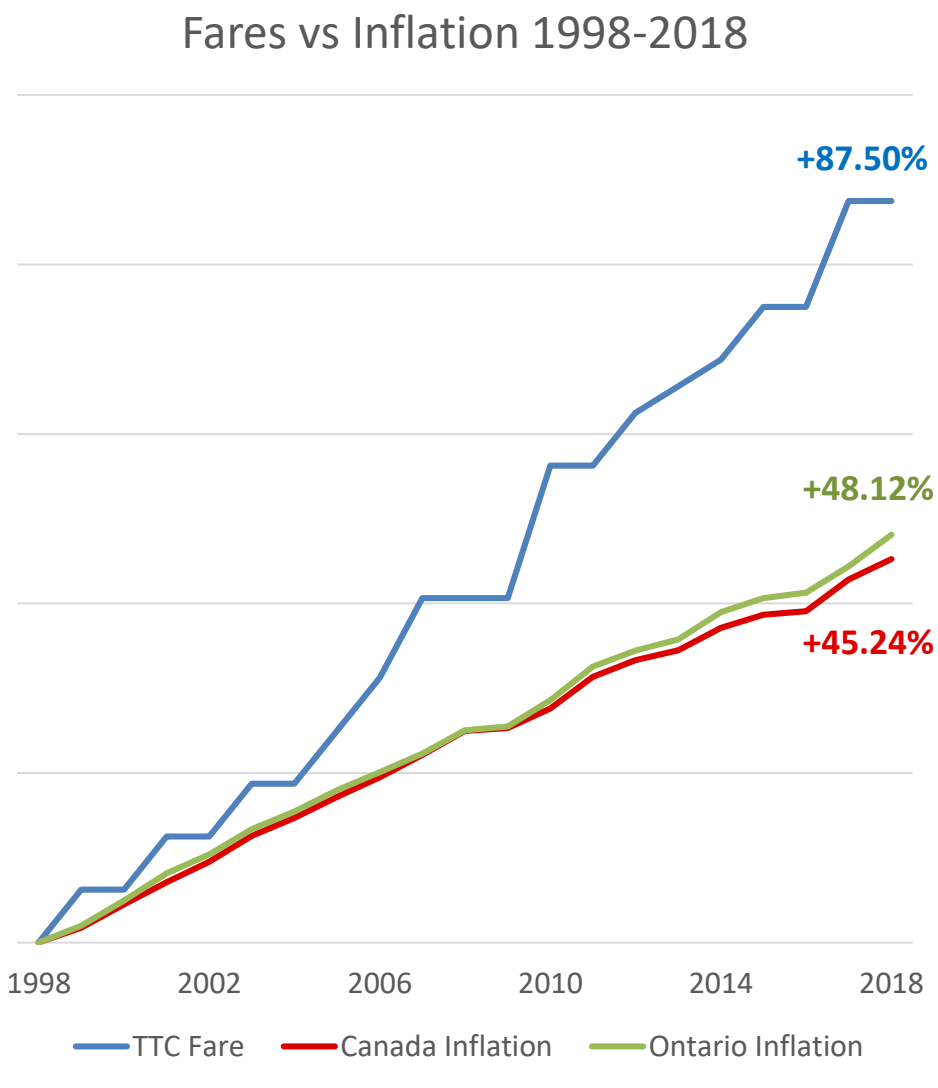
A remarkable commonality across nearly every city studied is the magnitude of fare increases: in every city outside Los Angeles, transit fares rose faster than inflation over the last twenty years, sometimes dramatically. **The TTC's adult cash fare rose 29% faster than inflation from 1998-2018.**

The most alarming discovery in CodeRedTO's research has been that while all public transit agencies worldwide contribute to operating expenses via the farebox, **the TTC relies on fares for two-thirds of its base operating budget, a level not seen in any other city in North America.**

When combined with inadequate and insecure funding, the vulnerability of the TTC is particularly acute.

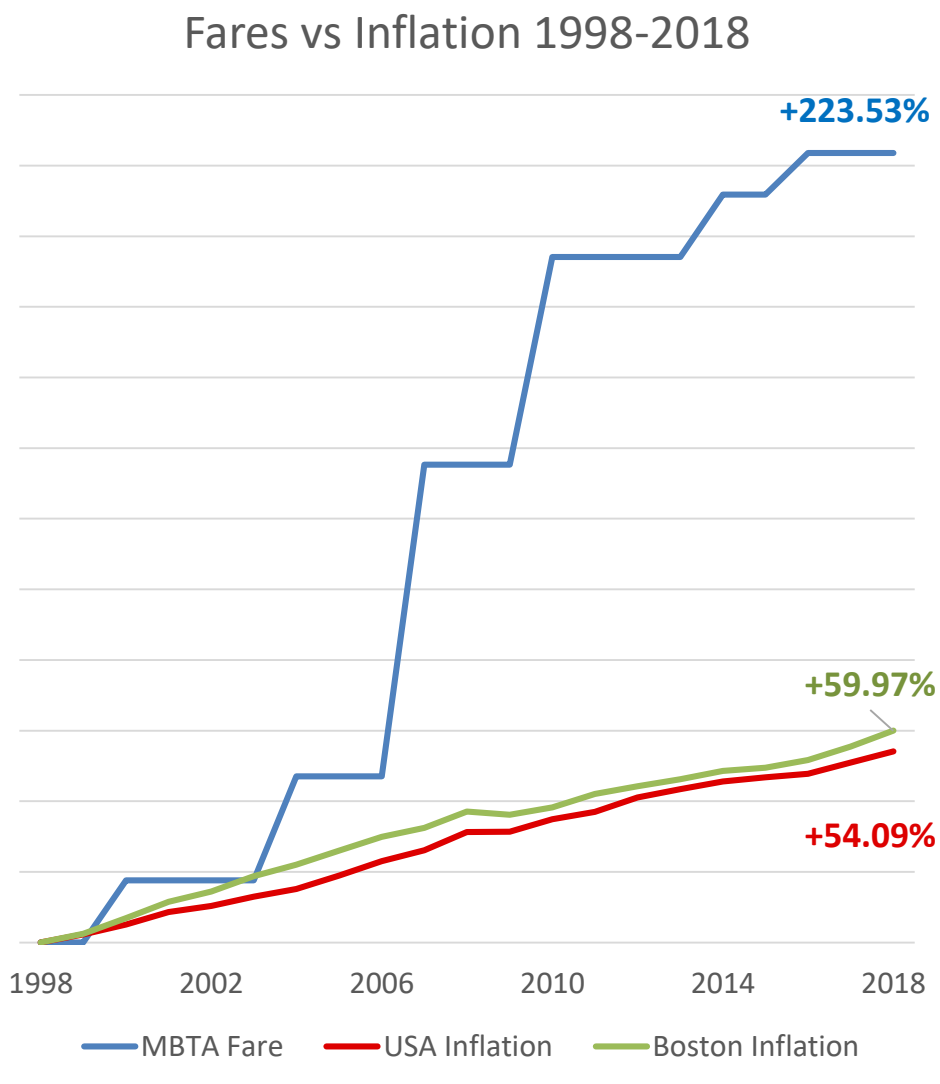
Toronto (TTC)

PRESTO	$3.25 cash $3.00 fare card / token
Transfer Rules	Free transfers up to two hours in any direction with fare card.
Fare Zones	Single zone, single fare
Separate Regional Fares	GO commuter rail Zone fares $4.77-$18.50, monthly cap
Daily Pass	$12.50 (3.85x cash fare)
Weekly Pass	$43.75 (13.5x cash fare)
Monthly Pass	$146.25 (45x cash fare)
Annual Pass	$1,608.00 (41.23x cash fare, monthly)
20-year Fare Δ	+87.50% ($1.75 cash in 1998)



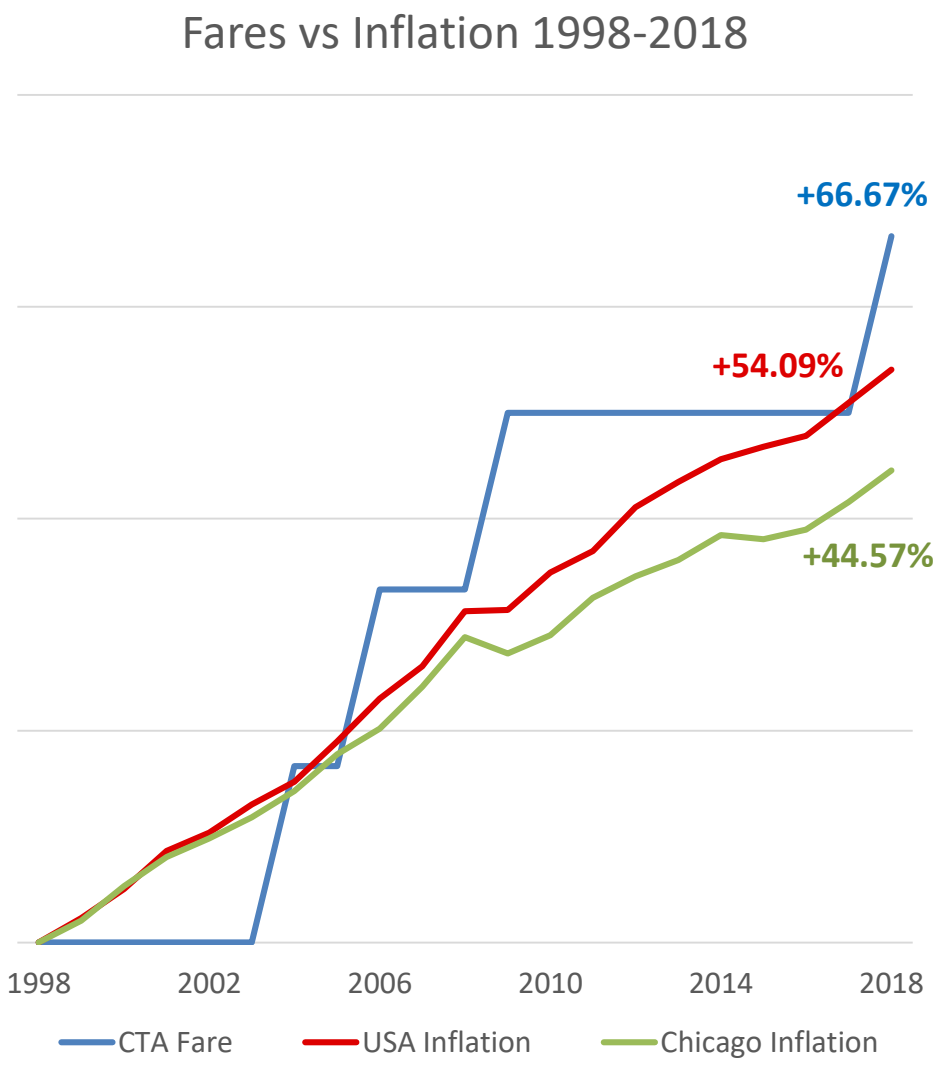
Boston (MBTA)

	$2.75 cash $2.25 fare card
Transfer Rules	Rail to rail: free First transfer to other modes: discounted within first two hours only
Fare Zones	Single zone, fare varies by mode
Separate Regional Fares	MBTA Commuter Rail Zone fares $2.25-$12.50
Daily Pass	$12.00 (4.4x cash fare)
Weekly Pass	$21.25 (7.7x cash fare)
Monthly Pass	$84.50 (30.7x cash fare)
Annual Pass	n/a
20-year Fare Δ	+223.53% ($0.85 cash in 1998)



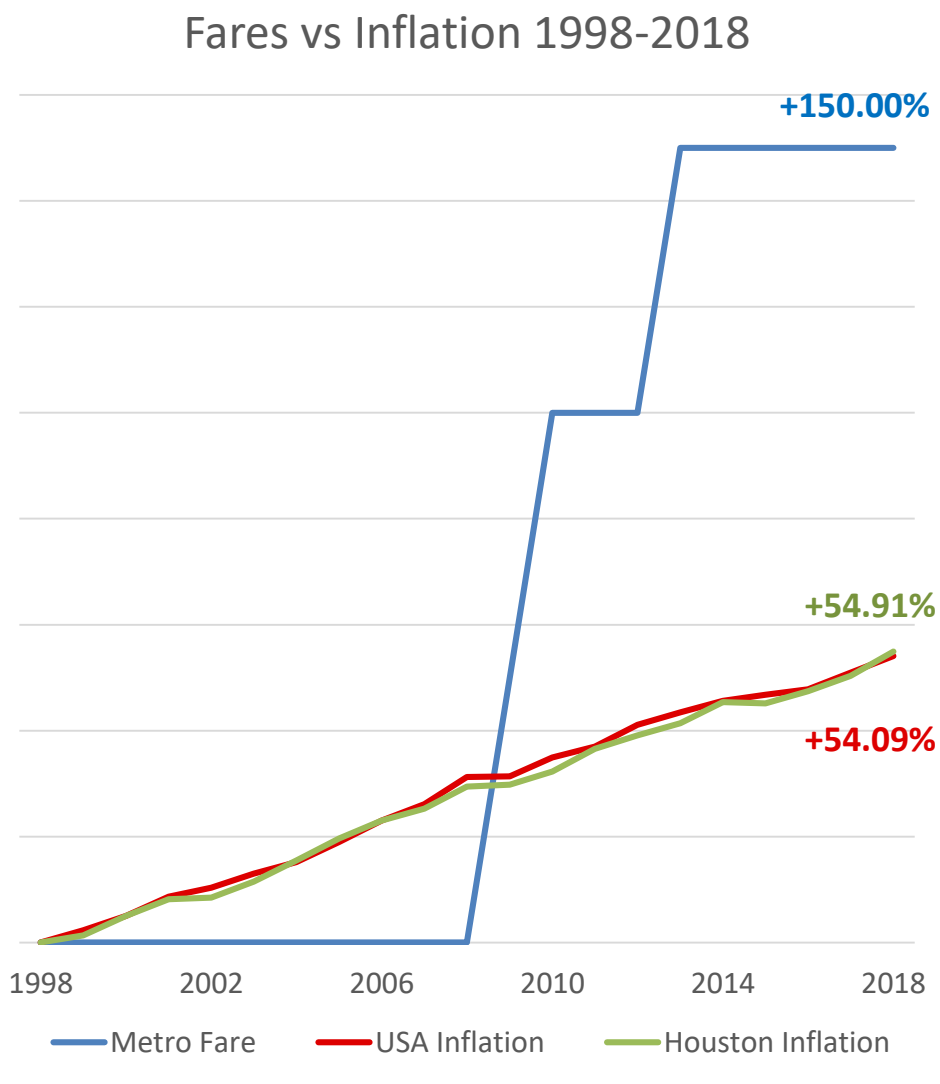
Chicago (CTA)

	$3.00 cash $2.50 fare card
Transfer Rules	$0.25 for train or up to $0.30 for bus, for up to 2 additional rides within 2 hours. Only available using fare card.
Fare Zones	Single zone, fare varies by mode. Airport service +$5.00
Separate Regional Fares	Metra Commuter Rail Zone fares, $4-$8.25
Daily Pass	$10.00 (3.3x cash fare)
Weekly Pass	$33.00 (11x cash fare)
Monthly Pass	$105.00 (35x cash fare)
Annual Pass	n/a
20-year Fare Δ	+66.67% ($1.50 cash in 1998)

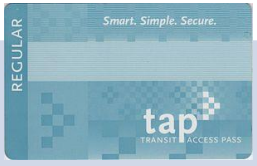


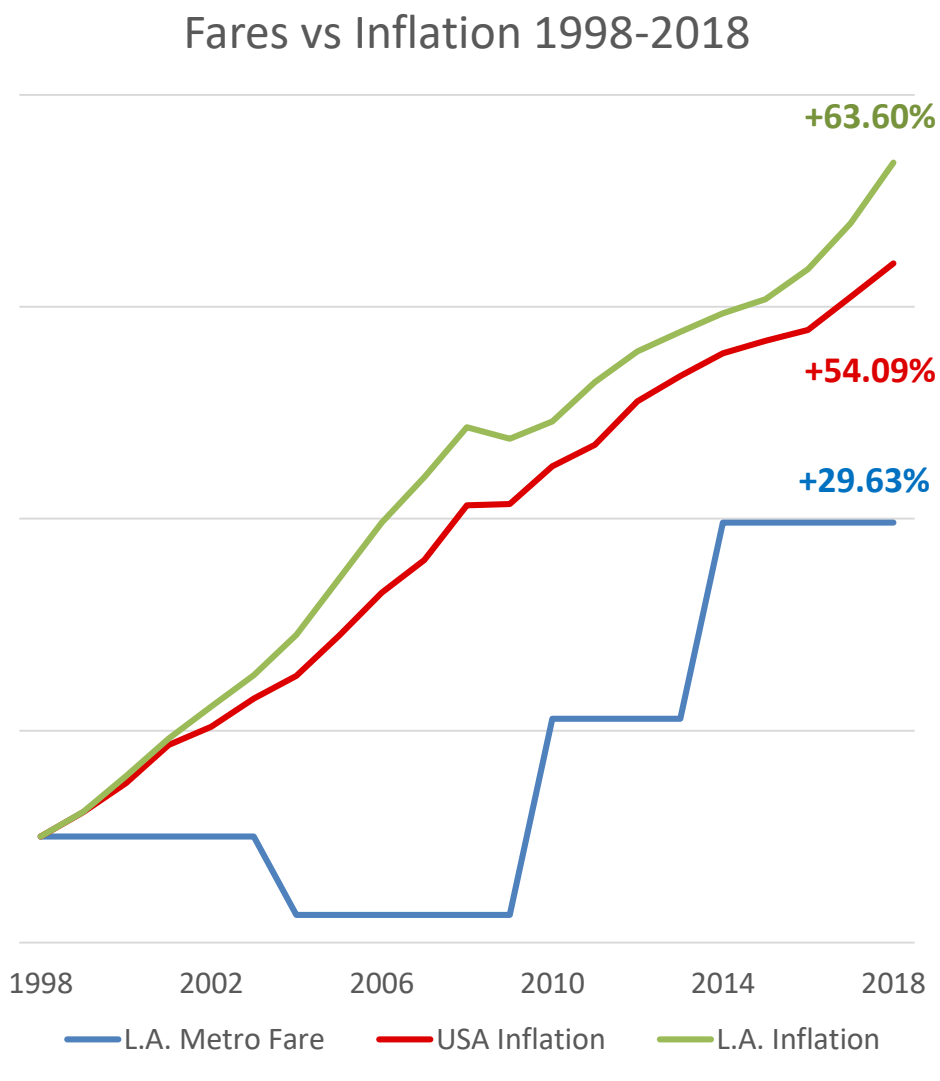
Houston (Metro)

	$1.25 cash or fare card
Transfer Rules	Free transfers up to three hours in any direction with fare card.
Fare Zones	Single zone, single fare
Separate Regional Fares	Express Park & Ride bus service Zone fares $2.00-$4.50
Daily Pass	$3.00 (2.4x cash fare)
Monthly Pass	n/a
Weekly Pass	n/a
Annual Pass	n/a
20-year Fare Δ	+150.00% ($0.50 cash in 1998)



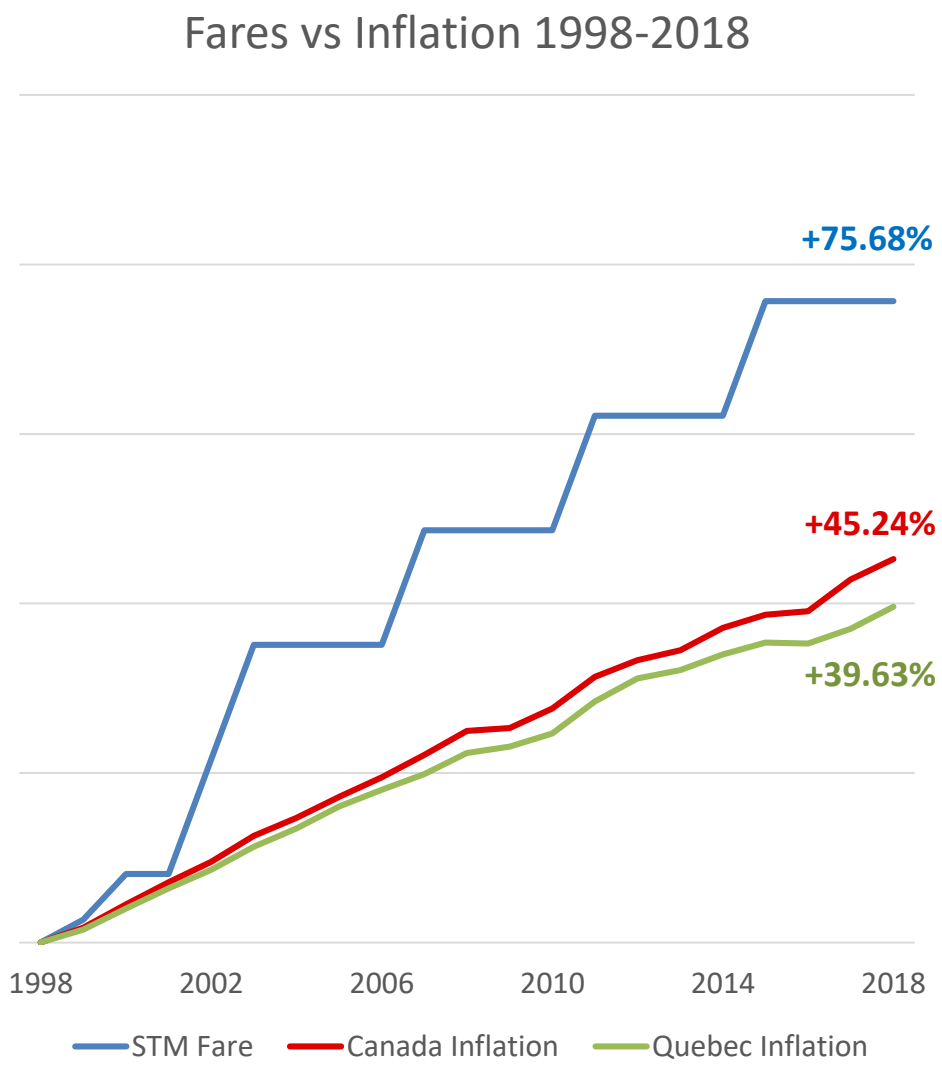
Los Angeles (Metro)

	$1.75 cash or fare card
Transfer Rules	$0.50 for transfer to a non-Metro bus within 2 hours
Fare Zones	Single zone, single fare
Separate Regional Fares	Metrolink Commuter Rail Zone fares $2.75-$27.50
Daily Pass	$7.00 (4x cash fare)
Weekly Pass	$25.00 (14.3x cash fare)
Monthly Pass	$100.00 (57.1x cash fare)
Annual Pass	n/a
20-year Fare Δ	+63.60% ($1.35 cash in 1998)



