Light Rail Transit

Transforming Transit for Riders and Communities

KEOLIS

A Blueprint for Cities

Dubbed a **Transit Watershed**, Ontario's Ion LRT Exemplifies Modern Transportation.

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In this paper, we will show how Keolis can contribute to planning, building/rehabilitation, operation, and ongoing maintenance for our partners around the globe. We will also focus on establishing best practices and developing strategies to build and enhance sustainable mobility networks built for the infrastructure needs of today and tomorrow.

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At-a-Glance

aBRT	Adapted Bus Rapid Transit
APTA	American Public Transportation Association
EA	Environmental Assessment
GRT	Grand River Transit system
ION	The Ion Network (named for the atom, meaning *always in motion)*
LRT	Light Rail Transit
LRV	Light Rail Vehicles
SOV	Single-Occupy Vehicles
TNC	Transportation Network Companies
TOD	Transit-Oriented Development

INTRODUCTION

Investment in travel is an investment in yourself.

Matthew Karsten
American military leader ExpertVagabond.com

Walk through any city in the U.S. and likely it will look and feel very different than it did 20 years ago. Sparking these changes are multiple cultural shifts, unprecedented economic periods and the adoption of an unyielding series of digital innovations. Everyone from commuters to civil engineers have come to view urban life and mobility in radically new ways since the start of the 21st century.

Way before writer Sarah Stankorb coined the term **Xennial** in September 2014, college graduates in the late 1990s sparked a major urban revival as they moved to cities with mass transportation, parks, and access to entertainment.

Rejecting the suburban lifestyle that their parents embraced, from 2000 to 2010, more young professionals aged 25 to 34 moved downtown than to the suburbs in 39 of the 50 largest U.S. metros. For 35-to-44-year-olds, the same held true in 28 of the 50 largest metros (Bloomberg, 2016). The movement originated in larger cities, like New York or San Francisco, but as Millennials joined the workforce, they brought these same preferences to smaller markets, like Cleveland and Baltimore.

MOBILITY PREFERENCES

As with any cultural shift, there is ample opportunity for researchers to measure opportunities and for leaders of various industries to adapt and engage these consumers. Specific to mobility, what emerged was a marked preference for trains, and when compared to bus rapid transit (BRT), specifically, light rail transit (LRT) among public transit consumers.

In a 2015 University of Sydney study, **nearly three quarters of respondents preferred modern or older train lines to buses.** Six years earlier, extensive consumer focus groups conducted in Los Angeles by the Department of Transportation (DOT) in 2009 looked at themes of **shame** and **congestion** often associated with bus travel contrasting with the success of the 2005 launch of the **Orange Line**, a BRT with dedicated lanes. Due in large part to extensive marketing, researchers found qualitative evidence that LA riders associated the line more with an LRT—dubbing it a **train-bus**—and comparing the experience to using the New York City subway.

THE BRT REPORTED
25K RIDERS/DAILY

MORE THAN
3X
INITIAL ESTIMATES IN 2017

IN ADDITION TO PREFERRING THE AESTHETIC OF TRAINS TO BUSES, OTHER FACTORS ADD WEIGHT TO THE PERCEIVED VALUE OF TRAINS:

- Creates sense of permanence
- Sparks regional development
- Reduces road congestion, loss of privacy and flexibility of cars
- Overcomes unsafe perceptions associated with buses
- Enhances sense of innovation with dedicated lanes, updated technology, ease

BENEFITS OF LRT

Technology is best when it brings people together.

Matt Mullenweg
American entrepreneur and web developer

Trolleys and streetcars are ubiquitous symbols of many North American cities, like San Francisco, New Orleans, and Toronto. Collectively, trams or above ground trains, sit at the sweet spot between buses and trains.

There are many reasons to embrace and continue this legacy. The introduction of light rail transit systems worldwide have repeatedly been shown to have positive impacts on land use, mobility, inclusive access, and shaping future growth—all while minimizing the environmental impacts of Single-Occupancy Vehicles (SOV)s. Carefully planned Transit-Oriented Development (TOD) adjacent to LRT stations can concentrate activity centers, intensify density, and attract private sector investment in mixed-use projects that combine residential, commercial, educational, and recreational destinations.

Additionally, there is a colloquial case for North America's warm embrace of trains. Policies instituted to drive rapid development of railways in the nineteenth century fueled enthusiasm for local stations and westward expansion. **In 1972, the classic streetcar got a modern makeover resulting in the LRT (Gregory, 2003).** More recently, highly-publicized programs have steered public officials to cite federal dollar allocations for trains as an advantage for train or tram infrastructure.

Beyond public opinion, LRT systems offer seamless linkages to other modes, including buses, shuttles, trams, for-hire vehicles, and even micro-mobility such as scooters. Ultimately, this increases transit usage, reducing SOVs, and allowing communities to balance investments in roads and other automobile-centric infrastructure.

