



City of London Cycling Master Plan Review

Master Plan Review Working Group

Timeline of Key Events



A horizontal timeline bar with four segments for the years 2016, 2017, 2018, and 2019. The 2016 and 2018 segments are light blue, while the 2017 and 2019 segments are dark teal. Four key events are marked with vertical lines and dots: September 2016 (top left), April 23, 2019 (top right), May 16, 2017 (bottom left), and October 8, 2018 (bottom right). Each event includes a date in bold teal text and a description in grey text.

September 2016

Cycling Master Plan
(CMP) approved by
London Council

2016

2017

May 16, 2017

London adopts Vision Zero
Principles

2018

October 8, 2018

UN releases Special Report on
Global Warming of 1.5 °C
(SR15) declaring a 45%
reduction in CO₂ is required by
2030

April 23, 2019

London declares Climate
Emergency

2019

The Need to Review the CMP

Based on the timeline of events since the CMP was adopted, the CMP requires a detailed review based on:

→ Climate Emergency

Are the mode share targets upon which the CMP is based consistent with the need for 45% reduction in CO₂ emissions? If not, what mode split targets are required? Is the CMP consistent with achieving these targets?

→ Vision Zero

Is the CMP consistent with the Vision Zero principles that no loss of life is acceptable, that we all make mistakes, and that traffic fatalities and serious injuries are preventable and that eliminating them is a shared responsibility between road users and those that design/maintain them?

Climate Emergency

UN Special Report on Global Warming of 1.5°C (SR15)

- *Global net human-caused emissions of carbon dioxide (CO₂) would need to fall by about 45 percent from 2010 levels by 2030, reaching 'net zero' around 2050*

Canada's Changing Climate Report 2019

- *Both past and future warming in Canada is, on average, about double the magnitude of global warming*
- *Canada and the rest of the world reduce carbon emissions to near zero early in the second half of the century and reduce emissions of other greenhouse gases substantially*



City of London Statement on Climate Emergency

1. Acknowledgement of the Situation

Whereas climate change is currently contributing to billions of dollars in **property and infrastructure damage** worldwide, **stressing local and international economies**; Whereas climate change is currently **jeopardizing the health and survival** of many species and other natural environments worldwide, **stressing local and international eco systems**; Whereas climate change is currently harming human populations through **rising sea levels** and other extraordinary phenomena like **intense wildfires** worldwide, stressing local and international communities;

City of London Statement on Climate Emergency


2. The Need for Action

Whereas recent **international research** has indicated a need for **massive reduction in carbon emissions in the next 11 years** to avoid further and **devastating economic, ecological, and societal loss**; Whereas the climate in **Canada is warming at twice the rate of the rest of the world**, as per Canada's Changing Climate report; **Whereas current initiatives such as the green of the city's fleet and energy reduction initiatives are not sufficient to meet the targets as defined by the IPCC scientists**

City of London Statement on Climate Emergency

3. The Declaration of Climate Emergency

Whereas an emergency can be defined as "an often dangerous situation requiring immediate action"; Whereas municipalities such as Kingston, Vancouver and Hamilton have already declared climate emergencies; Therefore, **a climate emergency BE DECLARED by the City of London for the purposes of naming, framing, and deepening our commitment to protecting our economy, our eco systems, and our community from climate change.**

An aerial photograph of a city skyline, likely London, featuring various buildings and a prominent orange semi-transparent rectangle in the center. The rectangle contains white text. The background shows a mix of urban architecture, including a tall skyscraper in the distance and lower-rise buildings in the foreground.

**The City of London recognizes that
there exists a Climate Emergency
and that current initiatives are
insufficient to reach
scientifically-based emissions
targets.**

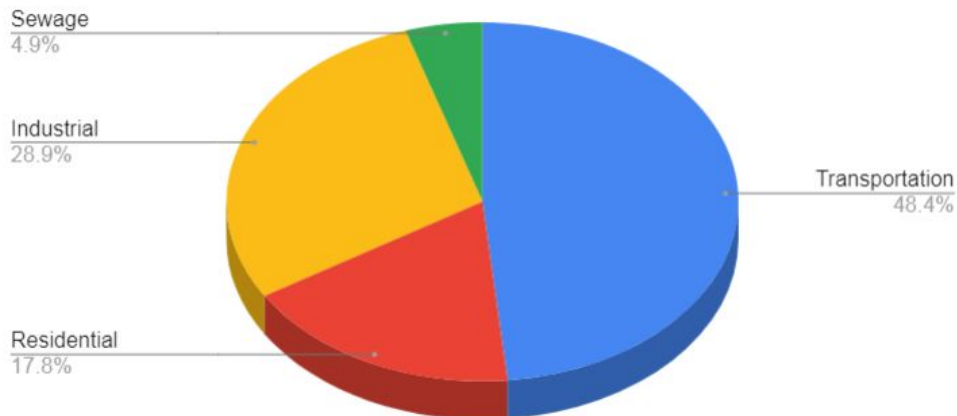
2017 Community Energy and Greenhouse Gas Report