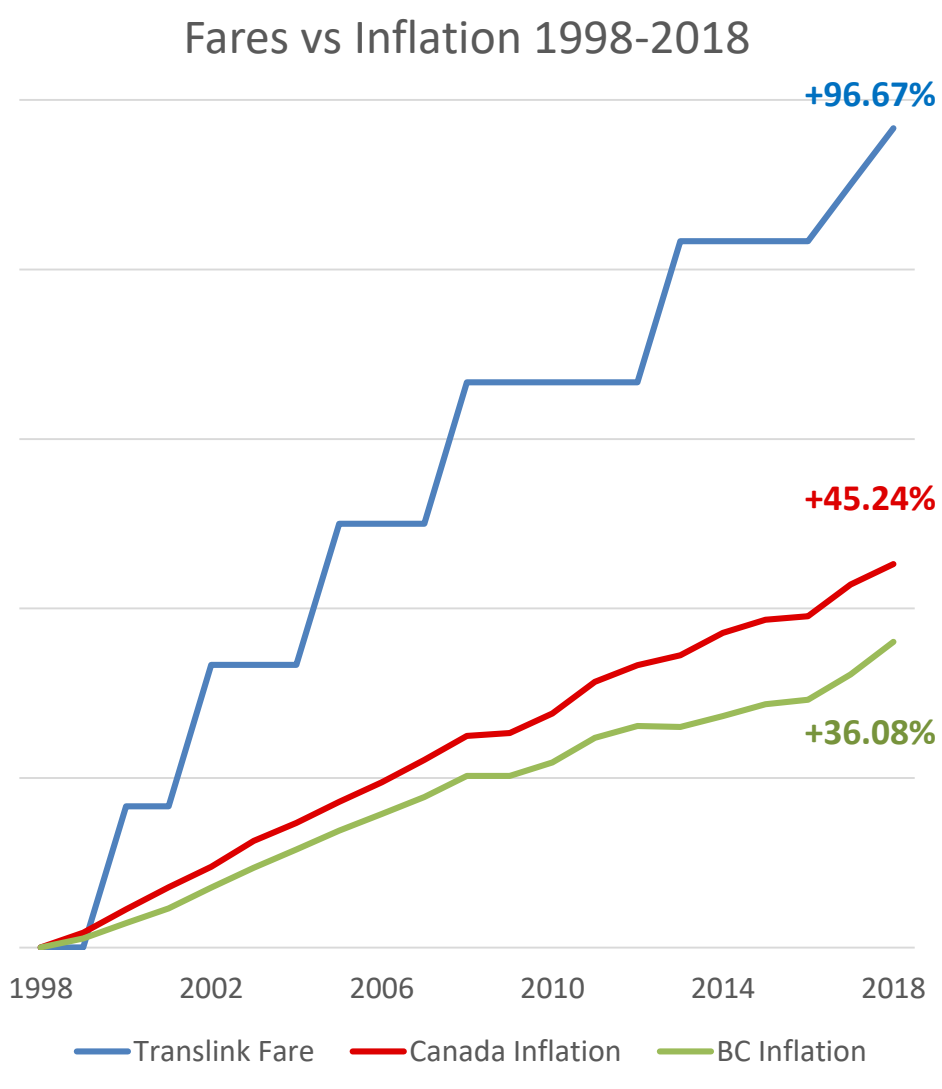
Montreal (STM)

	$3.25 cash or fare card
Transfer Rules	Single continuous trip (multi-vehicle)
Fare Zones	Single zone, single fare
Separate Regional Fares	EXO commuter bus and rail Zone fares $4.75-$9.75
Daily Pass	$10.00 (3.1x cash fare)
Weekly Pass	$26.25 (8.1x cash fare)
Monthly Pass	$85.00 (26.2x cash fare)
Annual Pass	n/a
20-year Fare Δ	+75.68% ($1.85 cash in 1998)



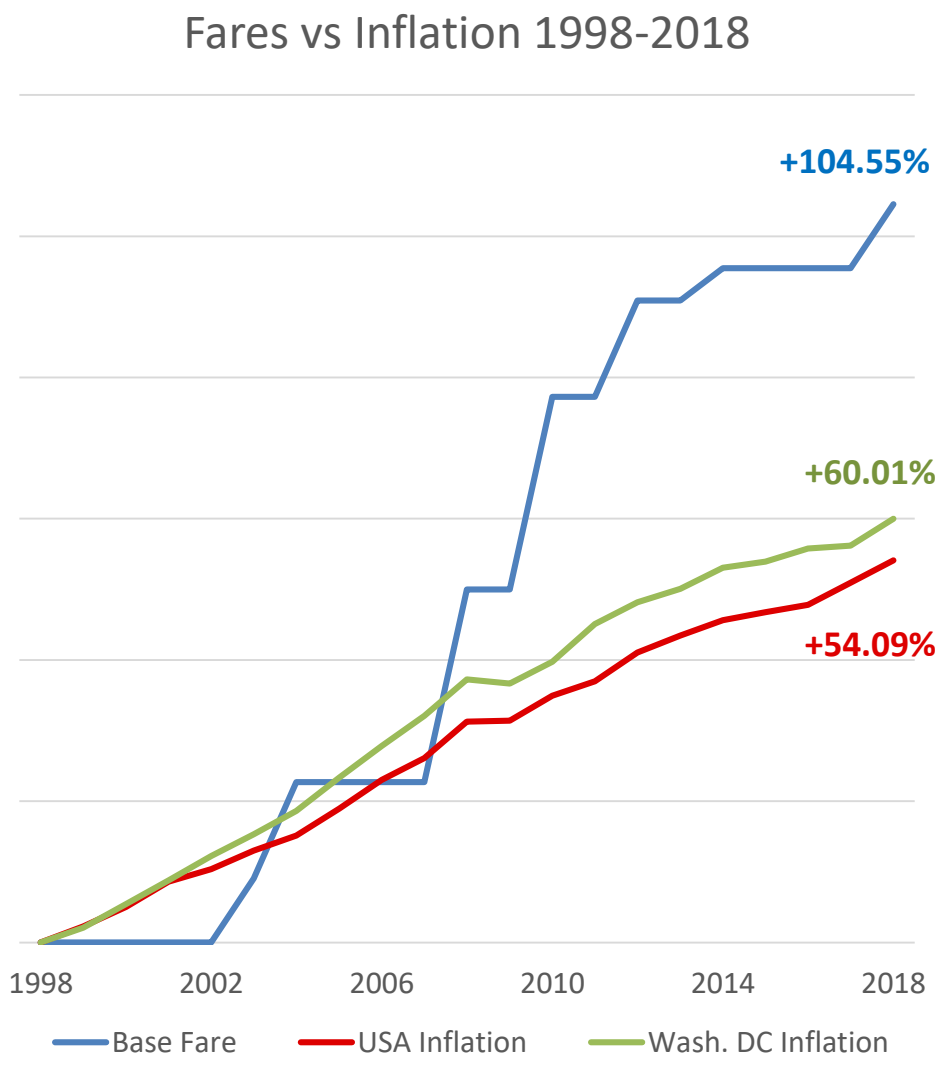
Vancouver (Translink)

	$2.95-$5.70 cash (3 zones) $2.30-$4.40 fare card
Transfer Rules	Free transfers for 90 minutes
Fare Zones	3 zones, airport exit +$5.00
Separate Regional Fares	West Coast Express Commuter Rail Zone fares $6.25-$12.45
Daily Pass	$10.25 (5.4x 1-zone cash fare)
Weekly Pass	n/a
Monthly Pass	$95.00 (32.2x 1-zone cash fare)
Annual Pass	n/a
20-year Fare Δ	+96.67% ($1.50 cash in 1998)

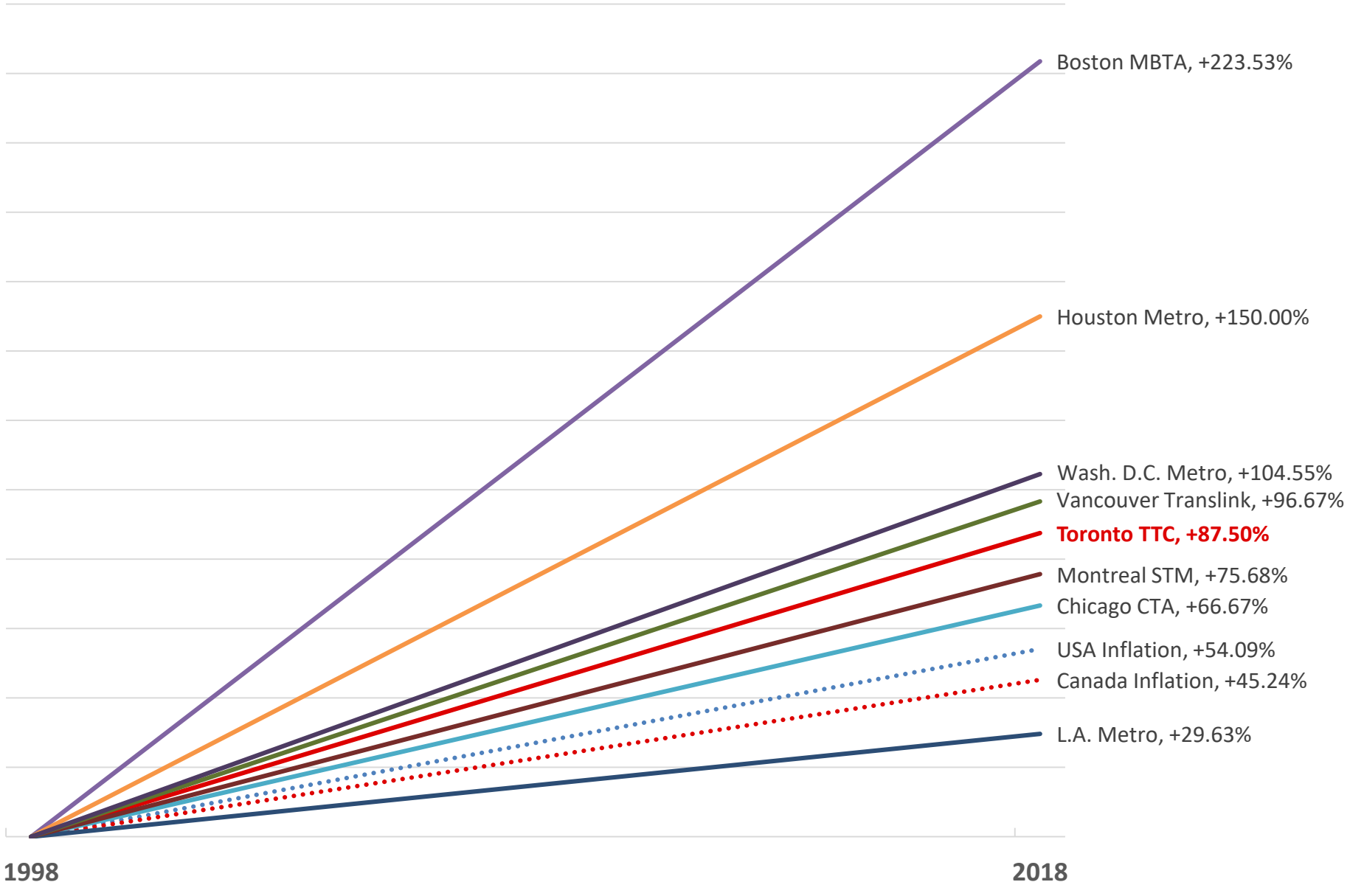


Washington, D.C. (WMATA)

SmarTrip	$2.25-$6.00 cash or fare card (distance-based, in peak hours)
Transfer Rules	Train: one single ride, no transfer Bus: free transfers up to two hours $0.50 discount if combining modes
Fare Zones	Combination of distance and zone
Separate Regional Fares	MARC and VRE Commuter Rail Zone fares $3.40-$13.00
Daily Pass	$14.75 (6.6x 1-zone cash fare)
Weekly Pass	$60.00 (26.7x 1-zone cash fare)
Monthly Pass	n/a
Annual Pass	n/a
20-year Fare Δ	+104.55% ($1.10 cash in 1998)

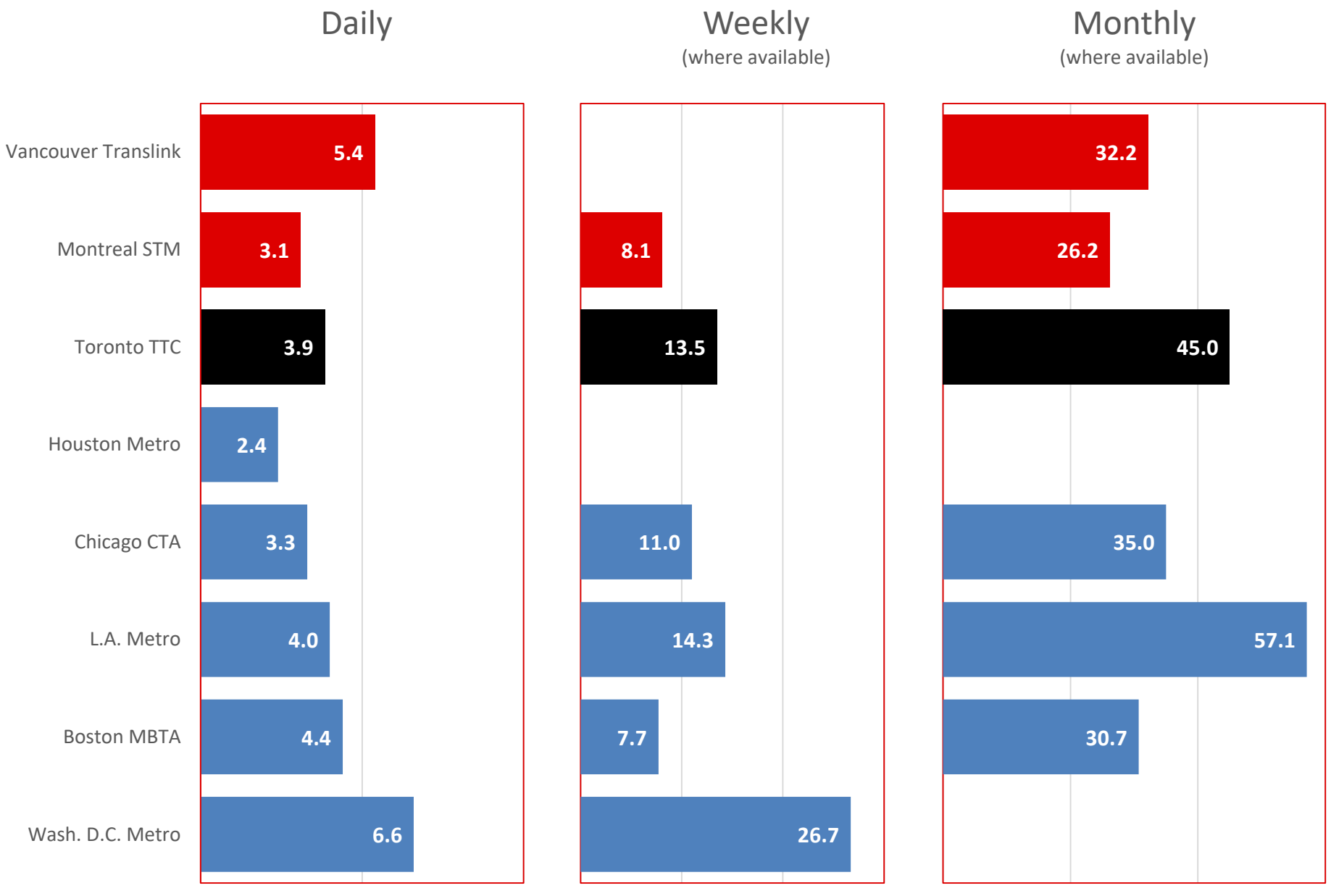


Base Cash Fare vs Inflation 1998-2018



Pass Multipliers

Number of Cash Fares to Match Pass Cost



Network Design

There is no perfect or universal structure for the public transit network. But there are commonalities among many cities, and lessons to be learned. Network mobility and resilience is a key factor in increased commuter mode share, and as we design our networks, we should be thinking about how to address unserved needs, how to create an adaptable travel grid, and how to benefit most from network effects. These are all essential characteristics of a strong transit network.

Political decisions affecting the efficiency of the network have ripple effects which impact riders across the network, changing commuter mode share, non-peak ridership decisions, and system revenue. ■

Commonalities

- Strong ridership and mode share similar to other Canadian cities
- Multi-decade history brings expansion goals into conflict with modern standards
- Nearly all cities have regional commuter rail in addition to urban core service

Differences

- 2nd-highest proportion of tunneled transit increases costs and construction time
- Lower number of lines reduces coverage and network benefits
- Choosing extensions over new lines means small issues create large interruptions

A strong transit network serves a diversity of destinations and a diversity of riders. There are many aspects to the development of a network with good connectivity. Simply put, the network must connect to places people want to go.

All cities in the study have multiple-mode local transit, and all offer regional rail except Houston. Every agency examined has responsibility for some private vehicle parking lots, alongside the expected bus and rail services, while a few add on-call services, ferries, and even bike share.

It is popular to contrast Toronto's subway network with New York, Paris, Chicago, or Boston, but Toronto started building its rail network decades later. Toronto's early investments have given Toronto a good foundation, but **it is disingenuous to contrast these cities without noting that the New York City subway was essentially complete before Toronto even started.**

Toronto's GO Train network provides wide regional coverage, and has built ridership exceeding most other cities, especially along its higher-capacity Lakeshore lines.

Toronto's local rail network is less complex, with less coverage than many cities. **Downtown core streetcar lines improve the network greatly, but at low resilience due to mixed-traffic street design.** When contrasted with every other city in the study, it is clear Toronto's heavy reliance on two very long rail lines is unusual. More complexity allows for greater network connectivity and adaptability. **The Eglinton Crosstown LRT line will strengthen Toronto's network considerably**.

Toronto's local transit has the highest ridership of all systems in the study. Unlike many other cities, the most common mode of transit is the bus, whose network connects well to the subway system. Indeed, Toronto's subway is only busy because of busy feeder buses, given low density near most stations.

It is notable that **some of the busiest public transit routes are found in suburban areas of Toronto** (such as along Finch Avenue). This demonstrates that it is possible to build strong transit ridership in areas with lower density that the city core.

Toronto also has the highest rate of transit use, as a proportion of commuters, of all metro areas in the study. This success is driven by transit use in and into Toronto. Local transit use in cities outside Toronto remains quite low. While it has a much lower ridership that Toronto local transit, suburban use of regional rail is strong along the lakeshore.

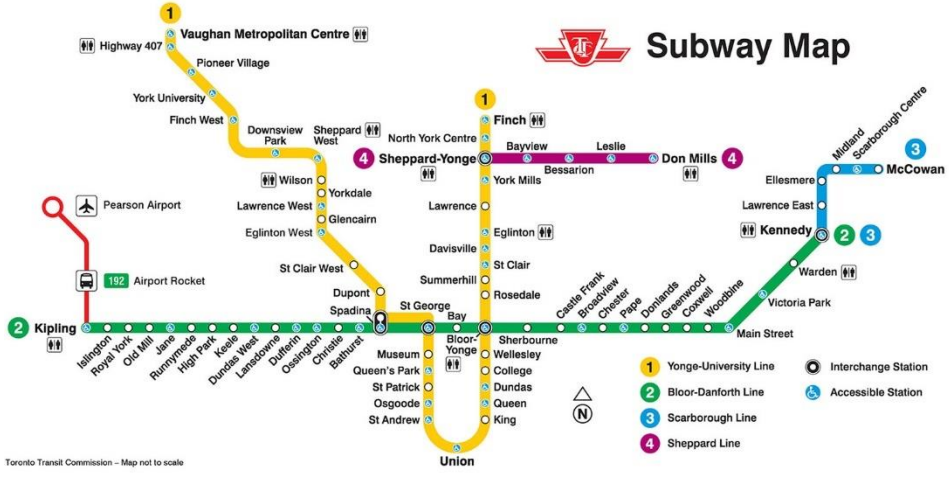
Good network infrastructure lays the foundation for strong ridership, but service frequency and reliability are more significant for building and retaining ridership in each corridor.

Terminology

Terms	Description
Heavy Rail (Subway, Metro)	High-capacity electric railway operating in an exclusive right-of-way, often but not always tunneled or elevated. Example: the TTC subway is Heavy Rail, under North American terminology.
Exclusive ROW Light/Intermediate Rail	Intermediate-capacity electric railway operating in an exclusive right-of-way. Example: the TTC "Scarborough RT" is intermediate capacity, and once in operation the Eglinton Crosstown will be over 50% exclusive right-of-way.
Semi-exclusive ROW Light Rail	Intermediate-capacity electric railway operating in a mixture of rights-of-way, including tunneled, elevated, and at-grade. Example: the TTC 501 Queen streetcar at High Park operates in exclusive sections which are broken up by mixed-traffic intersections.
Non-exclusive ROW (Streetcar, Tram)	Intermediate-capacity electric railway operating in a mixed-traffic environment, subject to blockage by non-transit vehicles. Example: the TTC 504 King streetcar shares its lane with passenger cars for almost its entire route, despite being Toronto's single busiest surface transit line.
Regional Rail	Higher-speed heavy rail operating in an exclusive right-of-way at greater distances, often connecting disparate cities. Example: Metrolinx GO Transit
Unlinked Trips	A single boarding of a single vehicle Example: bus> subway > bus = 3 unlinked trips
Linked Trips	A series of boardings required to complete a single continuous journey Example: bus > subway > bus = 1 linked trip

Toronto

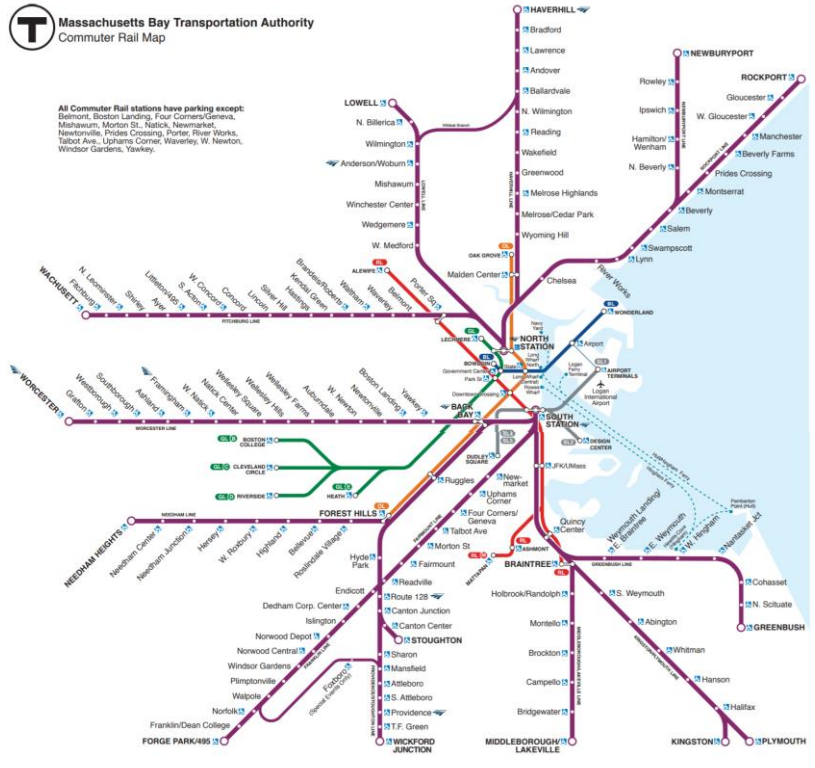
Mode	Length	Stations/Stops
Heavy Rail (Subway, Metro)	72.6 km (79.2 in late 2020's)	70 (71 in late 2020's)
Exclusive ROW Light & Intermediate Rail	6.4 km (16.4 in ~2022)	6 (19 in ~2022)
Semi-exclusive ROW Light Rail	23.2 km (43.2 in ~2022)	68 (98 in ~2022)
Non-exclusive ROW (Streetcar, Tram)	83 km	~300
Regional Rail (non-TTC)	452 km	66
Construction Note:	Lines 5 & 6 scheduled to begin service in 2021-22. Line 3 to close in late 2020's, as new subway extension with one stop opens, serving busiest Line 3 stop.	
Unlinked Trips Per Day (APTA 2017)	TTC Heavy Rail: TTC Intermediate: TTC Streetcars: TTC Bus: GO Rail: Wheel-Trans:	877,300 37,800 287,800 1,406,800 204,200 13,800
TTC Ridership (2017)	856,953,100 (unlinked trips, APTA) 535,000,000 (linked rides, TTC)	