In addition to consumer perception and ecological efforts, investment in transportation such as LRTs results in **economic benefit** (property values and jobs), **congestion reduction**, and **growth management** in small to mid-sized DMAs.

FURTHER GOALS WITHIN THE LARGER INFRASTRUCTURE MOVEMENT

Economic

Equity and inclusion

Sustainability

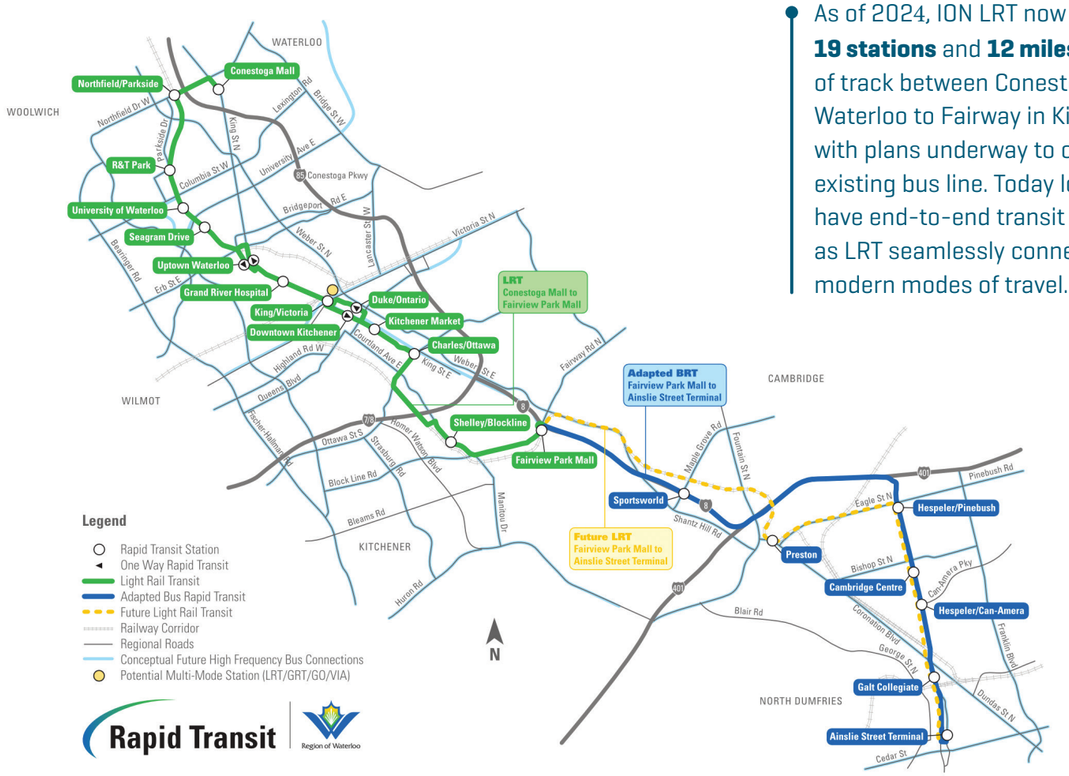
TRANSIT WATERSHED: DISCOVER ION LRT

When LRTs were first being developed in the late 1960s, many were ahead of their time. As communities embraced these networks, it quickly became apparent that LRT were the most effective way to meet and maintain green standards—offering untapped potential.

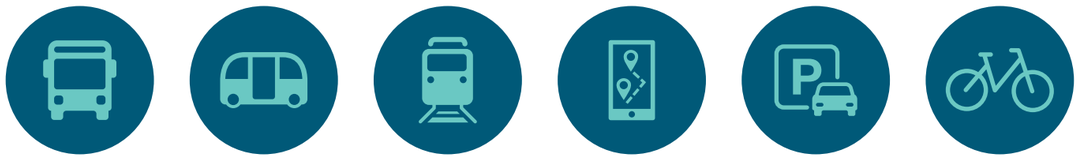
Mark Mendoza
Keolis North America

One of the networks influencing leaders around the world was specifically designed to meet many of the cultural, economic, and ecological demands that drive infrastructure investment today.

Celebrated as a *transit watershed*, **ION LRT** contributes to overall quality of life, reducing travel time and congestion, improving mobility options, reducing greenhouse emissions and revitalizing adjacent areas within the region of Waterloo, Ontario in Canada. It has become a model to emulate throughout North America.



As of 2024, ION LRT now links **19 stations** and **12 miles (19 km)** of track between Conestoga in Waterloo to Fairway in Kitchener with plans underway to convert the existing bus line. Today local riders have end-to-end transit options as LRT seamlessly connects to all modern modes of travel.