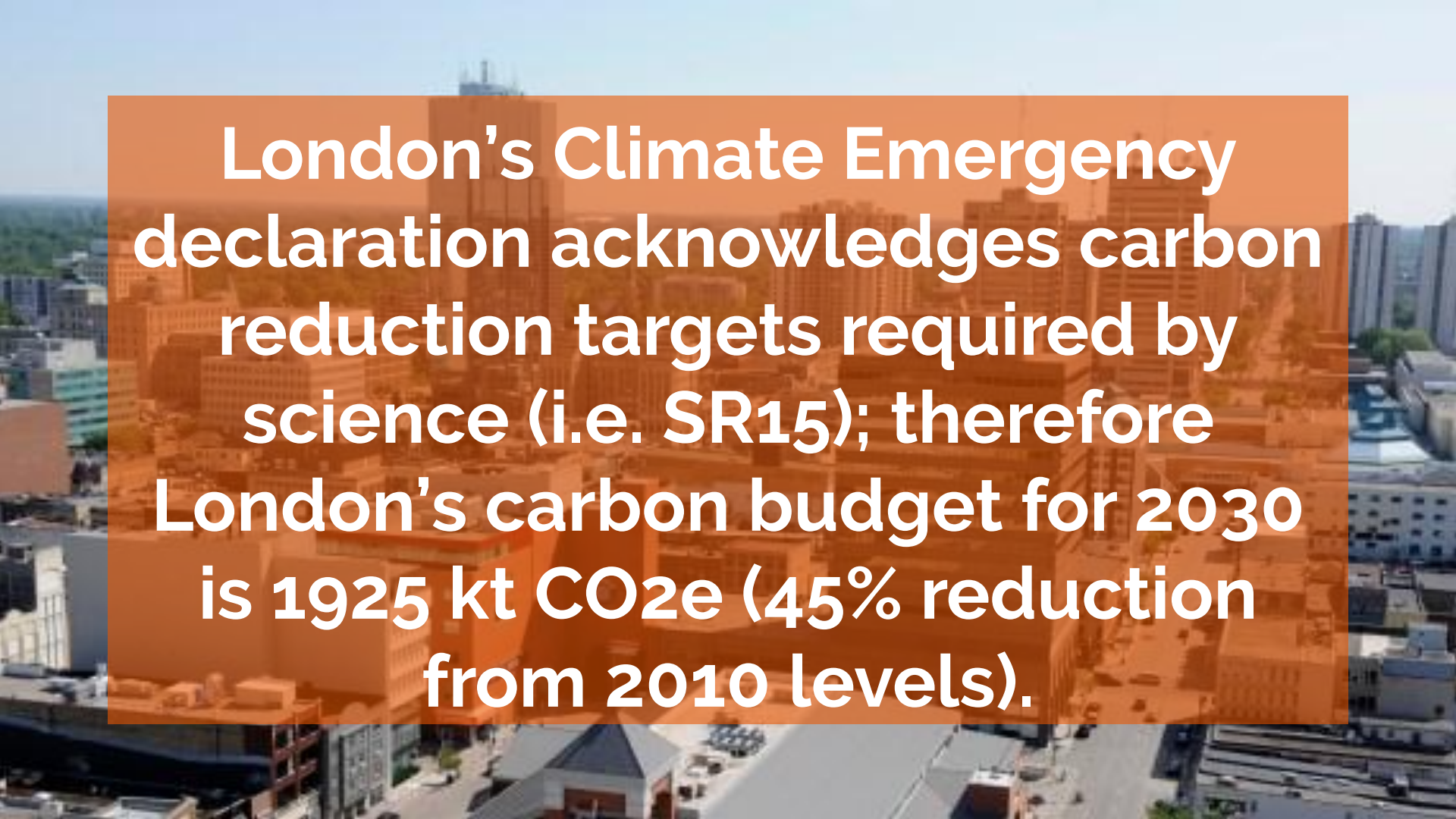
London's total carbon emissions in 2017 were 2870 kilotonnes (kt) CO₂ equivalent (CO₂e)

Largest source of emissions is transportation sector

Around 70% of transportation sector emissions is from personal vehicles

City of London GHG Emissions by Sector



An aerial photograph of a city skyline, likely London, featuring various buildings and green spaces. A large, semi-transparent orange rectangle is overlaid on the center of the image, containing white text. The text is centered and reads: "London's Climate Emergency declaration acknowledges carbon reduction targets required by science (i.e. SR15); therefore London's carbon budget for 2030 is 1925 kt CO2e (45% reduction from 2010 levels)." The text is in a bold, sans-serif font.