Boston

Mode	Length	Stations
Heavy Rail (Subway, Metro)	68.1 km	62
Exclusive ROW Light & Intermediate Rail	37 km (43.9 in ~2022)	66 (73 in ~2022)
Regional Rail	641 km	137

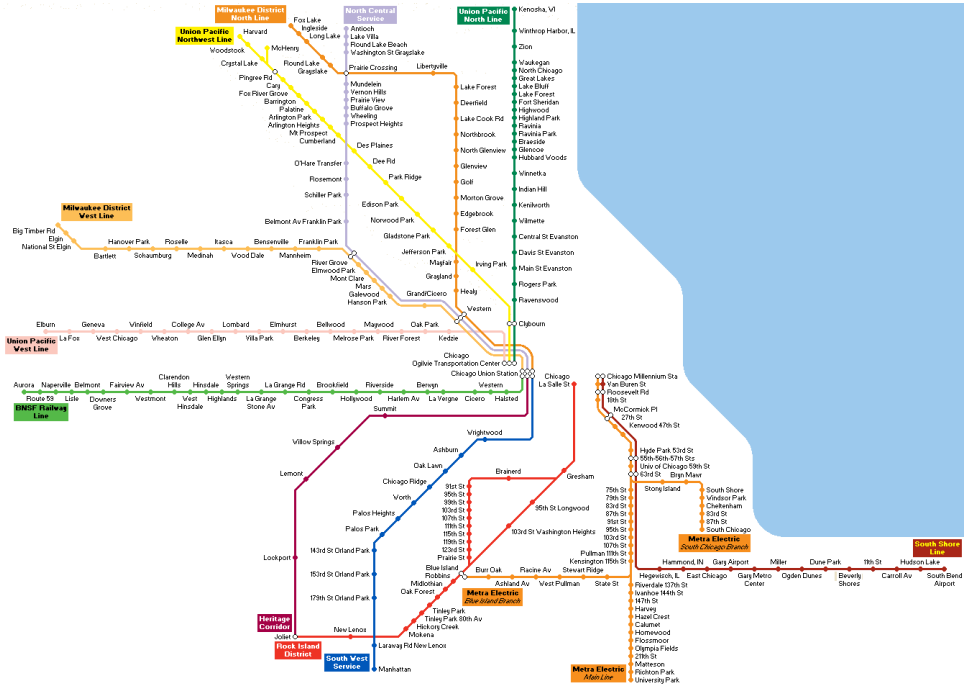
Construction Note:	Green Line light rail extension in progress	
Unlinked Trips Per Day (APTA 2017)	Heavy Rail:	321,000
	Light Rail:	204,000
	Bus:	233,100
	Commuter Rail:	123,100
	ParaTransit:	6,400
Ridership (2017, APTA)	387,629,600 (unlinked trips)	

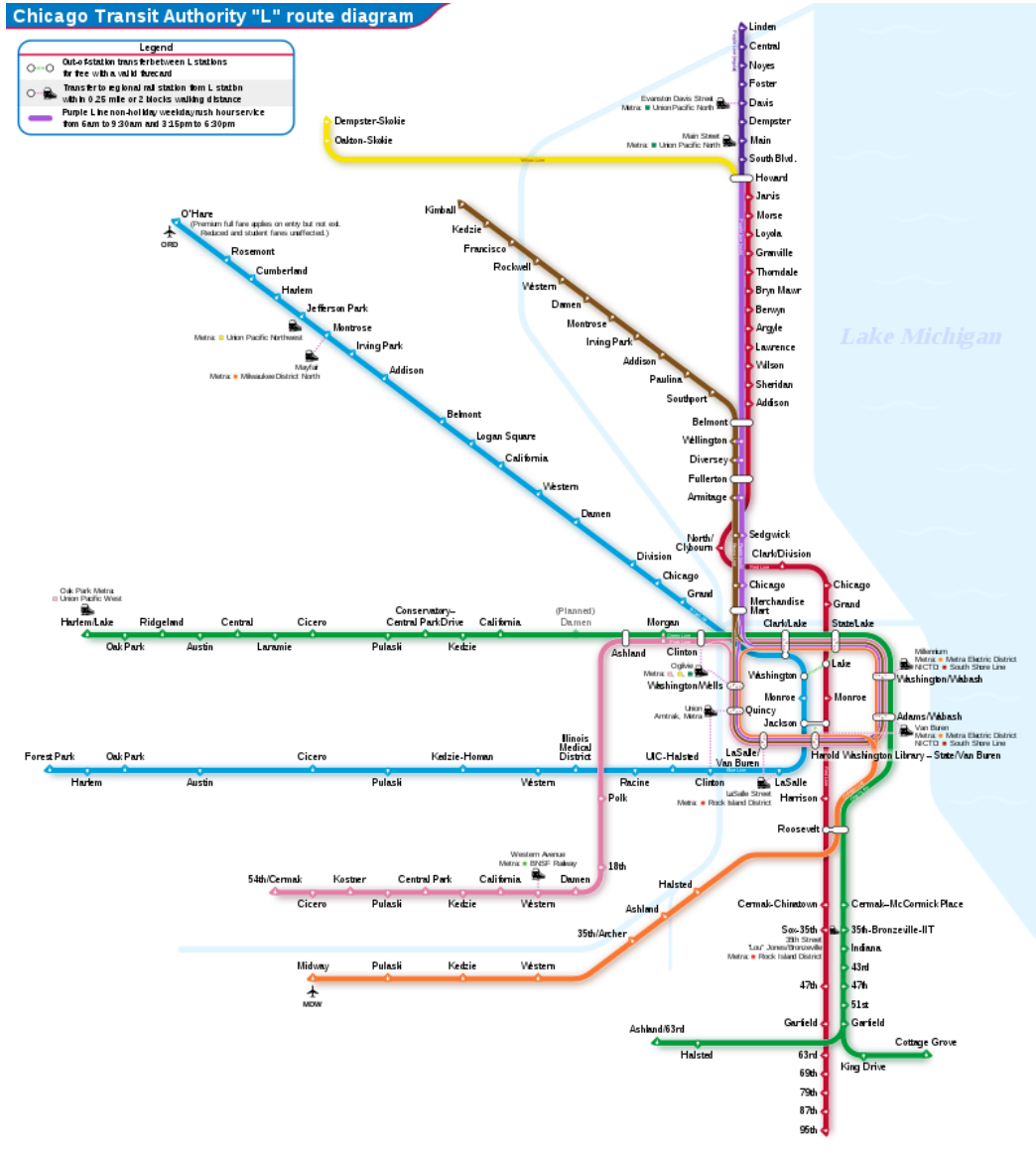


Chicago

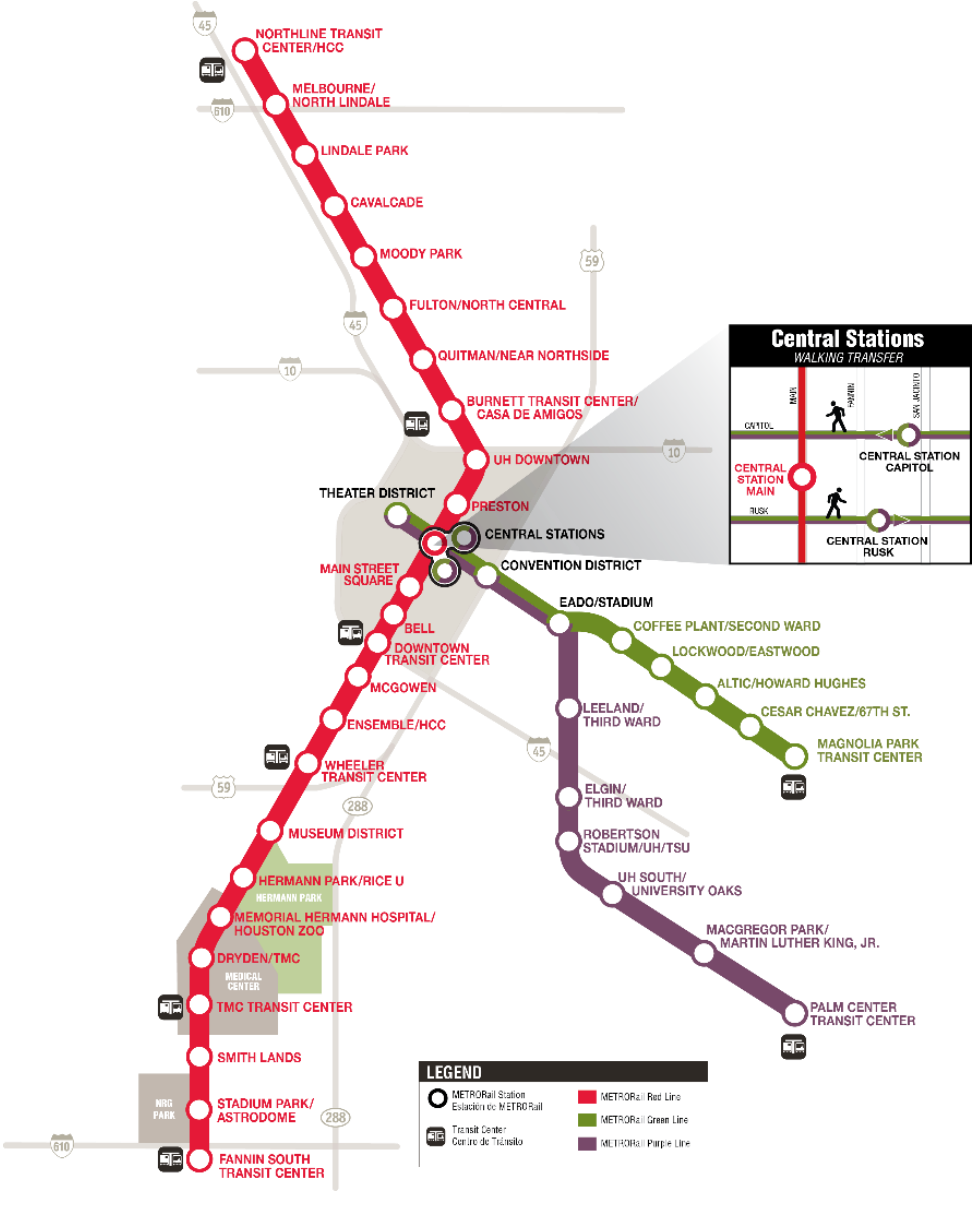
Mode	Length	Stations
Heavy Rail (Subway, Metro)	169 km	146
Regional Rail (non-CTA)	785 km	242
Unlinked Trips Per Day (APTA 2017)	CTA Heavy Rail: CTA Bus: Metra Commuter Rail: PACE ParaTransit:	729,200 805,500 285,400 17,600
CTA Ridership (2017, APTA)	479,435,200 (unlinked trips)	

Commuter Rail





Houston

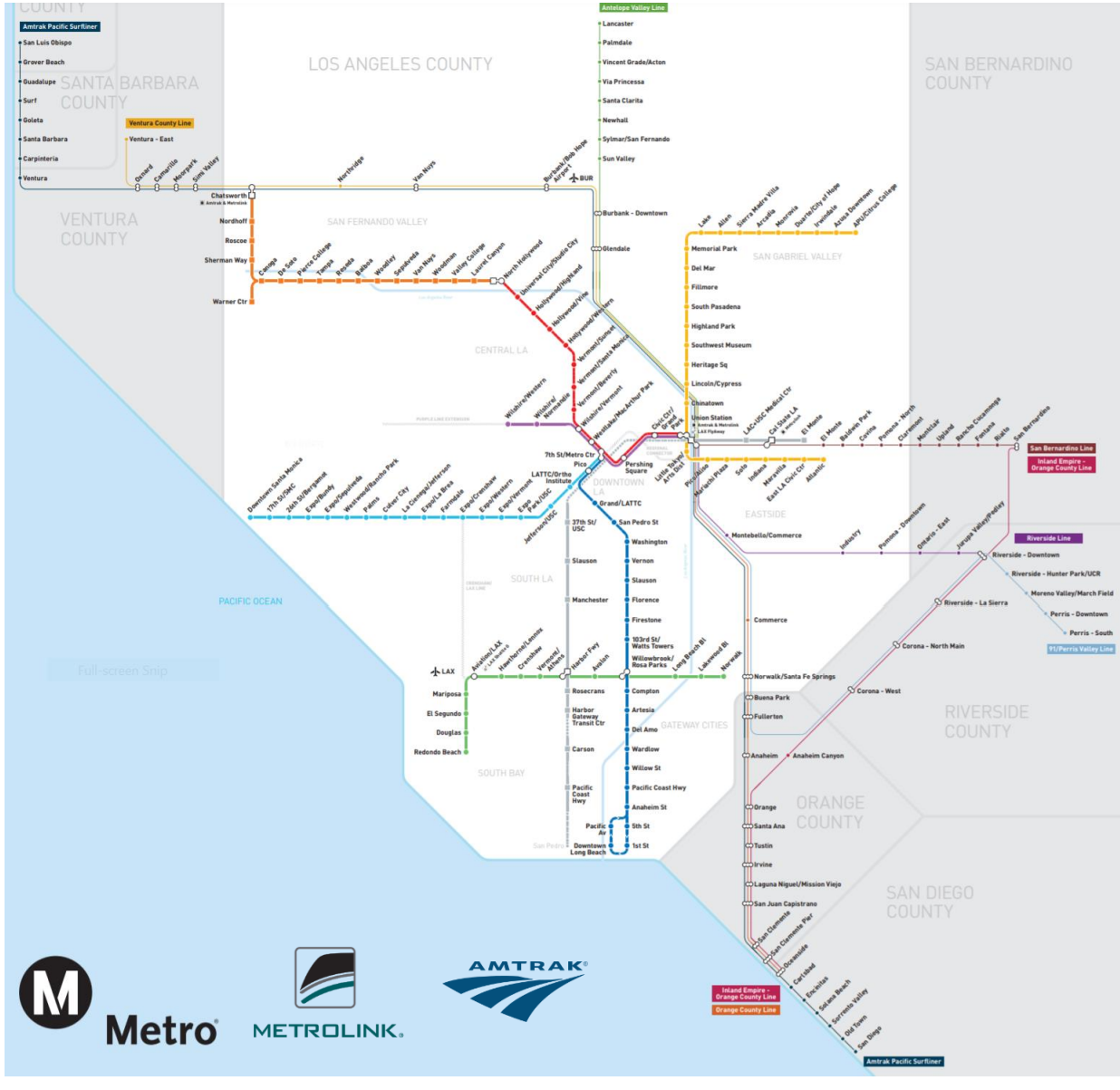


Mode	Length	Stations/Stops
Semi-exclusive ROW Light Rail	36.5 km	39
Unlinked Trips Per Day (APTA 2017)	Light Rail: Bus: ParaTransit:	61,100 222,800 6,400
Ridership (2017, APTA)	88,799,300 (unlinked trips)	

Los Angeles

Metro

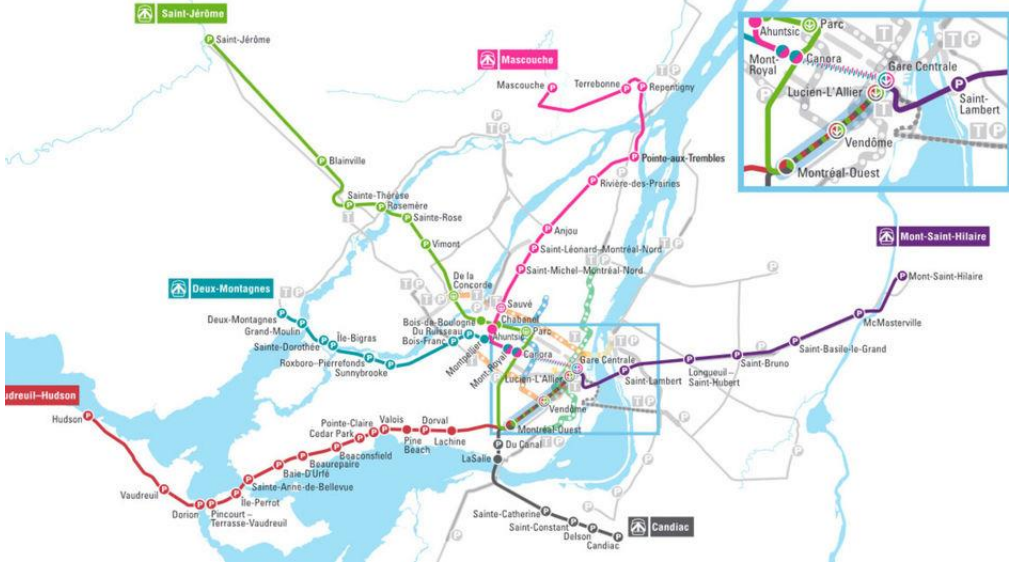
Mode	Length	Stations/ Stops
Heavy Rail (Subway, Metro)	31.6 km	22
Exclusive ROW Light & Intermediate Rail	31.3 km	14
Semi-exclusive ROW Light Rail	110.1 km (123.8 in ~2019)	68 (76 in ~2019)
Regional Rail (non-Metro)	859 km	61
Construction Note:	New Crenshaw/LAX Light Rail line on west side of city, scheduled to open in 2019.	
Unlinked Trips Per Day (APTA 2017)	Subway: Light Rail: Bus: Commuter Rail: ParaTransit:	138,500 219,900 896,400 37,800 10,800
Metro Ridership (2017, APTA)	397,489,400 (unlinked trips)	



Montreal

Mode	Length	Stations
Heavy Rail (Subway, Metro)	69.2 km	68
Regional Rail (non-STM)	256.4 km	62
Construction Note	Réseau express métropolitain (REM) light rail lines in the centre, north, and west of city, scheduled to begin service in 2021.	
Unlinked Trips Per Day (APTA 2017)	Subway: Bus: Commuter Rail: ParaTransit:	1,298,400 917,000 84,900 13,900
Ridership (2017, APTA)	643,087,600 (unlinked trips)	

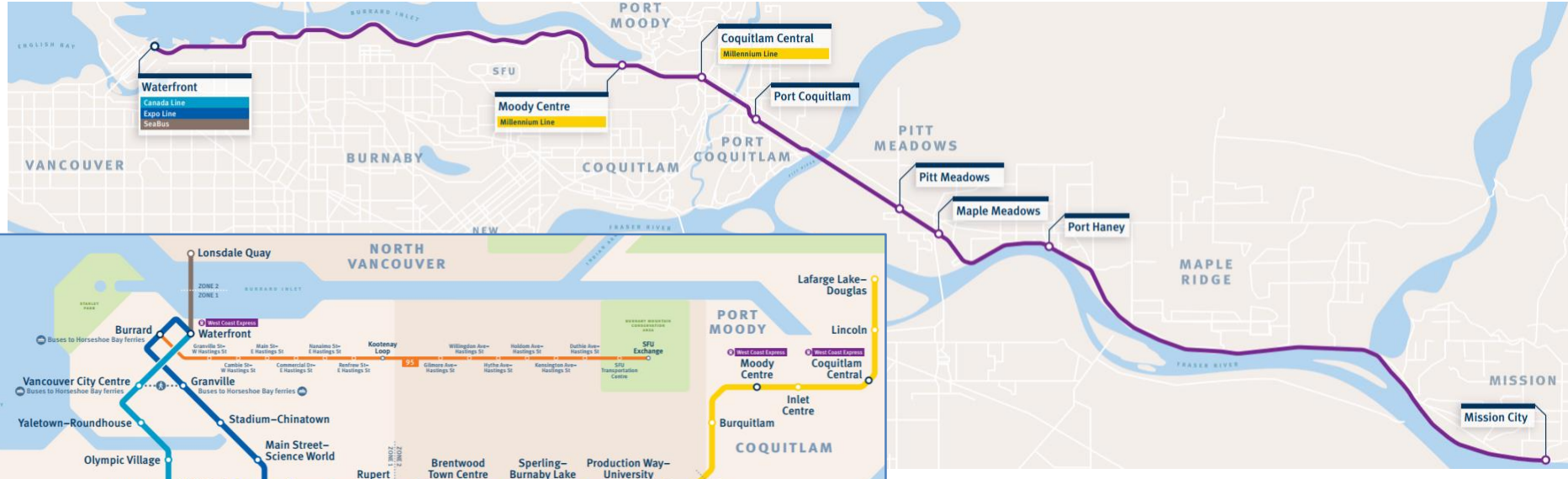
Commuter Rail

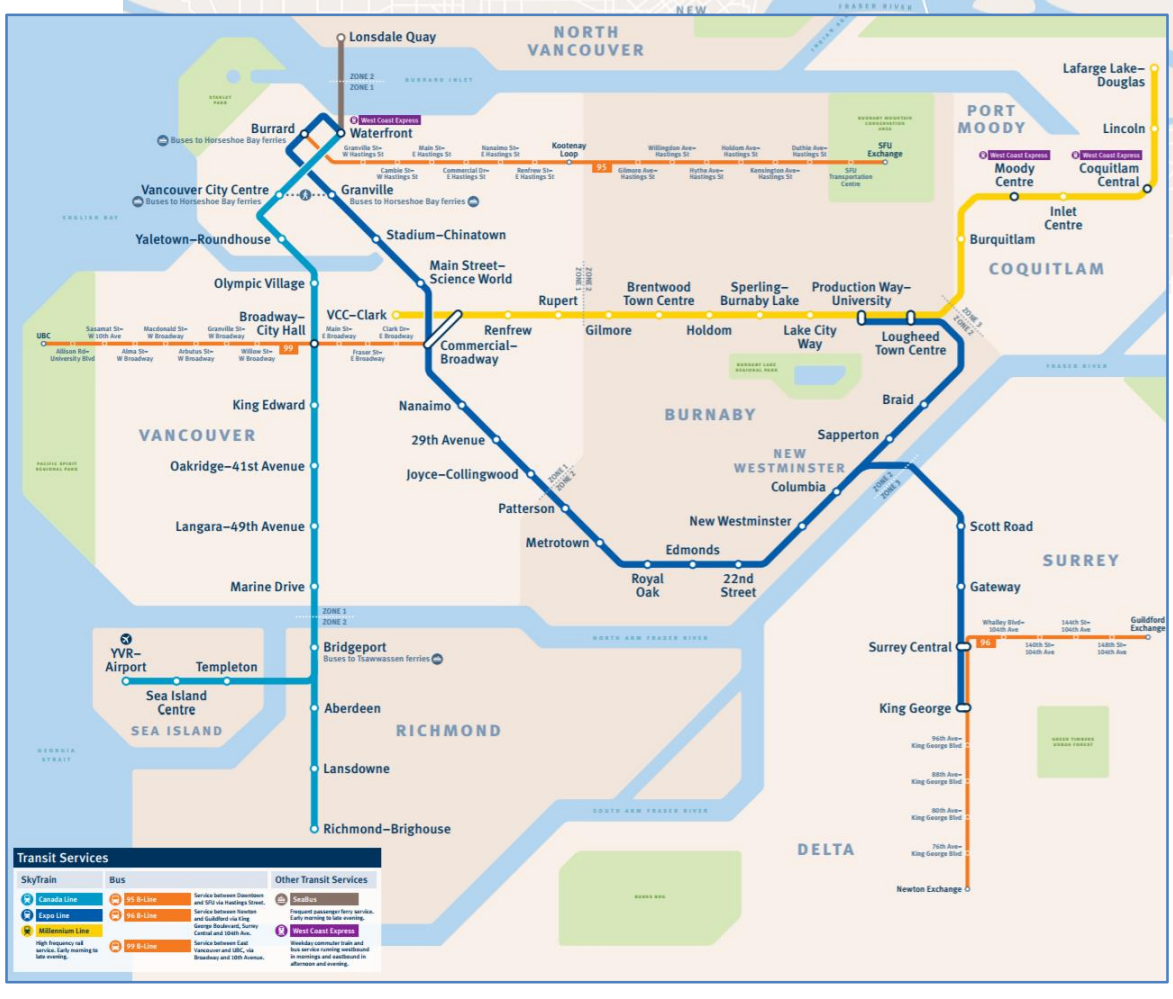


Vancouver

TRANSLINK

Commuter Rail





Mode	Length	Stations
Exclusive ROW Light & Intermediate Rail	79.6 km	53
Regional Rail	69 km	8
Unlinked Trips Per Day (APTA 2017)	SkyTrain: Bus: Ferry: Commuter Rail:	472,100 789,400 16,700 9,300
Ridership (2017, APTA)	406,842,500 (unlinked trips)	

Washington, D.C.