Service on the expanded network began in June 2019, offering enhanced services to historic downtown districts, shopping malls, and schools, (i.e., University of Waterloo.) Initial community response was positive due in large part to day-one commitment to the **THREE ESSENTIAL PILLARS:**

PILLAR ONE **Economic Goals**

Although some remain critical of the capital expenditures required to build and maintain LRT systems, a 2020 report by the American Public Transportation Association (APTA) outlines the economic benefit to property values, jobs, congestion, and growth management, which are realized in nearly every community where LRT operates.

Compellingly, onboard survey research indicates that in a scenario of increased public transportation investment—

of additional transit trips would shift from transportation network companies [TNC]

and

would shift from taxis

These metrics are shown to contribute to overall quality of life by reducing travel time and congestion, improving access to mobility options, reducing greenhouse emissions, and revitalizing areas adjacent to LRT stations.

SPECIFIC APTA FINDINGS SHOWCASE THE BENEFITS TO:

CONSUMERS

$11.7 BILLION SAVED annually in car operation costs by American drivers by 2040 (APTA 2020)

LOCAL MUNICIPALITIES

$16.2 BILLION WILL BE GENERATED ANNUALLY in federal, state and local tax revenue by 2040 as a result of APTA's recommendations (APTA 2020)

THE ECONOMY

2 MILLION JOBS will be created or sustained by 2040 as a result of recommendations by the APTA (2020)

In fact, the U.S. DOT reported in 2016 that impact by the end of the 20-year period would represent a ratio of approximately $5 billion of additional GDP per $1 billion invested annually. At current wage rates, this is equivalent to a ratio of approximately 49,700 jobs per $1 billion invested in public transportation.

PILLAR TWO **Equity and Inclusion Goals**

In addition to being a cost-effective option for many urban areas, LRT systems are easy to modify and typically require a lower level of care and maintenance. From an equity and inclusion perspective, LRT offers markets the opportunity to set a higher bar for expansion and increased ridership among communities living without previous access to mass transportation and schools and jobs located in city centers. Plus, investments in public transit can help people get better jobs and higher wages, and raise economic growth and productivity.

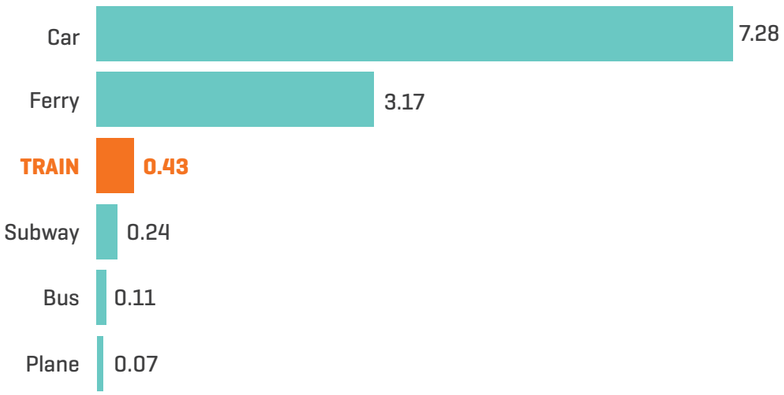
In a 2013 paper published in Urban Studies, Daniel Chatman from University of California at Berkeley and Robert Noland of Rutgers University report that hidden economic value of transit could be worth at a minimum of **$1.5 MILLION A YEAR,** depending on the size of the city. And, the bigger the city, the bigger the agglomeration benefit of expanding transit. A metropolitan area's **10 PERCENT** increase in transit seats or rail service miles per capita is associated with up to $1.8 billion per year in increased wages.

Similar to benefits associated with access to automobiles, multiple studies continue to validate that improved transit access increases labor force participation. A 2018 study by Stanford University found that geographic isolation, which is measured by lengthy commute times, was a significant factor in reducing rates of poverty. The authors concluded that upward mobility is higher in cities with limited sprawl and further fostered by universal access to reliable, affordable transportation.

Plus, LRTs are statistically found to be incredibly safe, overcoming common barriers reported by riders. A survey of former riders conducted by LA Metro in 2016 found that **29 PERCENT CITED PERSONAL SAFETY CONCERNS** as the primary reason they stopped taking transit, even though incident data significantly favors public transportation on buses, trains, and even planes over SOVs. **Automobiles are the most deadly ways to get from Point A to Point B** according to a 2015 report by Northwestern economist, Ian Savage and reflected in this *Washington Post* graph.

IT'S REALLY SAFE TO TAKE THE TRAIN

Passenger deaths per 1 billion passenger miles, 2000 to 2009



Source: Ian Savage, Northwestern University
WAPO.ST/WONKBLOG

For every billion passenger miles, **AUTOMOBILES ACCOUNT FOR 7.28 DEATHS**.This fatality rate was **17x AS HIGH AS THE RATE FOR TRAINS,** which stood at 0.43 deaths per billion miles.