London's Climate Emergency declaration acknowledges carbon reduction targets required by science (i.e. SR15); therefore London's carbon budget for 2030 is 1925 kt CO₂e (45% reduction from 2010 levels).

Scenario Analysis of Carbon Emissions

Methodology

Different scenarios are analyzed, considering:

- Variable electrification of the automotive sector
- Complete electrification of the transit sector
- Variable mode split scenarios
- No changes in residential, industrial, and sewage emissions are assumed due to longer lifecycles of equipment, which is unlikely to be significantly changed by 2030 (also outside our scope as a committee)

Scenario Analysis of Carbon Emissions

TMP-Based Mode Split

TMP considers scenarios with two different growth patterns:

- **Scenario A:** population growth of 73,800 to a total population of ~430,000 by 2030 (21% increase from 2007)
- **Scenario B:** population growth of 140,000 to a total population of ~493,000 by 2030 (39% increase from 2007)
- No change in vehicle electrification assumed

Transportation Master Plan (TMP)

Mode Split Targets

| Mode | 2009 Mode Split | 2030 Target |
|-----------------------|-----------------|-------------|
| Automobile | 76% | 60% |
| Transit | 11% | 20% |
| Active Transportation | 9% | 15% |
| - Cycling | ~1% | 5% |
| - Walking | ~8% | 10% |
| Other | 5% | 5% |

TMP-Based Mode Split Analysis

| | Scenario A (pop 430,000) | Scenario B (pop 493,000) |
|---|-----------------------------|-----------------------------|
| Change in transportation emissions (kt CO ₂ e) | -61 | +133 |
| % Change in transportation emissions relative to 2010 | -4% | +10% |
| Total 2030 Carbon Budget kt CO ₂ e | 1925 | 1925 |
| Residential kt CO ₂ e | 510 | 510 |
| Industrial kt CO ₂ e | 830 | 830 |
| Sewage kt CO ₂ e | 140 | 140 |
| Transportation as % of allowable GHG in 2030 | 68% | 78% |
| Total Emissions (% of 2030 Target) | 145% | 155% |

Scenario Analysis of Carbon Emissions

TMP-Based Mode Split with Electrification

The effects of electrification are examined:

- Full electrification of transit fleet assumed
- Variable electrification of vehicles considered
- International Energy Agency estimates ~30% electrification of personal vehicles by 2030
- Lifecycle emissions of EVs are on average 50% of conventional vehicles (potentially as low as 30% for carbon-free energy supply)

TMP-Based Analysis with Electrification

| | 100% EVs (pop 430,000) | 50% EVs (pop 430,000) | 25% EVs (pop 430,000) |
|--|---------------------------|--------------------------|--------------------------|
| Change in transport emissions (kt CO2e) | -716 | -388 | -225 |
| % Change in transport emissions relative to 2010 | -52% | -28% | -16% |
| Total 2030 Carbon Budget kt CO2e | 1925 | 1925 | 1925 |
| Residential kt CO2e | 510 | 510 | 510 |
| Industrial kt CO2e | 830 | 830 | 830 |
| Sewage kt CO2e | 140 | 140 | 140 |
| Transportation as % of allowable GHG in 2030 | 34% | 51% | 59% |
| Total Emissions (% of 2030 Target) | 111% | 128% | 136% |

Scenario Analysis of Carbon Emissions

Variable Mode Split without Electrification

The effects of mode split are examined:

- Reduce vehicle mode split
- Assume 5% "other" mode split
- Assume remaining share is equally split between active transportation and transit
- Assume Scenario A for population growth
- No change in vehicle electrification assumed

Variable Mode Split Analysis without Electrification

| Parameter | Mode Split 5 | Mode Split 15 | Mode Split 30 | Mode Split 45 | Mode Split 60 |
|---|--------------|---------------|---------------|---------------|---------------|
| Automobile Mode Share (%) | 5 | 15 | 30 | 45 | 60 |
| Transit Mode Share (%) | 45 | 40 | 30 | 25 | 20 |
| Active Transport Mode Share (%) | 45 | 40 | 30 | 25 | 15 |
| Other Transport Mode Share (%) | 5 | 5 | 10 | 5 | 5 |
| Transportation GHG (kt CO2e) | 109 | 327 | 654 | 982 | 1309 |
| GHG Non-Transport (kt CO2e) | 1480 | 1480 | 1480 | 1480 | 1480 |
| GHG-All (kt CO2e) | 1589 | 1807 | 2134 | 2462 | 2462 |
| Change in GHG from 2009 | -92% | -76% | -52% | -28% | -4% |
| 2030 Emissions Budget (kt CO2e) | 1925 | 1925 | 1925 | 1925 | 1925 |
| Transport Fraction of 2030 C Target | 6% | 17% | 34% | 51% | 68% |
| Total GHG Relative to Target (kt CO2e) | -336 | -118 | 209 | 537 | 864 |
| Total Emissions (% of 2030 Target) | 83% | 94% | 111% | 128% | 145% |