Commuter Rail (MARC & VRE)

Mode	Length	Stations
Heavy Rail (Subway, Metro)	189.7 km	94
Semi-exclusive ROW Light Rail	3.9 km	9
Regional Rail	446 km	61
Construction Note:	Silver Line 18.5 km northwest expansion to Dulles airport, scheduled to begin service in 2020.	

Unlinked Trips Per Day (APTA 2017)	Subway: Light Rail: Bus: Commuter Rail: ParaTransit:	760,200 3,700 374,600 (est) 77,000 (est) 8,000
Ridership (2017, APTA)	346,342,000 (unlinked trips)	

Line Names, Colours, Lengths, and Stations

Toronto (TTC) – 144 stns

Line 1 - 39.6 km

Line 2 - 27.5 km

Line 3 - 6.4 km

Line 4 - 5.5 km

The station count beside each city's name includes all exclusive and semi-exclusive right-of-way (ROW) stations and stops, but excludes purely mixed-traffic stops.

Boston (MBTA) – 128

Green - 36.4 km

Red – 33.0 km

Orange – 18.0 km

Blue - 9.5 km

Chicago (CTA) – 146

Blue - 44.5 km

Red - 35.5 km

Green - 32.5 km

Orange - 20.0 km

Brown - 18.2 km

Pink - 17.0 km

Yellow - 8.0 km

Purple - 6.4 km

Houston METRORail – 39

Red – 12.0 km

Purple - 10.6 km

Green - 5.3 km

Los Angeles Metro – 104

Gold - 50.1 km

Blue - 35.5 km

Green - 31.3 km

Expo - 24.5 km

Red - 23.6 km

Purple – 8.0 km

Montreal (STM) – 68

Orange – 30.0 km

Green - 22.1 km

Blue - 9.7 km

Yellow - 4.3 km

Vancouver (Translink) – 53

Expo – 35.0 km

Millennium - 25.3 km

Canada - 19.5 km

Washington, D.C. – 103

Red – 51.3 km

Blue - 48.8 km

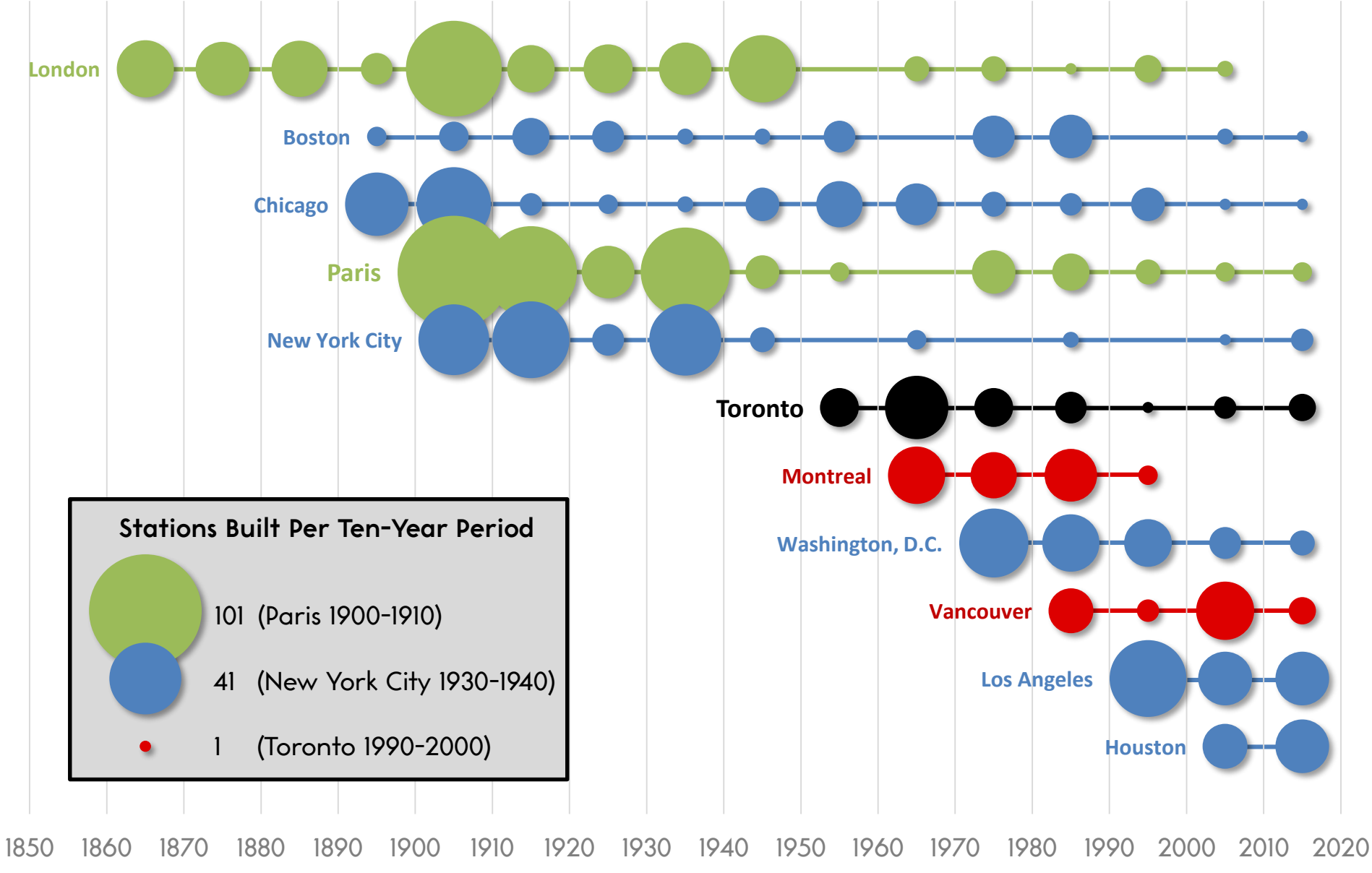
Silver - 47.6 km

Orange - 42.5 km

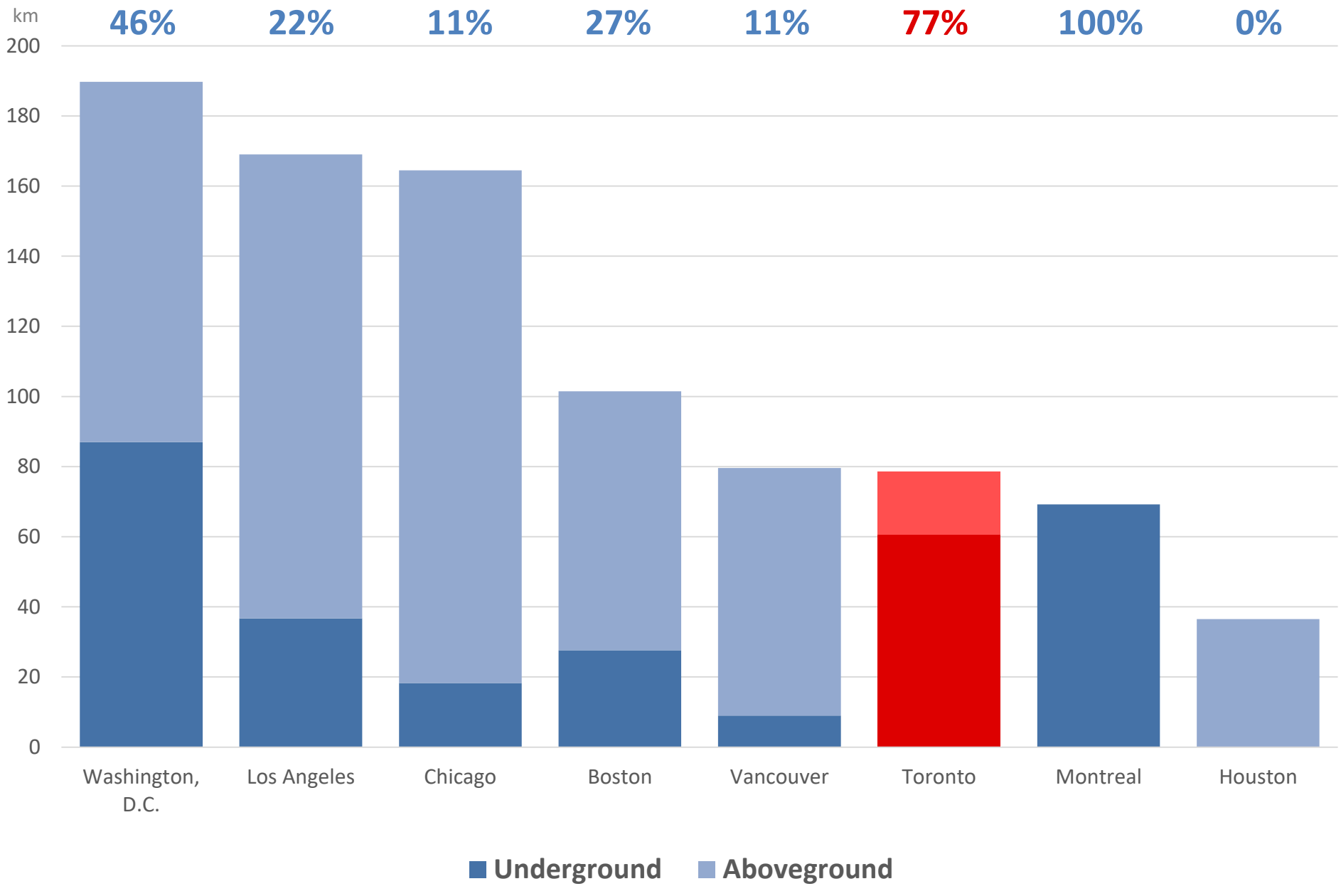
Green - 37.1 km

Yellow - 24.3 km

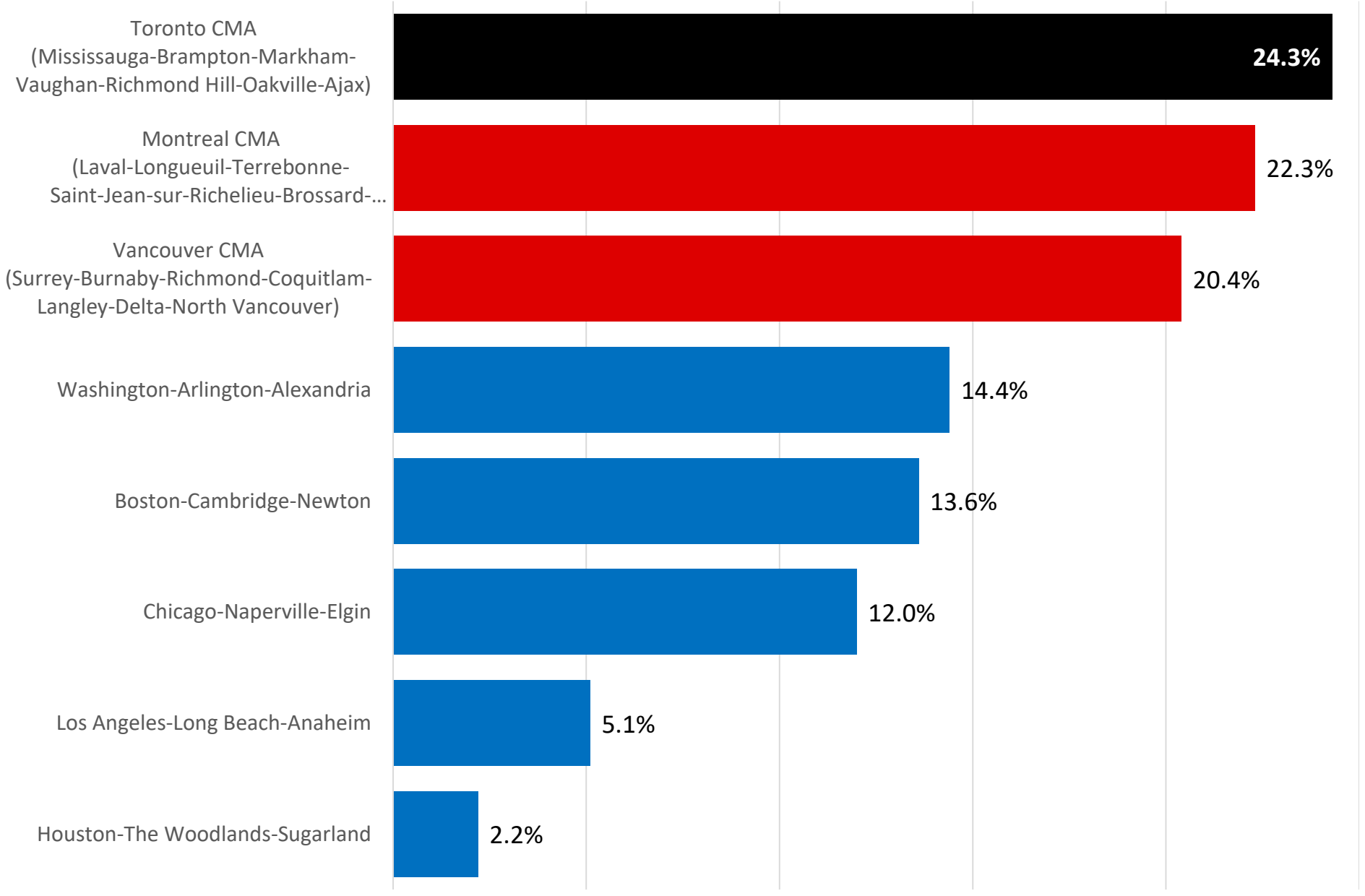
Urban Core Rail Network Growth



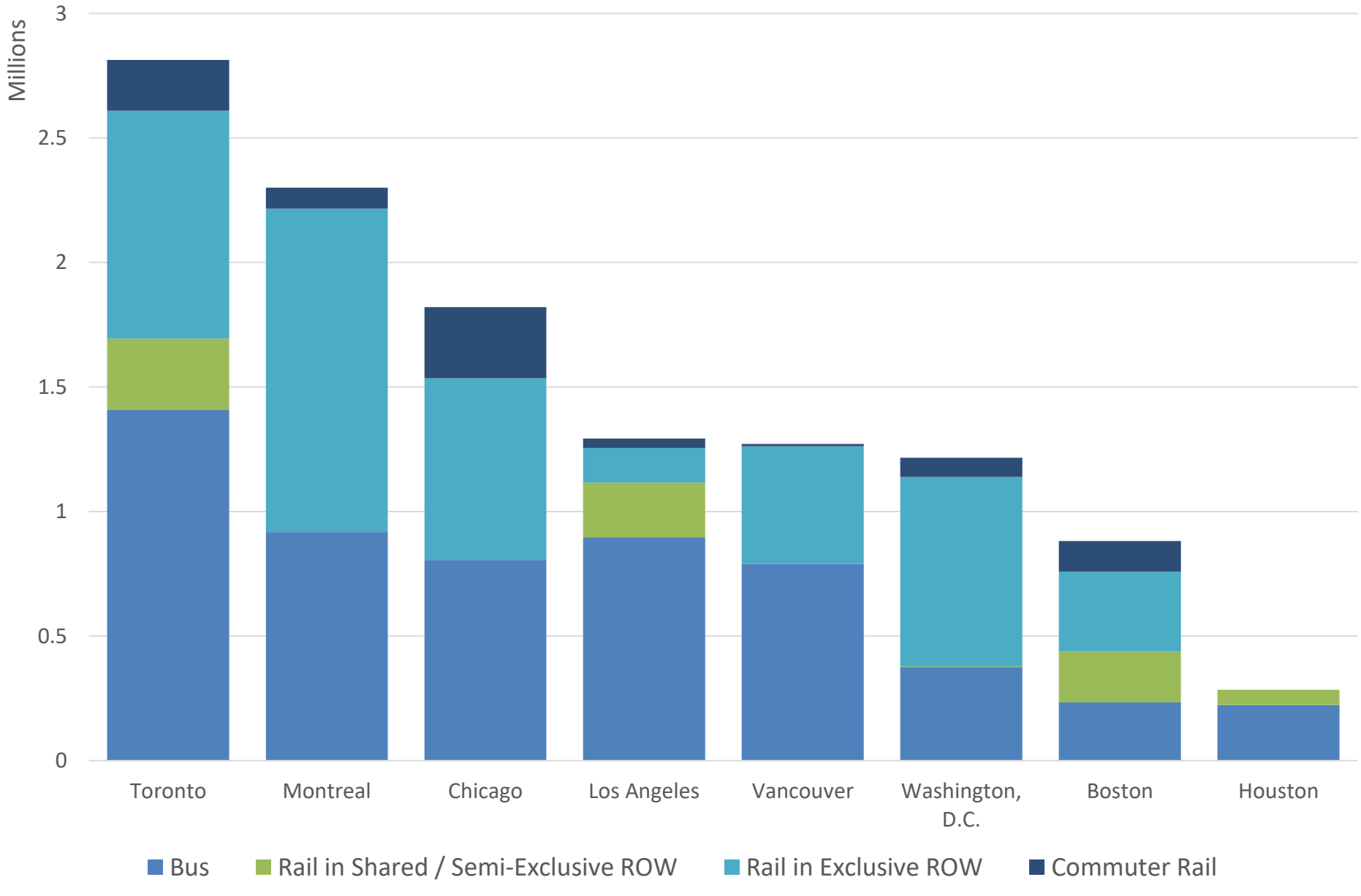
Proportion of Urban Core Rail Underground



Public Transit Commuter Mode Share

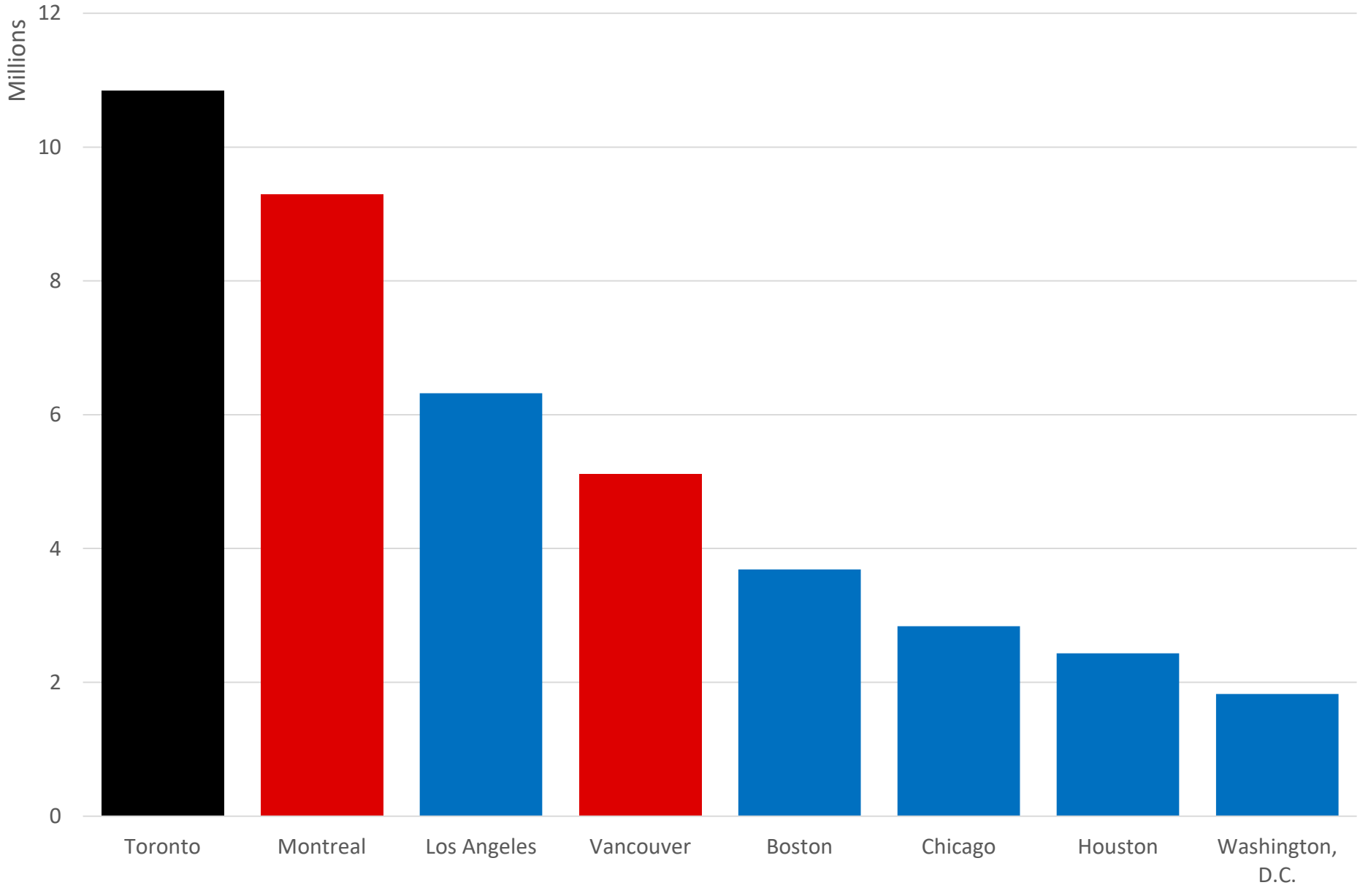


Average Weekday Ridership by Transit Mode



Ridership per Kilometre of Rail

Ratio of annual local system ridership to exclusive right-of-way rail lines



Operating Budgets

There is no perfect or universal structure for public transit agency funding. But there are lessons to be learned. Funding of public transit is part of cities' democratic practice, and the choices we make on who must pay for what level of service or access are not neutral or obvious. Public transit is a public service, not a profit centre, thus every city (without a large money-generating property portfolio) must subsidize its transit. The level of subsidy and the security of the funds determine service and expansion decisions.

Consensus is rarely possible in transit taxation decisions, but we should aim to strengthen planning and decision-making by dedicating transparent revenue streams to specific uses. ■

Commonalities

- The cost of labour for all transit agencies pushes back against improved service
- Advertising's degradation to the brand far outweighs the small revenue it provides
- Network expansion competes and wins funding over ongoing operational needs

Differences

- Toronto has the highest farebox recovery ratio, lowest overall subsidy, lowest subsidy per rider, and lowest overall revenue per rider among the cities studied
- Toronto has no predictable revenue stream from a dedicated tax or levy

Transit systems are complex and dynamic systems, whose costs may fluctuate due to many factors. Changes in fuel costs and the ups and downs of ridership may affect the bottom line with little warning, leading to common mid-year service adjustments, just as in the private sector.

But transit's largest expense is labour, and budget pressures here create a consistent annual incentive to reduce service, which can improve the bottom line but betray transit's reason for existence.