PILLAR THREE **Sustainability Goals**

SUSTAINABILITY AND BUILDING INFRASTRUCTURE TO WITHSTAND CLIMATE CHANGE, ARE CONTINUALLY REPORTED TO BE ISSUES OF IMPORTANCE TO THE PUBLIC.

A 2023 JOINT STUDY BY MCKINSEY AND NIELSENIQ FOUND THAT

of U.S. consumers say that a sustainable lifestyle is important to them.

THE EPA ESTIMATES THAT OVER

of fuel used for transportation is petroleum based.

Every vehicle on the road releases an average of one pound of CO_2 per mile driven. Compared with driving alone, taking public transportation **reduces CO_2 emissions by 45 PERCENT,** decreasing pollutants in the atmosphere and improving air quality.

It's estimated that public transportation in the U.S. saves **37 MILLION METRIC TONS** of carbon dioxide annually.

INCLUSIVE OF CLEARER SKIES AND LESS AIR POLLUTION, PUBLIC TRANSPORTATION LIKE LRTS CAN:

- Promote healthier communities
- Reduce reliance on harmful chemicals
- Decrease ground and water pollution prolonged by dependance on roads
- Limit noise pollution

Additionally, investment in sustainable infrastructure ensures mobility from an integrated network and encourages more compact urban form—protecting sensitive environmental landscapes and high-quality farmlands. In 2019, **73 PERCENT** of all new housing was built in these densified areas. Therefore, enhanced infrastructure not only meets consumer demand for sustainable solutions, it improves quality of life for generations of professionals that opt to live in major markets.

PARTNERING WITH KEOLIS

If everyone is moving forward together, then success takes care of itself.

Henry Ford
American entrepreneur

Transportation is more than just getting from place to place—it's a dynamic ecosystem that shapes societies and economies.

Working closely with its partners, Keolis continues to contribute to planning, building/rehabilitation, operation, and ongoing maintenance by:

- Overseeing ION's 15 light rail vehicles (LRV)—single- and double-track alignments that run both on-street and in shared freight rail
- Maintaining service with 90 dedicated people
- Measuring and reporting safety Key Performance Indicators (KPI) in real time

Just Culture Safety Approach

Safety is not a matter of luck; it is an attitude. Keolis systematically focuses on a root cause analysis of safety issues, and we also take a *Just Culture* approach to safety—a best practice at Keolis worldwide. With the knowledge that employees will be treated fairly in the event of an error, there is little to no hesitation reporting near hits and similar incidents. *Just Culture* enables an iterative approach to training and corrective actions that minimize the likelihood of repeat incidents.

The benefit of this approach is shown by the operators in Waterloo. In May 2022, an internal Employee Survey measured that **81 PERCENT** of Keolis Grand River employees agreed or strongly agreed that safety was a priority for the company. Through multi-pronged efforts and implementation of an enhanced Safety Management System, data and key performance indicators were impressive for the Grand River Transit's ION LRT in 2022.

ON-TIME PERFORMANCE
(JUL 21—22)

MAINTENANCE PERFORMANCE FACTOR
over 12 months

MAINTENANCE OPERATIONAL PERFORMANCE FACTOR
2022

Service availability (trips delivered)

Service reliability (on-time performance)

PASSENGER INJURIES PER 10K TRAVELED
JUL 21–DEC 21

.04

JAN 22—JUN 22

.02

EMPLOYEE INJURIES PER 200K HOURS WORKED
JUL 21–DEC 21

.55

JAN 22–JUN 22

1.89

GLOBAL EXPERTISE, INNOVATIVE BRTs

While LRT in many ways is the gold standard of modern transportation, borrowing from many of the desired features, BRTs, like LA's **Orange Line**, continue to innovate and meet consumer demand. In fact, reframing the BRT experience from the consumer's perspective can be a bridge to network and ridership growth.

TRANSIT NETWORKS WITH TRAMS

MORE RIDERSHIP
than those with just buses

In the French city of Pau, Keolis operates a hydrogen-powered BRT network.

Most of this network operates on a dedicated route and the design of the bus features a rounded front and wheel coverings. This design makes the bus look more like a tram, an important feature for attracting ridership. Research has found prospective riders have an affinity for tram (aka streetcar or trolley) design.

In many ways ION LRT and other networks managed by Keolis worldwide offer a blueprint for cities to consider. As a global business, Keolis can help its partners employ these best practices as well as develop their own strategies to build and enhance sustainable mobility networks, built for infrastructure needs of today and tomorrow.

Contact Media@keolisna.com for Keolis North America to discuss specific needs and solutions.

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