Establishing and planning operations at an appropriate level requires stable, predictable funding. Secure funding is also needed to maintain the system in a state-of-good-repair and to expand operations to improve service and increase ridership. Long-term capital planning also needs secure relationships with funding sources and governments. **Toronto lags well behind other North American cities in this regard.**

The TTC relies on the farebox more than any other city in North America. In all comparator cities, the annual operating subsidy covers more than 50% of the operating budget. In Boston and Houston, it is more than 70%, and in Los Angeles it is nearly 90%. **Toronto's operating subsidy is just 30%.**

Even close to home, the difference is striking. The per-rider subsidy for the TTC is dramatically smaller than what is provided to riders in municipalities in the surrounding GTHA. **Markham pays $4.56 per rider, fully five times Toronto's $0.90**. Suburban transit is normally far more costly per-rider, but this contrast is key to GTHA fare integration, especially amidst claims of cost neutrality.

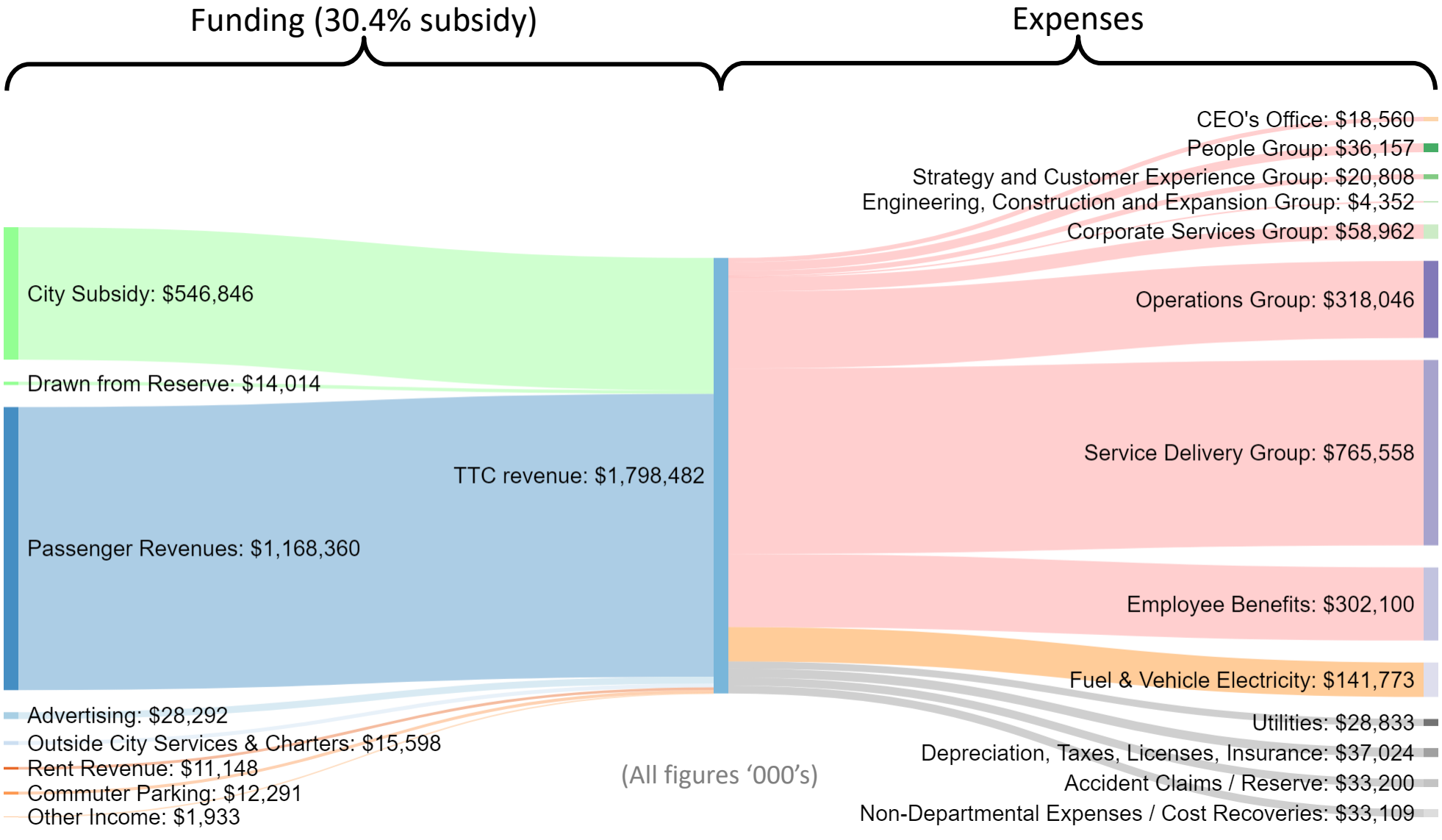
The TTC's operating budget is disproportionately small for its ridership. When compared with other cities, **Toronto has the least to spend, per rider**. Toronto has $2.10 per rider, less than half Vancouver's level, even though the TTC carries more than twice the riders. US cities have even higher per-rider revenue, with Los Angeles topping out the list with $15.16 in revenue per rider, despite its far lower mode share.

Toronto's biggest differentiator is the lack of a designated revenue stream for transit. **Almost every other city has a dedicated tax providing stable, predictable funding**.

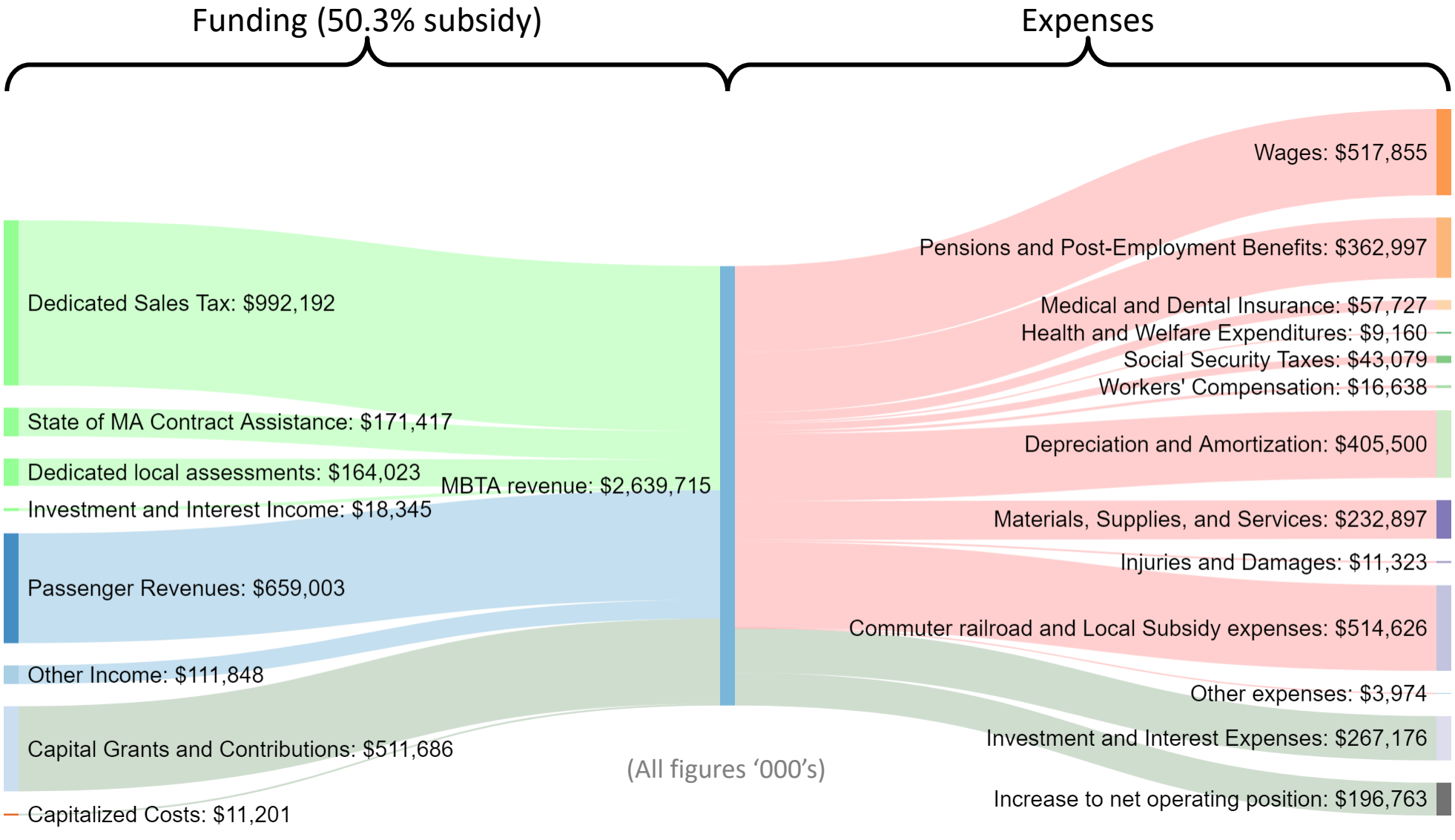
In Montreal and Washington DC, participating regions/counties and cities contribute a subsidy calculated in relation to their population. In other cities with transit-dedicated taxes, these sources contribute a significant share of the transit agency's revenue. In Houston, the sales tax contributes over 65% of Metro's revenue. In Los Angeles, voters have approved transit-dedicated sales taxes in multiple elections.

The status quo of low subsidy and unpredictable funding leaves Toronto's riders at great risk.

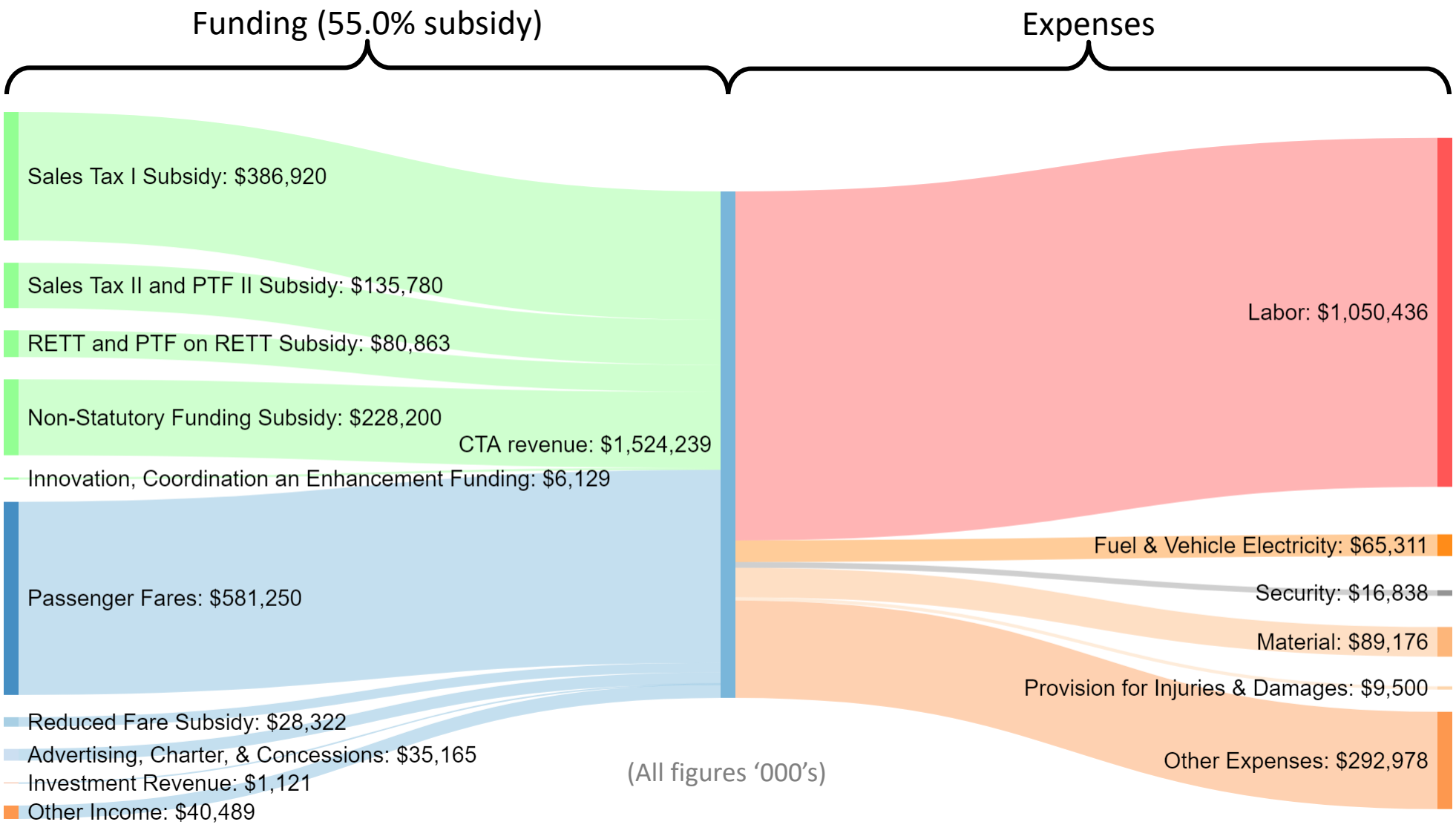
Toronto TTC (2017)



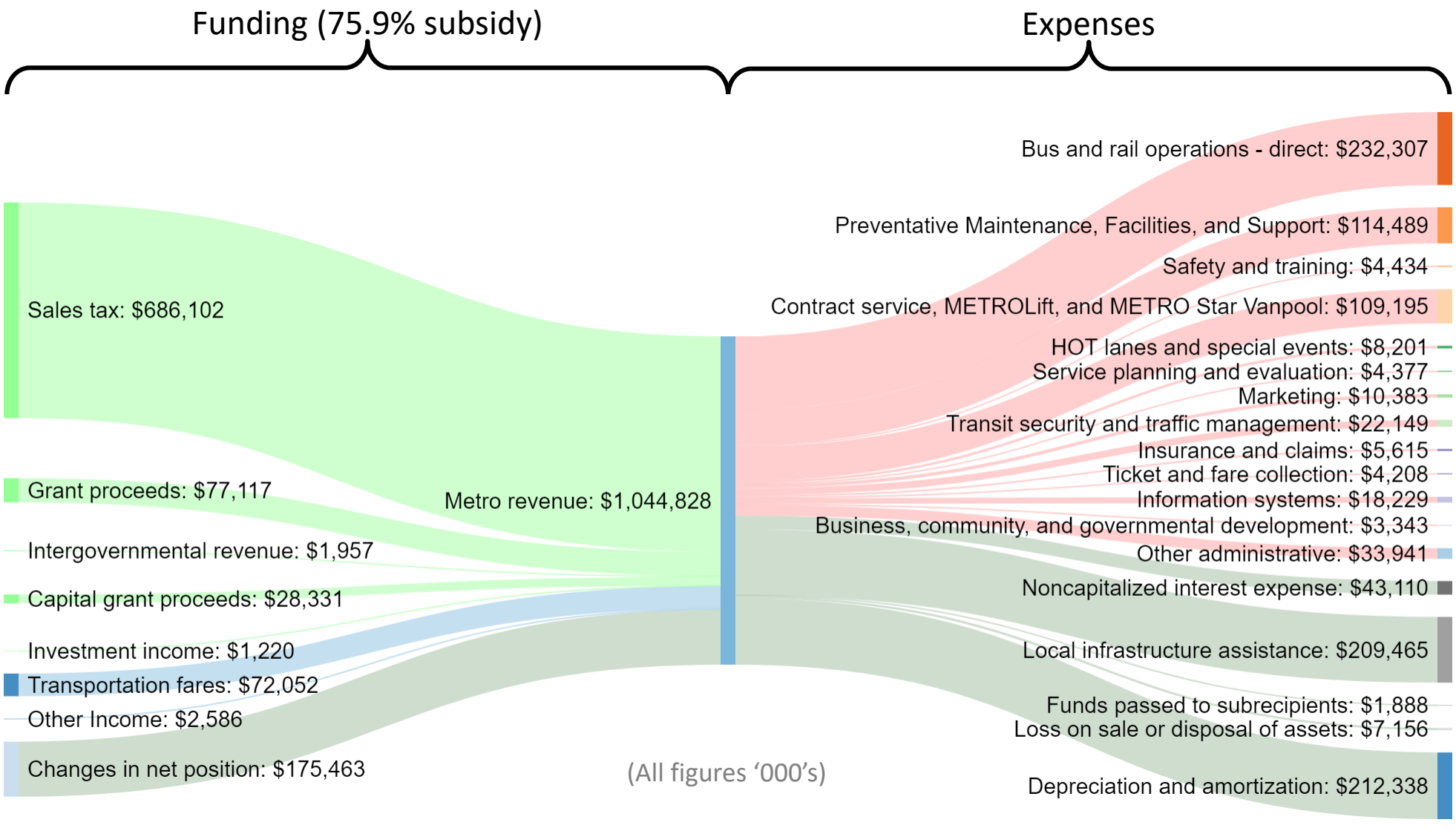
Boston MBTA (2017)



Chicago CTA (2017)

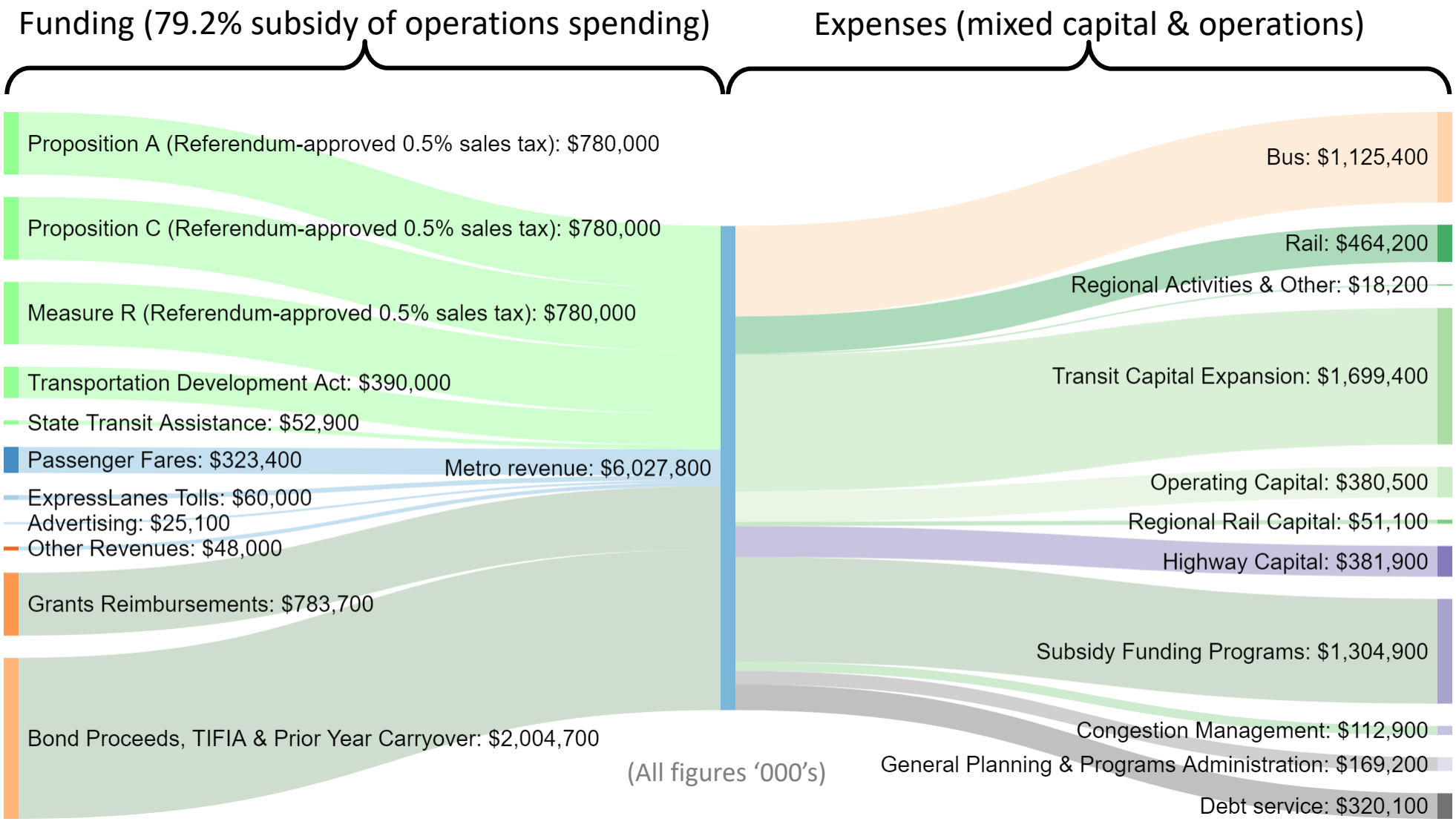


Houston Metro (2016)



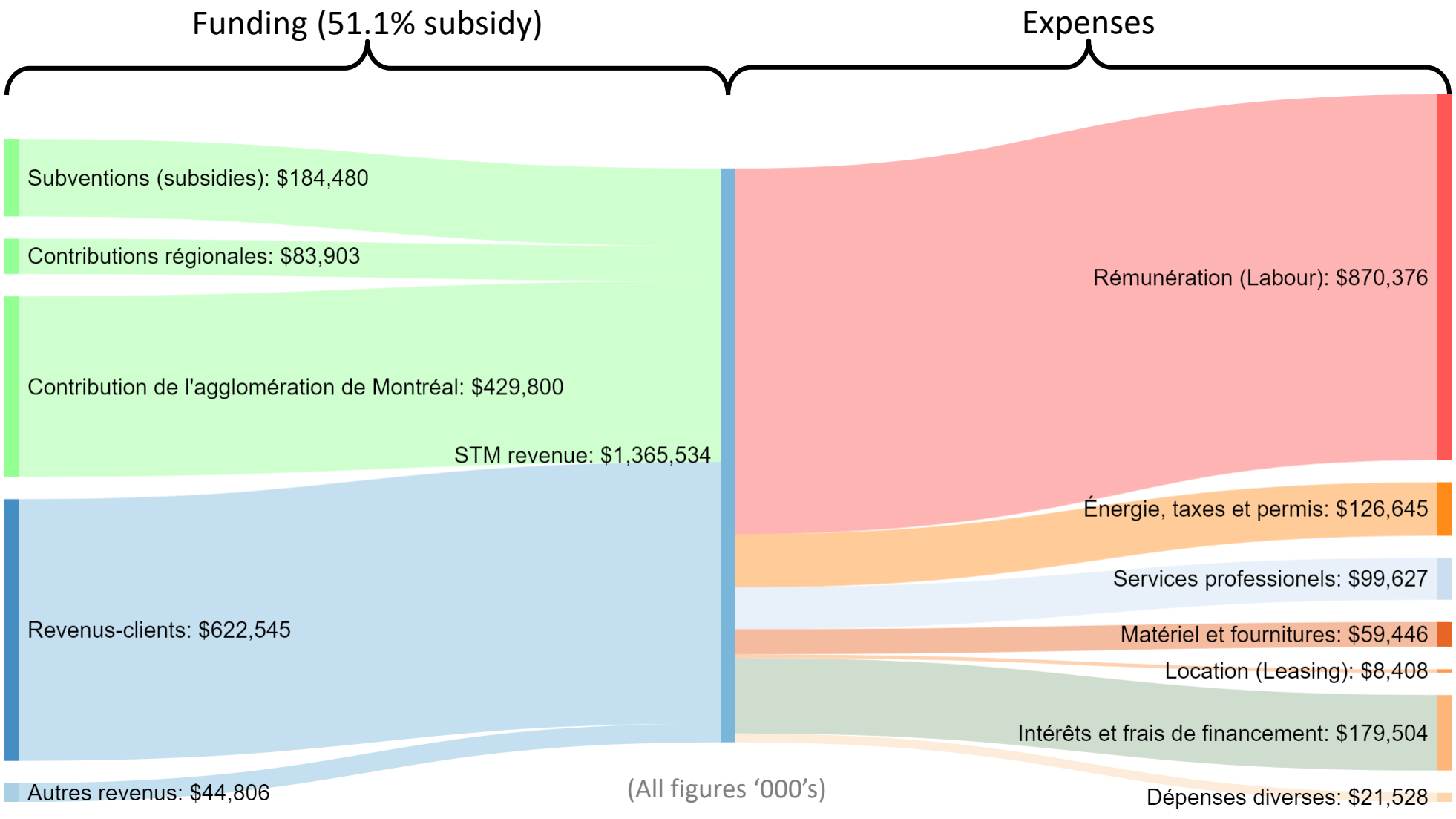
Los Angeles Metro (2017)

Metro

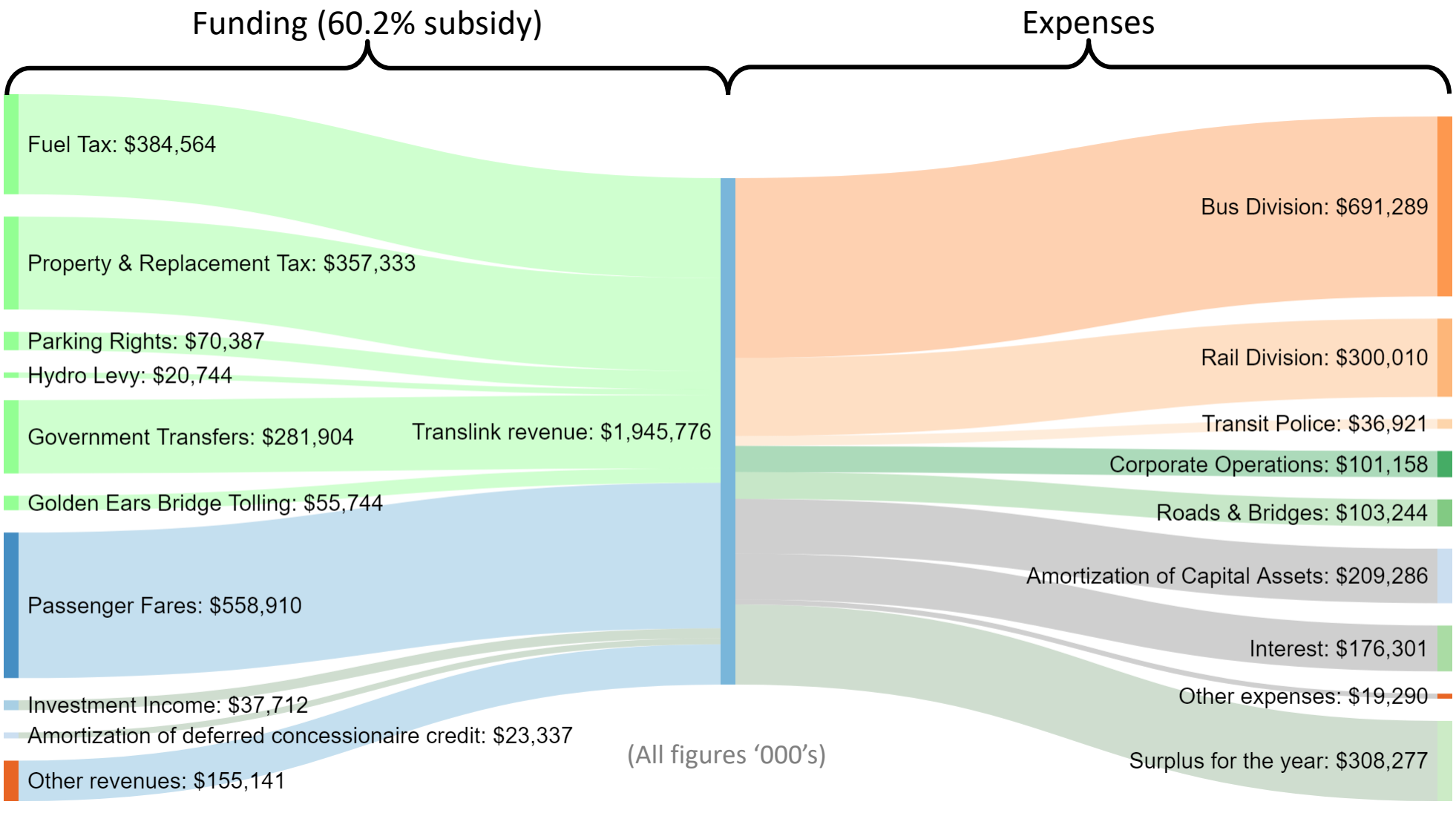


Los Angeles Metro's annual budget combines capital and operations, making direct comparisons difficult.

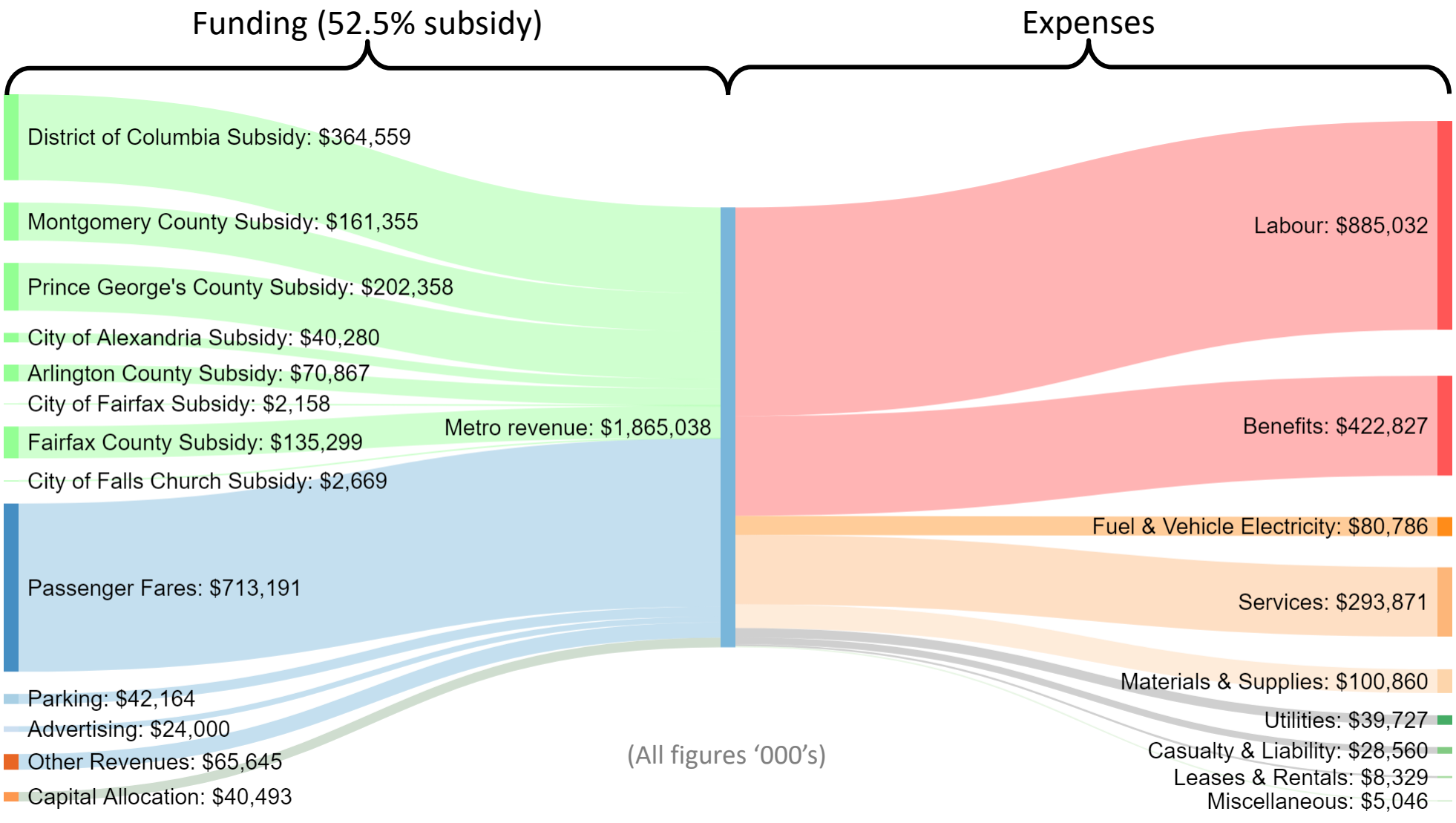
Montreal STM (2016)



Vancouver Translink (2017)

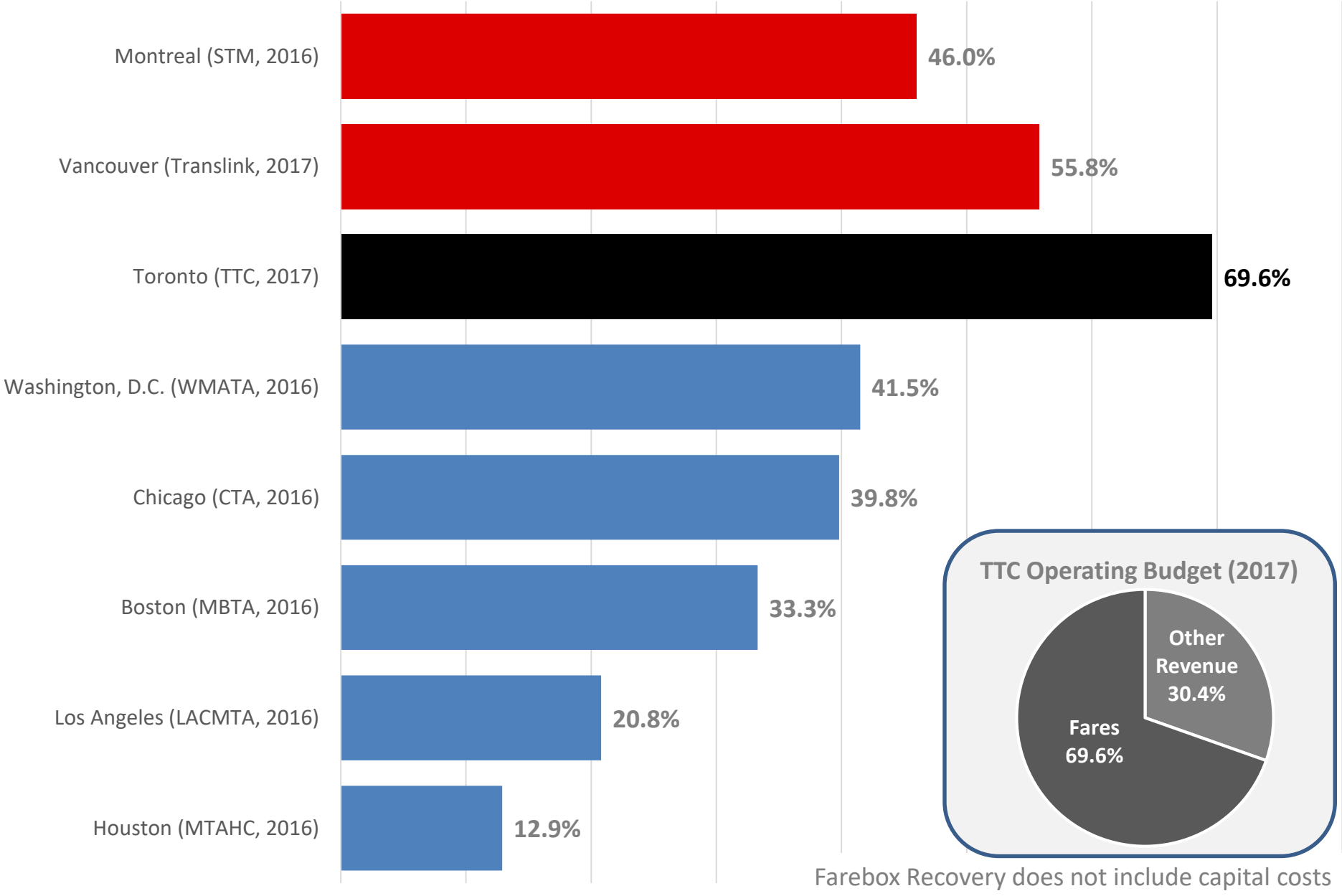


Washington, D.C. WMATA (2018)



Farebox Recovery Ratio

Operating costs covered by passenger fares



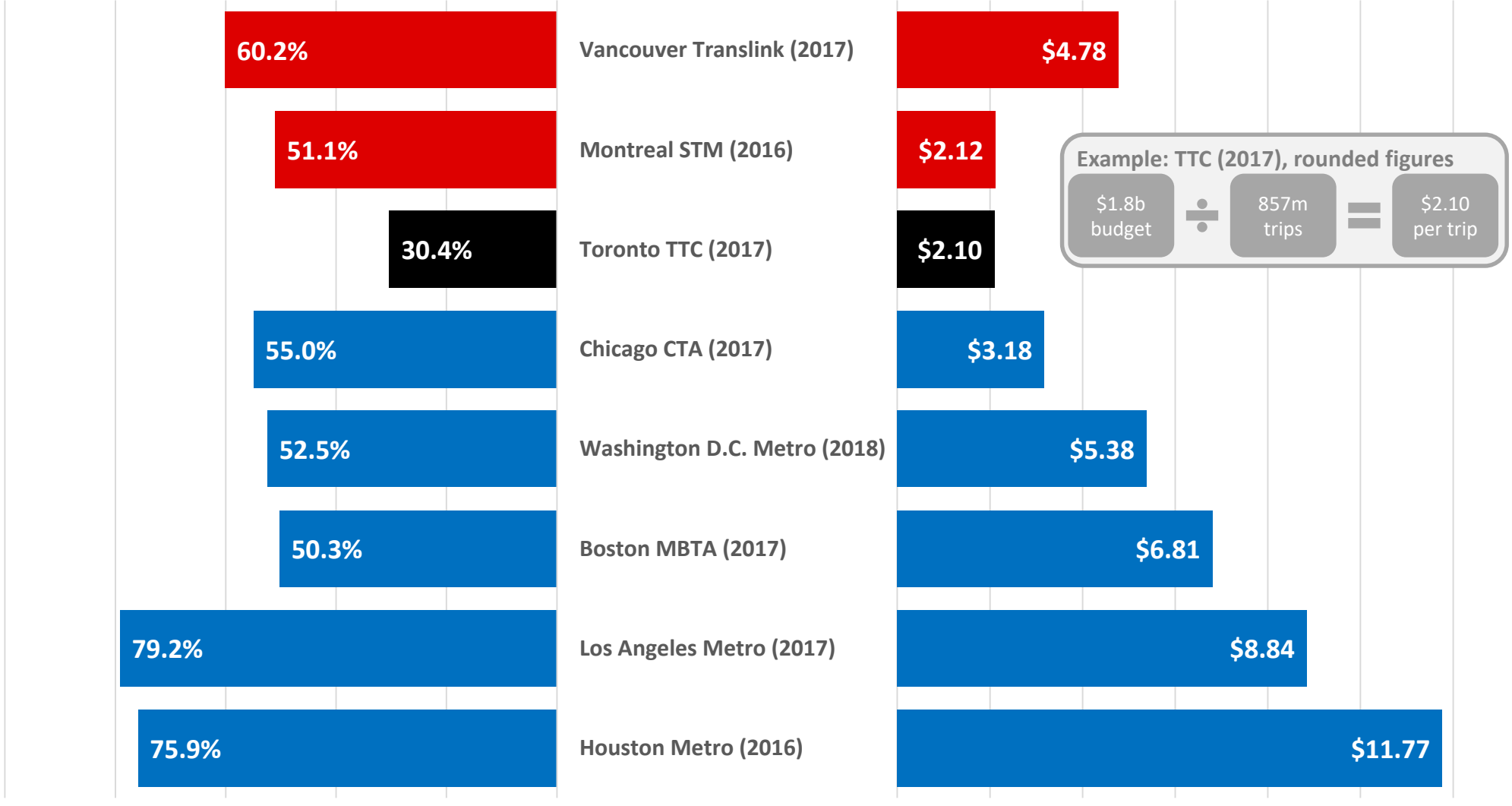
Farebox Recovery does not include capital costs (new construction, vehicles, buildings, signals, etc.)

Annual Operating Subsidy

Total subsidy from all sources

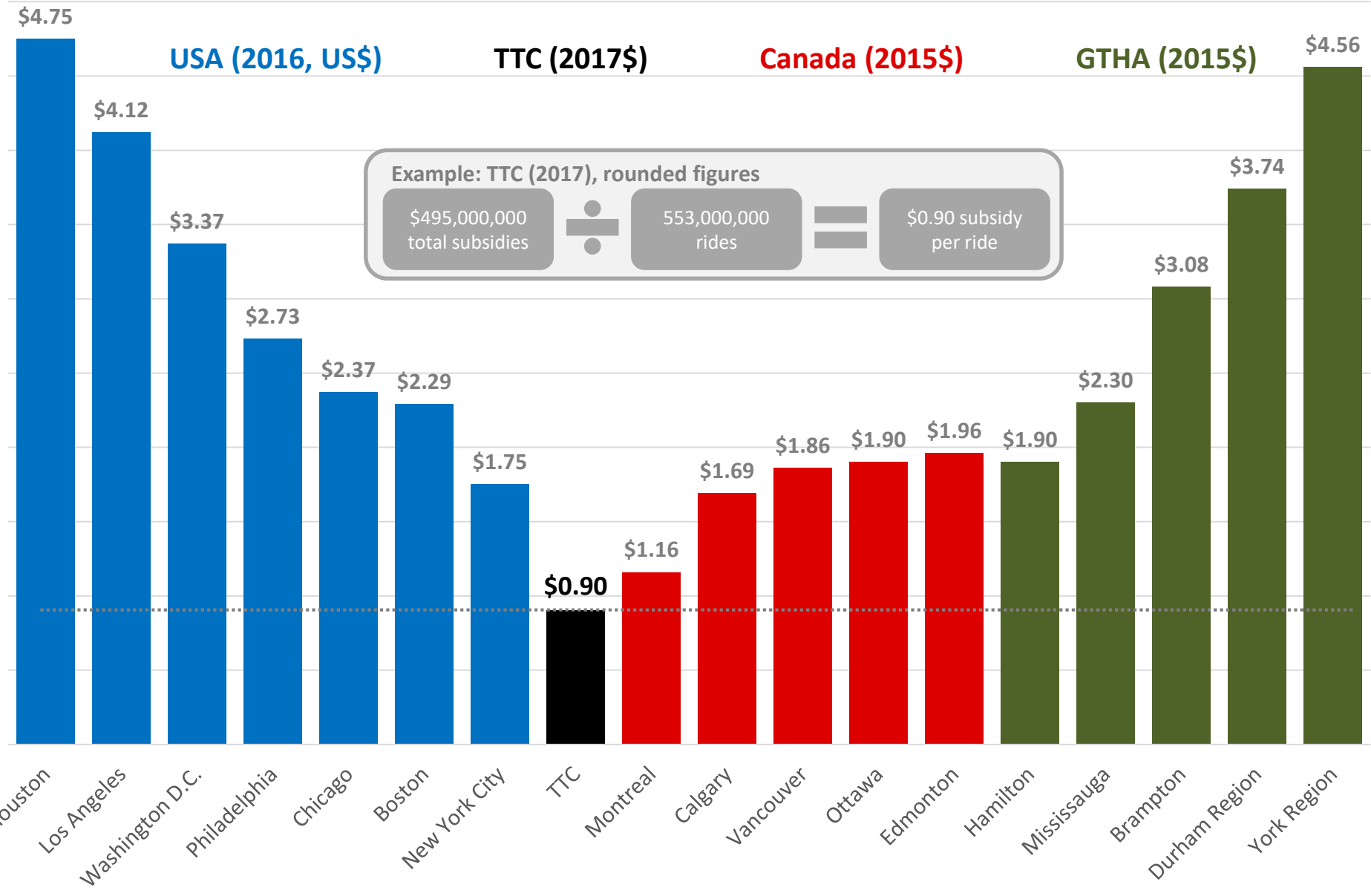
Operating Budget per Trip

Per-unlinked-trip representation of total budget from all sources



Subsidy per Transit Rider

Per-rider representation of the total subsidy from all sources



Dedicated Revenue Sources and Recent Recommendations

Dedicated revenue sources:	Sales Tax	Gas and Fuel Taxes	Parking Tax	Dev Charges	Tolls	Paid Parking	Vehicle Tax	Land Transfer Tax
Toronto	☐	▪	☐	☐	☐	■	☐	☐
Boston	■	☐	☐	☐	☐	■	☐	☐
Chicago	■	☐	☐	☐	☐	■	☐	■
Houston	■	☐	☐	☐	☐	■	☐	☐
Los Angeles	■	☐	☐	☐	☐	■	☐	☐
Montreal	☐	☐	☐	☐	☐	■	☐	☐
Vancouver	☐	☐	■	☐	■	■	☐	☐
Washington, D.C.	☐	▪	☐	☐	☐	■	☐	☐

Recommended by:

Metrolinx Investment Strategy (2013)	■	■	■	■	■	+ Land Value Capture
Toronto Region Board of Trade (2013)	■	■	■	☐	■	
Transit Investment Strategy Advisory Panel (2014)	■	■	☐	☐	☐	+ Corporate Income Tax
City of Toronto Staff Report (2012)	■	■	■	■	■	+ Vehicle Registration Tax
Canadian Centre for Policy Alternatives (2013)	■	■	■	■	☐	
Ontario Chamber of Commerce (2013)	■	■	■	■	■	

■ Dedicated ▪ Partial ☐ None

Governance

There is no perfect or universal structure for regional transportation governance. But there are lessons to be learned. Governance of public infrastructure is part of cities' democratic practice, and as we design our structures, we should be thinking about how to spend effectively, be transparent in decision-making, represent the diversity of stakeholders affected, and create space for long-term planning supported by sustainable funding. These are all essential characteristics of a strong governance model.

It is not possible to avoid politicizing transit decisions, but we should aim to strengthen decision-making processes to favour evidence and expertise for collective public benefit, not partisan electoral politics. ■

Commonalities

- No rider or Wheel-Trans rider representation on the Board
- Regional population skews provincial government focus and funding toward regional commuters not in City of Toronto property tax base
- No city has privatized local or regional transit agencies

Differences

- Metrolinx board has no elected representatives at all, nor any who are accountable to the City of Toronto.
- PRESTO fare card controlled only by Province of Ontario
- TTC Board public control only indirect, and diversity unlegislated

Our report found that Toronto's governance structure differs from other North American cities in key ways:

Toronto's principal transportation provider, the TTC, has limited oversight of transportation within the city. It has no control of the road network it uses, nor oversight of other forms of transportation. It thus has limited opportunity for prioritizing transit within roadspace or for the coordination of transit with cycling and pedestrian infrastructure.

The TTC is currently phasing out the use of its own tickets, tokens, and passes, with completion expected by mid-2019, and provincial agency Metrolinx's PRESTO fare card will become the sole non-cash fare media option. **No other comparator city has a fare card fully controlled by another level of government with no local oversight.**

The Metrolinx Board of Directors is appointed by the Premier through an Order-in-Council, which does not requiring legislative confirmation, and its membership cannot include any elected representatives (since 2009 reorganization). **No other comparator city has a board fully appointed by the government with no open screening or approval process. More significantly, the City of Toronto has no representation on the Metrolinx Board whatsoever.**

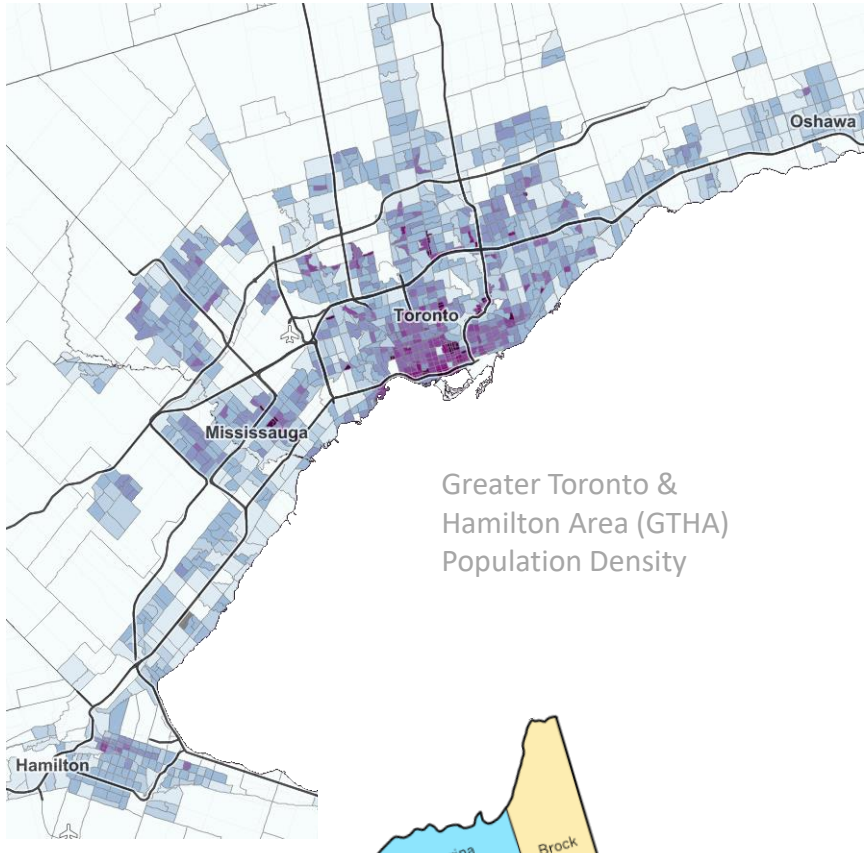
The TTC's Board of Commissioners is also somewhat unusual for having City Councillors as a strong majority of its members (one as Chair), and a limited role for civilian members. Civilian members are required to hold "executive-level" and "management" experience, but not necessarily any transit knowledge or experience. Council approves the membership of the Board, but its Councillor members are chosen by the mayor.

Other comparator city Boards seek some representation of diverse stakeholders and/or members with expertise and experience related to transit and transportation. Only one city includes both rider and ParaTransit representation by law.

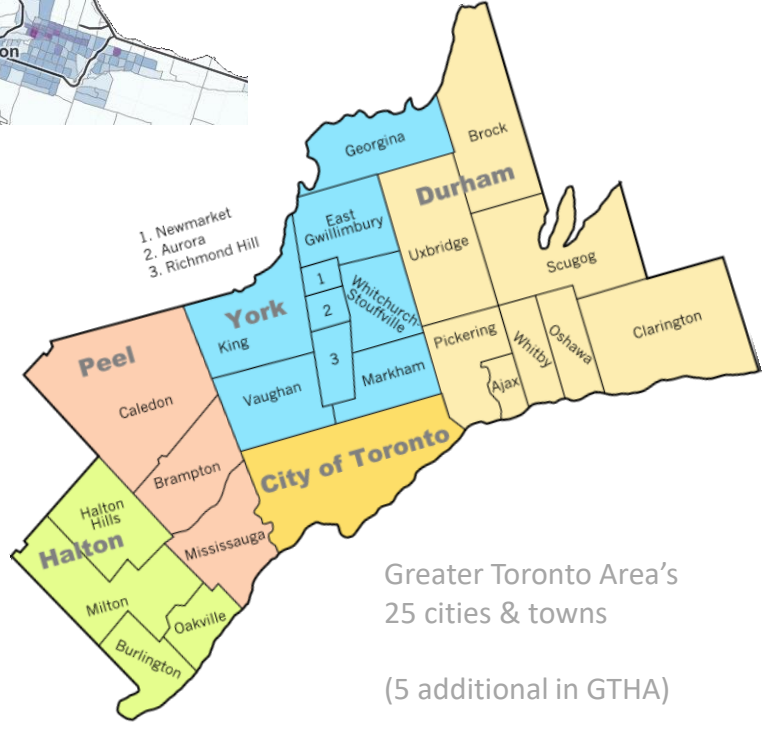
Appointments of elected representatives are included as one way of representing the different geographic stakeholders in a region. In the US, appointments are often subject to counter-checking, where the city's choices must be approved by the state, and vice versa. **In only one city, Boston, does the province or state have majority control over the network.**

Both Boards overseeing transit in Toronto are significantly politicized and vulnerable to partisan interference, to a degree not seen in other cities. When combined with inadequate and insecure funding, the vulnerability of the TTC is particularly acute.

Toronto



Greater Toronto & Hamilton Area (GTHA) Population Density



Greater Toronto Area's 25 cities & towns

(5 additional in GTHA)

Jurisdictions

City of Toronto

Province of Ontario

Boards

Toronto Parking Authority Board
2 Elected City Council members, 5 citizen members

Toronto Transit Commission
7 Elected City Council members, 4 citizen members appointed by City Council

Metrolinx
14 unelected citizen members appointed by provincial cabinet

Modes

Parking
Bike Share

Wheel-Trans, Bus, Streetcar, Subway

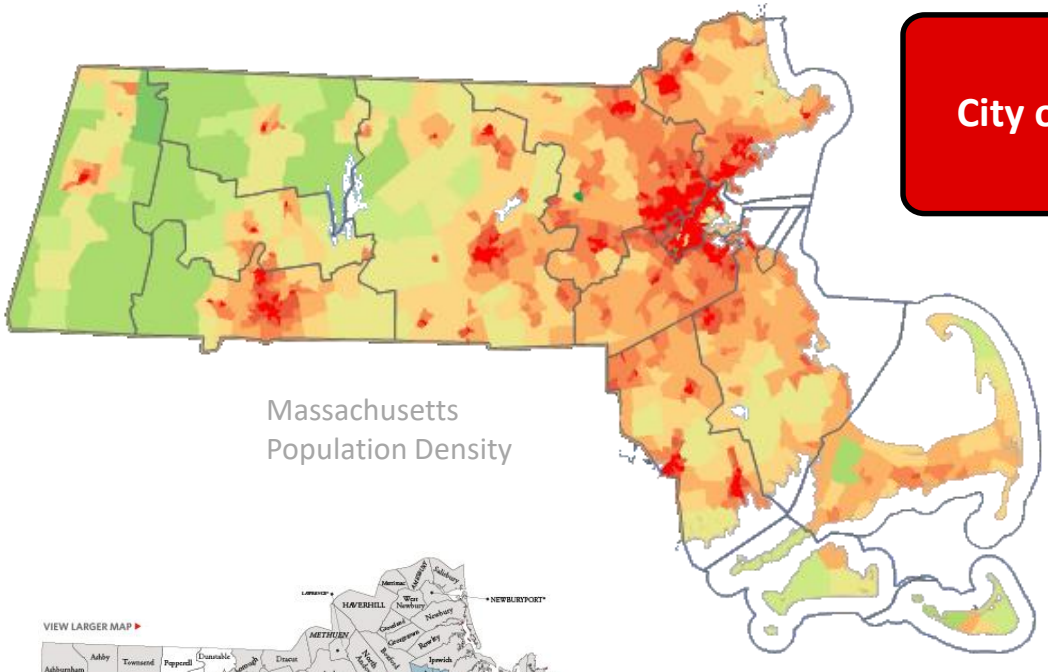
Future LRT

GO Transit, UP Express

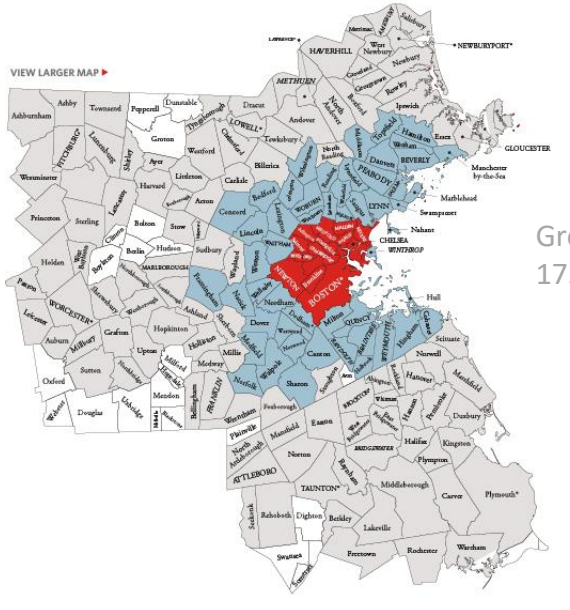
PRESTO fare card

Colour indicates majority control of transportation mode

Boston



Massachusetts
Population Density



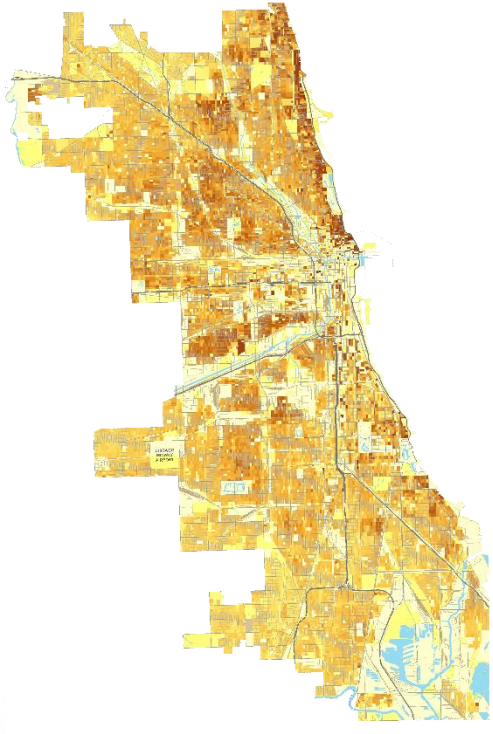
Greater Boston's
175 cities & towns

City of Boston	**Commonwealth of Massachusetts**			Jurisdictions
	MassDOT Board of Directors 11 citizen members appointed by Governor of MA	**MBTA Fiscal and Mgmt Control Board** 5 members appointed by Governor of MA	**MBTA Advisory Board** 175 members appointed by chief elected official of each city and town in the district	Boards
	Massachusetts Bay Transportation Authority			
Bike Share	**Parking, ParaTransit, Bus, Ferry, Subway, Commuter Rail**	**CharlieCard Fare Card**		Modes

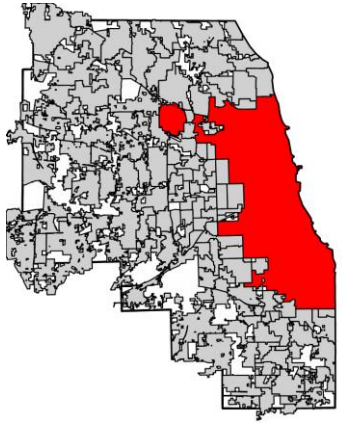
Colour indicates majority control of transportation mode

Chicago

Illinois



City of Chicago
Population Density



Greater Chicago's
126 cities & towns

Jurisdictions

Governor of Illinois	Mayor of Chicago	Cook County Board	Cook County Board President	"Collar Counties" Board Chairs

Regional Transportation Authority Board
16 members total, 5 appointed by the Mayor of Chicago, 4 by the Cook County Board, 1 by the Cook County Board President, 5 by the "Collar Counties" Board Chairs (1 each), and 1 elected by a super-majority of Board members

Boards

Pace Board of Directors 13 members total, 12 appointed by Collar Counties Board Chairs and the Suburban members of the Cook County Board (1 each), and 1 by the Mayor of Chicago. Chair appointed by majority vote of all except the Mayor	**Chicago Transit Authority Board of Directors** 7 members total, 4 appointed by Mayor of Chicago, and 3 by the Governor of Illinois	**Metra Board of Directors** 11 members total, 1 appointed by Mayor of Chicago, 4 by the Cook County Board, 1 by the Cook County Board President, and 5 by the Collar Counties Board Chairs (1 each)

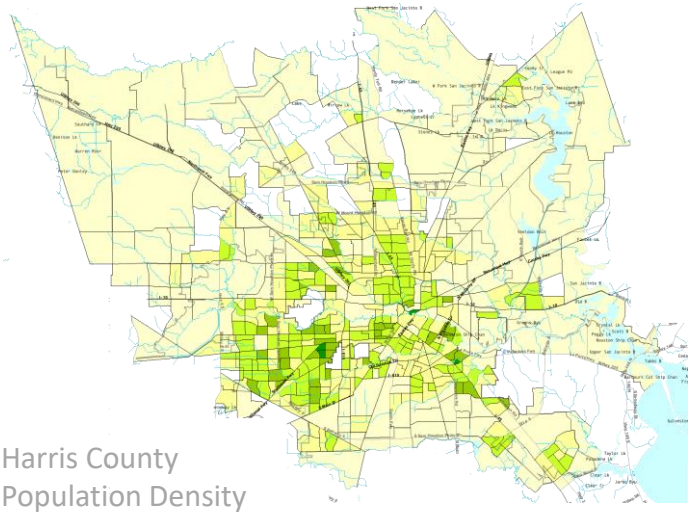
Modes

Divvy Bike Share	**ParaTransit, Suburban Bus, Vanpool**	**Parking, Bus, Elevated Trains, Ventra Fare Card**	**Commuter Rail**

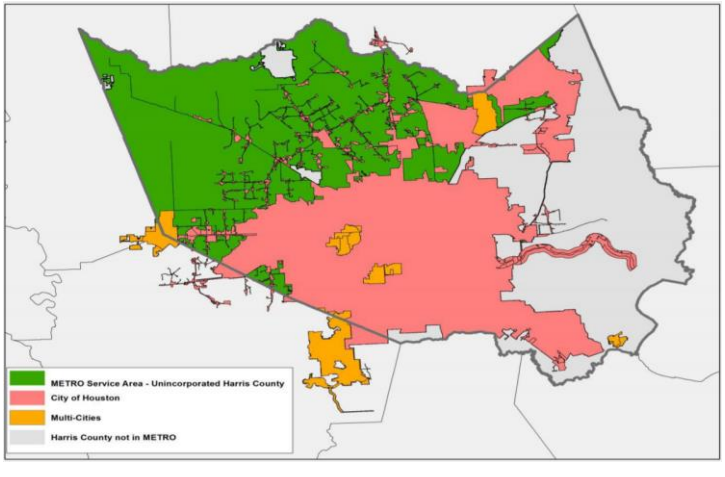
Colour indicates majority control of transportation mode

Houston

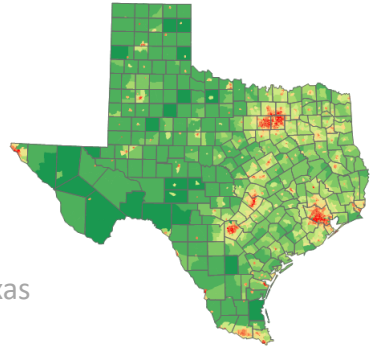
METRO



Harris County
Population Density



Harris County's 23 cities & towns



Texas

Jurisdictions

- **City of Houston**
- **Harris County Commissioners Court**
- **14 Multi-Cities in METRO's Service Area**

Boards

Metropolitan Transit Authority of Harris County

9 members total, 5 appointed by City of Houston, 2 by Harris County Commissioners Court, and 2 by the 14 Multi-Cities in METRO Service Area

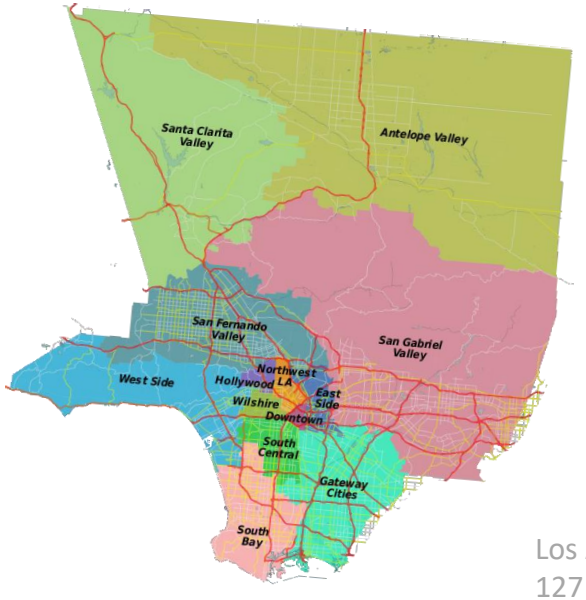
Modes

Parking, ParaTransit, Bus, Light Rail, Q Fare Card

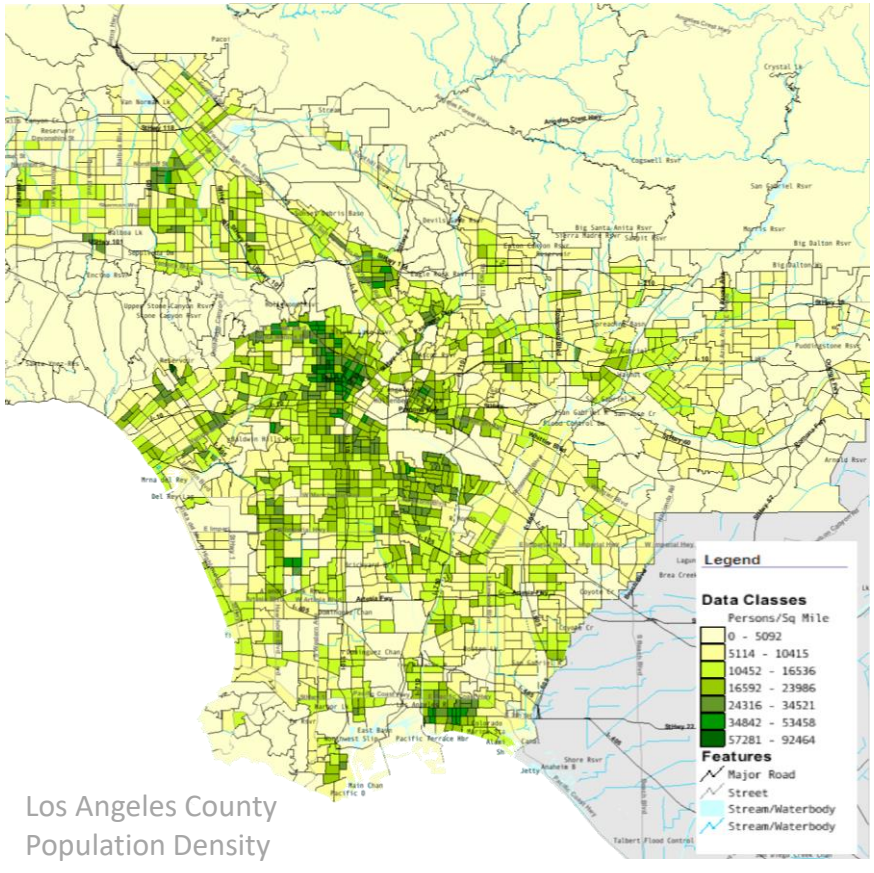
Colour indicates majority control of transportation mode

Los Angeles

Metro



Los Angeles County's
127 cities & towns



Los Angeles County
Population Density

Jurisdictions

Governor of California	Mayor of Los Angeles	Los Angeles County's 87 Member Cities	Los Angeles County	Orange County	Riverside County	San Bernardino County	Ventura County

Boards

Los Angeles County Metropolitan Transportation Authority Board
14 members total, 5 LA County Supervisors, the Mayor of LA and 3 appointees, and 4 council members of LA County member cities other than LA itself, and the 14th non-voting member by the Governor of California

Southern California Regional Rail Authority Board
11 members total, 4 appointed by Southern California Regional Rail Authority, 2 by Orange County, 2 by Riverside County, 2 by San Bernadino County, and 1 by Ventura County

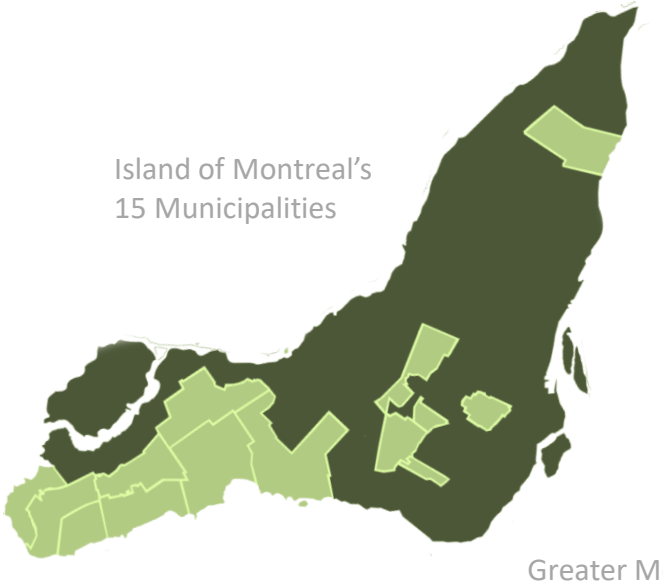
Modes

Bike Share, Bike Paths, Carpool Lanes, Freeway Car Service, Parking, Bus, Light Rail, Subway, TAP Fare Card

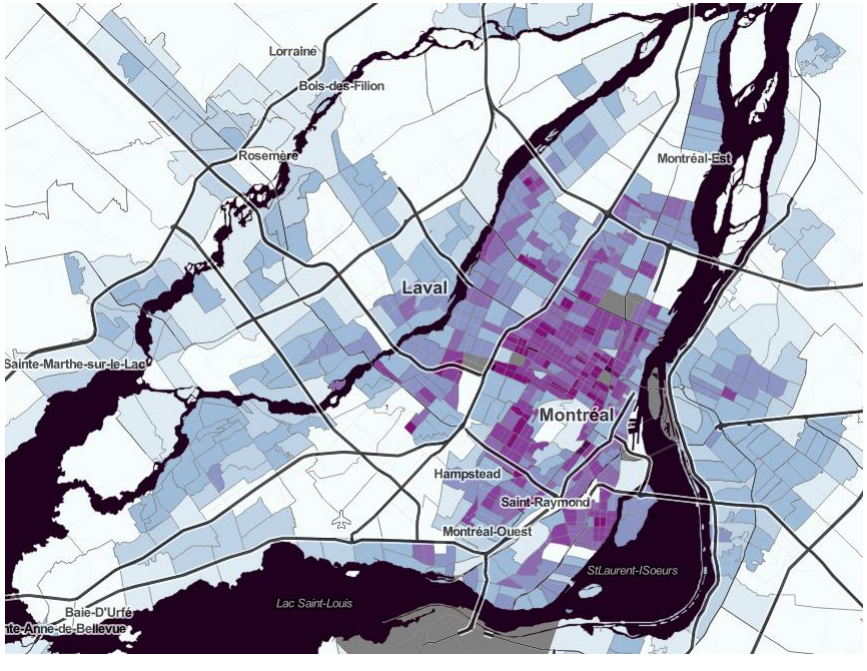
Commuter Rail

Colour indicates majority control of transportation mode

Montreal



Greater Montreal
Population Density

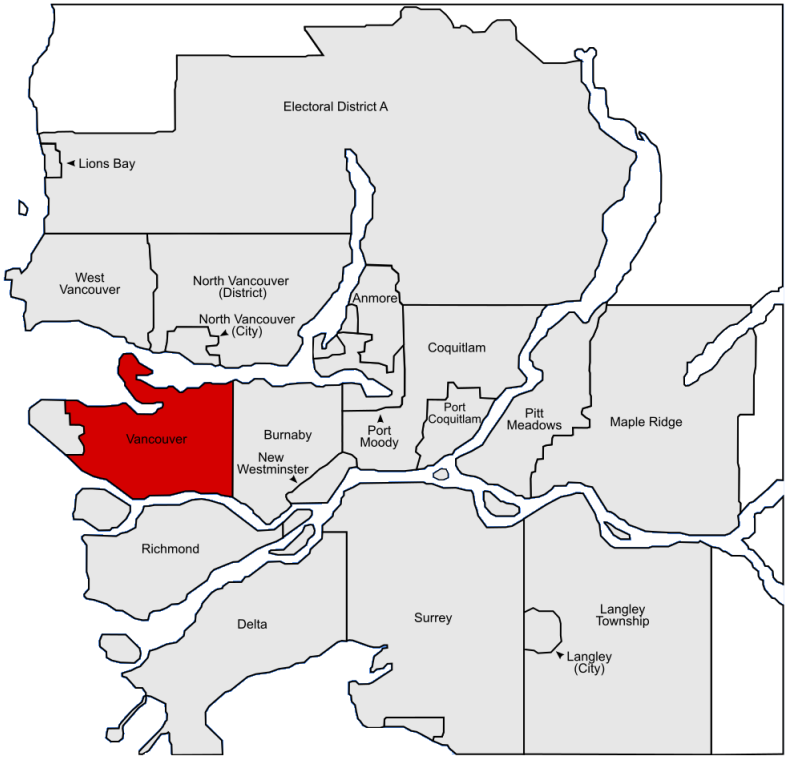


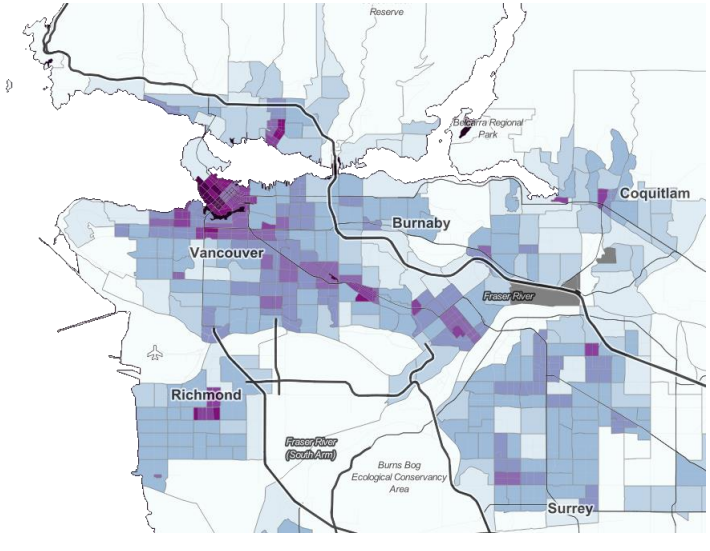
Jurisdictions	Boards	Modes
Montréal Agglomeration Council	**Société de transport de Montréal Board of Directors** 7-10 members appointed by the City of Montréal from its council and the councils of the urban agglomeration (up to 7 members), 1 ParaTransit representative, and 2 rider representatives, 1 of whom must be under age 35.	**Taxibus, ParaTransit, Parking, Bus, Subway, OPUS Fare Card**
Communauté métropolitaine de Montréal	**Réseau de transport métropolitain Board of Directors** 15 members total, 4 appointed by Greater Montreal's council (including one rider and one ParaTransit representative), 2 by the Island of Montreal regional council, 1 by Longueuil council, 1 by Laval council, and the 8 mayors of cities on the North (4) and South (4) shores	**Commuter Rail**
Agglomération de Longueuil		
Ville de Laval		
North Shore		
South Shore		

Colour indicates majority control of transportation mode

Vancouver

TRANS LINK





Greater Vancouver's 21 Municipalities, Electoral Area, and the Tsawwassen First Nation (above), and Population Density (left)

Jurisdictions

City of Vancouver

Mayors' Council

21 mayors of Metro Vancouver municipalities and the Chief of Tsawwassen First Nation

Boards

BC Minister of Transportation

Greater Vancouver Gateway Council

Chartered Accountants of BC

Vancouver Board of Trade

Screening Panel

5 members appointed by the five organizations above

South Coast British Columbia Transportation Authority ("Translink") Board of Directors

11 members appointed by the Mayors' Council from shortlist prepared by the Screening Panel

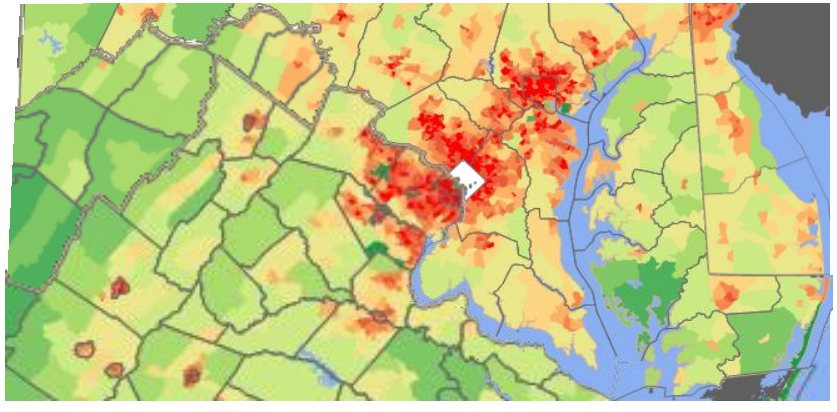
Modes

Bike Share

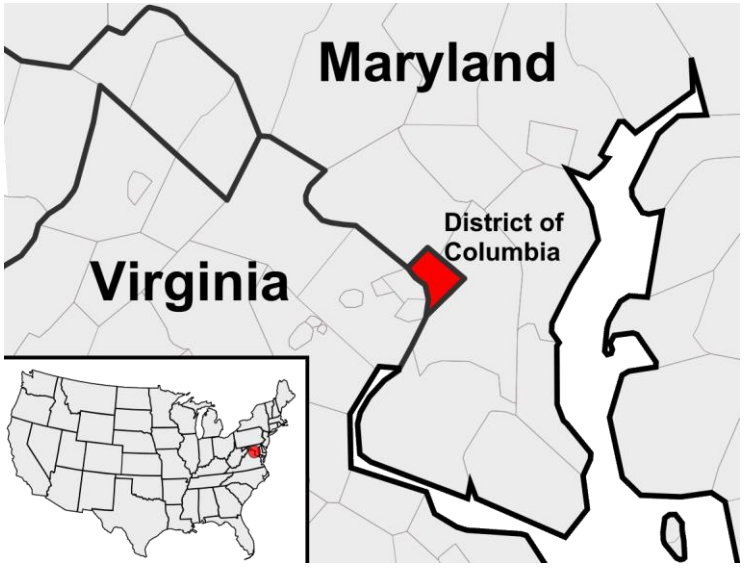
Parking, ParaTransit, Ferry, Bus, SkyTrain, Commuter Rail, Compass Fare Card

Colour indicates majority control of transportation mode

Washington, D.C.



Population Density in the District of Columbia and its neighbor states of Delaware, Maryland, and Virginia



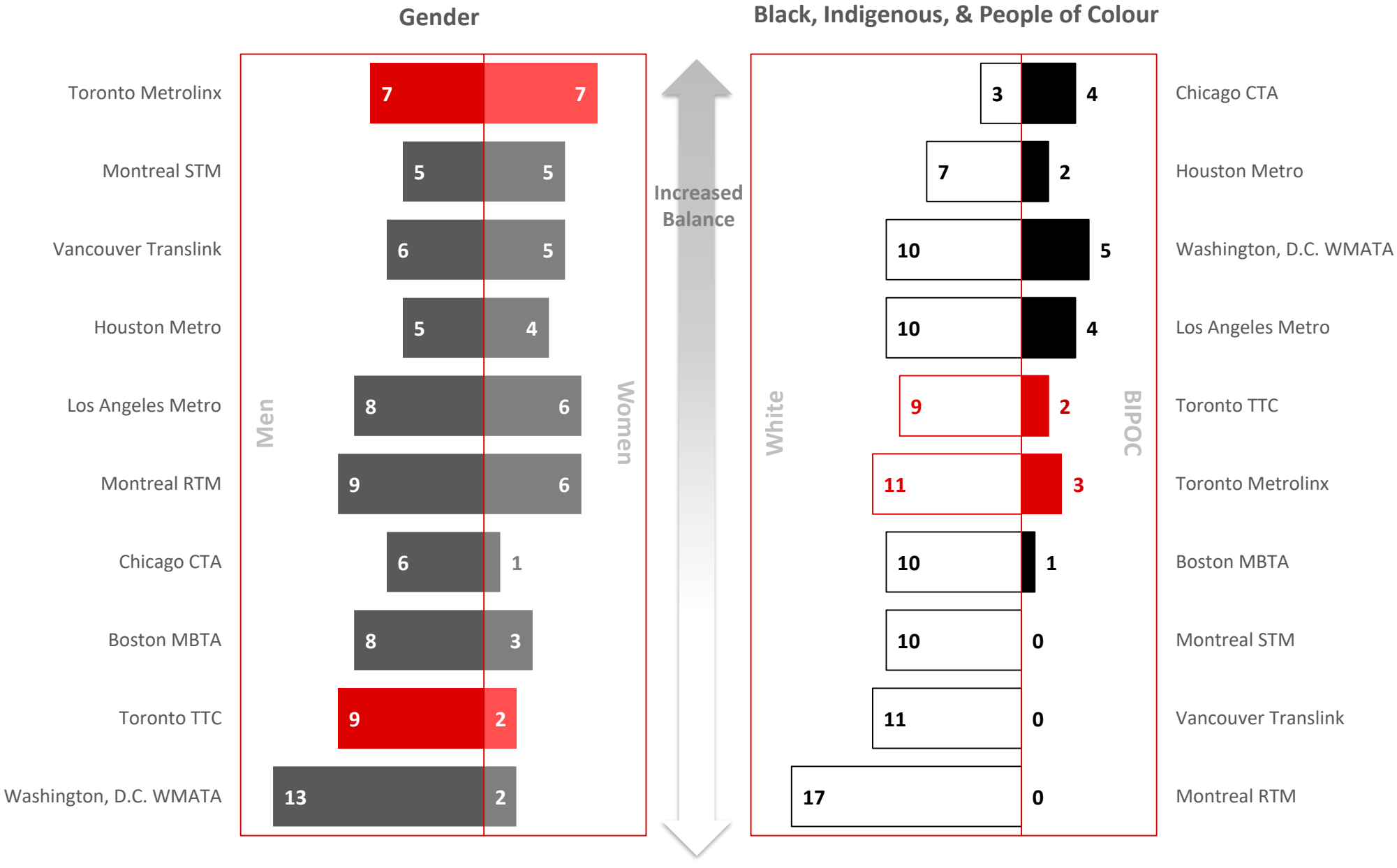
Jurisdictions	Arlington County VA	Alexandria VA	Fairfax County VA	Montgomery County MD	Council of the District of Columbia	Northern Virginia Transportation Commission (Virginia)	Washington Suburban Transit Commission (Maryland)	United States Secretary of Transportation
Boards	Capital Bikeshare	**Washington Metropolitan Area Transit Authority Board of Directors** 16 members (8 voting, 8 alternate) total, with 4 appointed by Council of the District of Columbia, 4 by Northern Virginia Transportation Commission, 4 by Washington Suburban Transit Commission, and 4 by United States Secretary of Transportation						
Modes	**Bike Share**	**Parking, ParaTransit, Bus, Subway, SmarTrip Fare Card**						

Colour indicates majority control of transportation mode

Local Agency Boards of Directors Membership & Control

	Percentage of Local Agency Board from Local Core City	Local Agency Board Members Representing… City	Region /County	Province /State	Federal Govt.	Privatized Agency at any level?	Rider representative on the Board?	ParaTransit representative on the Board?	Unelected Board members paid?
Toronto	100%	■	□	□	□	□	□	□	■
Boston	0%	□	□	■	□	□	□	□	□
Chicago	31%	■	■	■	□	□	□	□	■
Houston	56%	■	■	□	□	□	□	□	◪
Los Angeles	31%	■	■	□	□	□	□	□	■
Montreal	100%	■	■	□	□	□	■	■	■
Vancouver	5%	■	□	□	□	□	□	□	■
Washington, D.C.	25%	■	■	■	■	□	■	□	□

Boards of Directors and Equity



Fares

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City/Region	Source(s)
Toronto	TTC www.TTC.ca GO Transit www.gotransit.com Provincial Inflation http://inflationcalculator.ca/ontario/ Fare History https://transit.toronto.on.ca/spare/0021.shtml
Boston	MBTA www.MBTA.com Local Inflation https://www.bls.gov/regions/new-england/data/consumerpriceindex_boston_table.htm Fare History http://beta.metrobostondatacommon.org/site_media/uploads/DataDay2012_Pollack-The_State_of_MBTA_Finances.pdf
Chicago	CTA www.transitChicago.com Metra www.metrarail.com Local Inflation https://www.bls.gov/regions/midwest/data/consumerpriceindexhistorical_chicago_table.pdf Fare History https://www.chicagorailfan.com/fares.html
Houston	Metro www.rideMetro.org Local Inflation https://www.bls.gov/regions/southwest/data/consumerpriceindexhistorical_houston1967_table.pdf Fare History https://www.capmetro.org/uploadedFiles/Capmetroorg/Plans_and_Progress/Fare_Change/farestudy%20final%20draft.pdf
Los Angeles	Metro www.metro.net Metrolink www.metrolinktrains.com Local Inflation https://www.bls.gov/regions/west/data/consumerpriceindex_losangeles_table.pdf Fare History https://socata.net/newsletter/transit-avocate-1992-1999/ http://humantransit.org/2010/03/los-angeles-times-columnist-slams-transfer-penalties.html https://www.metro.net/news/simple_pr/metro-fare-changes-be-implemented-september-15-off/
Montreal	STM www.stm.info Exo (formerly AMT/RTM) https://rtm.quebec Provincial Inflation http://inflationcalculator.ca/quebec/ Fare History http://www.stm.info/en/about/financial_and_corporate_information/budget-and-reports/budgets-stm
Vancouver	Translink www.translink.ca Provincial Inflation http://inflationcalculator.ca/british-columbia/ Fare History https://www.translink.ca/-/media/Documents/rider_guide/Buzzer%20Vault/1990s/1997/Buzzer_1997_09_19.pdf http://www.cbc.ca/bc/news/bc-080723-Fare-Evasion-pwc.pdf https://www.huffingtonpost.ca/2012/11/13/translink-fare-increase_n_2126829.html http://dailyhive.com/vancouver/translink-fares-increase-july-1-2018 https://www.cbc.ca/news/canada/british-columbia/transit-fares-hit-5-in-metro-vancouver-1.726003 https://www.policyalternatives.ca/sites/default/files/uploads/publications/BC_Office_Pubs/bc_2007/bc_transit_btn.pdf
Washington, D.C.	WMATA www.wmata.com MARC https://mta.maryland.gov/marc-train VRE https://www.vre.org/ Local Inflation https://www.bls.gov/regions/mid-atlantic/dc_washington_md.htm Fare History https://www.wmata.com/about/records/public_docs/upload/History-of-Fare-Increases-FY2015.pdf
	Canada Inflation Calculator: https://www.bankofcanada.ca/rates/related/inflation-calculator/ **US Inflation Calculator:** https://www.usinflationcalculator.com/ **Farebox Recovery Ratio:** https://en.wikipedia.org/wiki/Farebox_recovery_ratio https://cms.fta.dot.gov/sites/fta.dot.gov/files/docs/ntd/66026/top-50-summary-and-complete-profile-set_1.pdf

Networks

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City/Region	Source(s)
Toronto	TTC www.TTC.ca GO Transit www.gotransit.com Maps: Streetcar/Subway https://www.ttc.ca/Routes/General_Information/Maps/index.jsp GO Transit https://www.gotransit.com/en/trip-planning/system-and-route-map Operating Statistics https://www.ttc.ca/About_the_TTC/Operating_Statistics/2016/section_one.jsp Corporate Plan 2018-2022 http://ttc.ca/About_the_TTC/Commission_reports_and_information/Commission_meetings/2018/January_25/Reports/1_Corporate_Plan_2018-2022.pdf
Boston	MBTA www.MBTA.com Maps: Subway https://www.mbta.com/schedules/subway Rail https://www.mbta.com/schedules/commuter-rail Expansion https://www.boston.com/news/local-news/2017/12/20/mbta-changes
Chicago	CTA www.transitChicago.com Metra www.metrarail.com Maps: L Metra
Houston	Metro www.rideMetro.org Map: https://www.ridemetro.org/Pages/SchedulesBusRail.aspx
Los Angeles	Metro www.metro.net Metrolink www.metrolinktrains.com Map: https://www.metro.net/riding/maps/ Expansion https://www.metro.net/projects/crenshaw_corridor/
Montreal	STM www.stm.info Exo (formerly AMT/RTM) https://rtm.quebec Maps: STM exo
Vancouver	Translink www.translink.ca Maps: SkyTrain https://www.translink.ca/Schedules-and-Maps/Transit-System-Maps.aspx West Coast Express https://www.translink.ca/Schedules-and-Maps/West-Coast-Express/WCE-Station-Maps.aspx
Washington, D.C.	WMATA www.wmata.com MARC https://mta.maryland.gov/marc-train VRE https://www.vre.org/ MetroAccess https://www.wmata.com/service/accessibility/metro-access/
	Additional network details: UrbanRail.net **Ridership:** American Public Transportation Association Q4 2017 Ridership Report **Mode Share:** Streetsblog, Statistics Canada

Budgets

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City/Region	Source(s)
Toronto	TTC www.ttc.ca 2017-2018 TTC & Wheel-Trans Operating Budgets https://www.ttc.ca/About_the_TTC/Commission_reports_and_information/Committee_meetings/Budget/2017/November_17/Reports/1_2018_TTC_and_Wheel-Trans_Operating_Budgets.pdf https://www.toronto.ca/legdocs/mmis/2017/ex/bgrd/backgroundfile-100738.pdf
Boston	MBTA www.mbta.com 2017 Fiscal Year Audited Financial Statements https://d3044s2alrsxog.cloudfront.net/sites/default/files/2017-12/fy17-audited-financial-statements.pdf
Chicago	CTA www.transitchicago.com 2017 Fiscal Year Budget Book http://www.transitchicago.com/assets/1/finance_budget/FY17_Budget_Book_FINAL.pdf
Houston	Metro www.ridemetro.org Comprehensive Annual Financial Report 2016 https://www.ridemetro.org/MetroPDFs/FinancialAuditInformation/2017/FY2016-CAFR.pdf
Los Angeles	Metro www.metro.net 2018 Fiscal Year Proposed Budget https://media.metro.net/about_us/finance/images/fy18_proposed_budget_2017-05.pdf
Montreal	STM http://stm.info 2016 Annual Report http://www.stm.info/sites/default/files/affairespubliques/Communiques/stm_rapport_annuel_2016_final.pdf
Vancouver	Translink www.translink.ca 2017 Business Plan and Operating and Capital Budget https://www.translink.ca/-/media/Documents/about_translink/corporate_overview/corporate_reports/business_plan/2017_business_plan_and_operating_and_capital_budget.pdf
Washington, D.C.	WMATA www.wmata.com 2018 Approved Budget https://www.wmata.com/about/records/public_docs/upload/Approved-Budget-Final_v1.pdf
	Sankey Flow Diagrams: www.sankeymatic.com **Subsidy per Rider:** 2017 TTC and Wheel-Trans Operating Budgets, Watchdog.org **Revenue Sources:** file:///C:/Users/cameron.macleod/Downloads/Dedicated%20Revenue%20Sources%20for%20Major%20Transit%20Agencies.pdf **Revenue Recommendations:** https://www.toronto.ca/legdocs/mmis/2014/ex/bgrd/backgroundfile-67455.pdf http://www.occ.ca/Publications/The-2Billion-Question_online.pdf https://www.policyalternatives.ca/sites/default/files/uploads/publications/Ontario%20Office/2013/05/Torontos_2andHalf_Billion_Dollar_Question.pdf http://www.metrolinx.com/en/regionalplanning/funding/investment_strategy.aspx

Governance

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City/Region	Source(s)
Toronto	TTC Board https://www.ttc.ca/About_the_TTC/Commission_reports_and_information/index.jsp Metrolinx http://www.metrolinx.com/en/aboutus/board/board_of_directors_bios.aspx Ontario Ministry of Transportation https://www.ontario.ca/page/ministry-transportation Region https://commons.wikimedia.org/wiki/File:Greater_toronto_area_map.svg Density https://censusmapper.ca/maps/591#10/43.5789/-79.4888
Boston	MBTA Fiscal and Management Control Board (FMCB) https://www.mbta.com/leadership/fmcb MBTA Advisory Board http://www.mbtaadvisoryboard.org Massachussetts Department of Transportation (MassDOT) https://www.mass.gov/orgs/massachusetts-department-of-transportation Region http://www.mbtaadvisoryboard.org/about-us/ Density https://en.wikipedia.org/wiki/Demographics_of_Massachusetts
Chicago	Chicago Transit Board https://www.transitchicago.com/board/ Metra Rail Board of Directors https://metrarail.com/about-metra/leadership Region https://en.wikipedia.org/wiki/Cook_County,_Illinois Density https://www.flickr.com/photos/mindfrieze/4037618743 https://en.wikipedia.org/wiki/Chicago
Houston	Metro Board https://www.ridemetro.org/Pages/BoardOfDirectors.aspx Region https://commons.wikimedia.org/wiki/File:Map_of_Texas_highlighting_Harris_County.svg https://www.houstontx.gov/controller/investorrelations/2017invconf/metro.pdf Density https://en.wikipedia.org/wiki/Demographics_of_Texas https://commons.wikimedia.org/wiki/File:Houstonpopulationdensity.PNG
Los Angeles	Metro Board https://www.metro.net/about/board/ Metrolink Board https://www.metrolinktrains.com/about/agency/board-of-directors/ Region https://commons.wikimedia.org/wiki/File:LA_districts_map.svg Density https://commons.wikimedia.org/wiki/File:LACountyPopDensity.png
Montreal	Société de transport de Montréal Board of Directors (English link) http://www.stm.info/en/about/corporate-governance/board-directors Exo Governance (French link) https://rtm.quebec/fr/a-propos/gouvernance Region https://fr.wikipedia.org/wiki/Montr%C3%A9al Density https://censusmapper.ca/maps/591#11/45.5470/-73.6019
Vancouver	Translink Governance https://www.translink.ca/About-Us/Governance-and-Board.aspx Region https://en.wikipedia.org/wiki/Vancouver Density https://censusmapper.ca/maps/591#11/49.2756/-123.1155
Washington, D.C.	WMATA Board of Directors https://www.wmata.com/about/board/ MARC https://mta.maryland.gov/about-mta VRE https://www.vre.org/about/board/ Region https://commons.wikimedia.org/wiki/File:Washington,_D.C._locator_map.svg Density https://commons.wikimedia.org/wiki/File:Virginia_population_map.png https://commons.wikimedia.org/wiki/File:Maryland_population_map.png https://commons.wikimedia.org/wiki/File:West_Virginia_population_map.png https://commons.wikimedia.org/wiki/File:Delaware_population_map.png

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