Scenario Analysis of Carbon Emissions

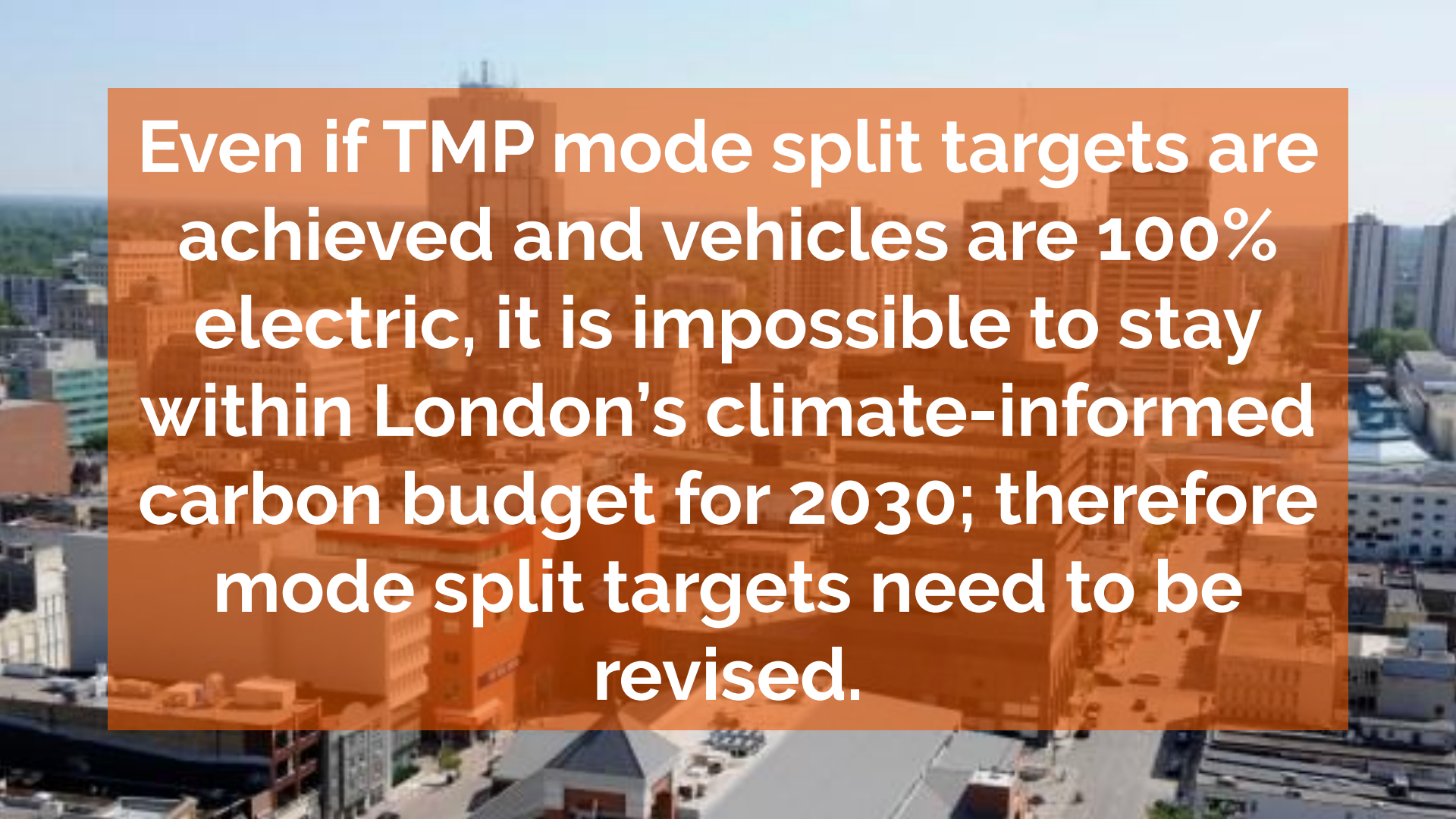
Variable Mode Split with Electrification

The effects of mode split are examined:


- This analysis represents “best of both worlds”; significant mode split changes with variable electrification
- Considers Scenario A for population growth

Variable Mode Split Analysis with Electrification

| Parameter | TMP (Mode Split 60) | Mode Split 30 0% EV | Mode Split 30 25% EV | Mode Split 30 100% EV | Mode Split 45 25% EV |
|---|------------------------|------------------------|-------------------------|--------------------------|-------------------------|
| Automobile Mode Share (%) | 60 | 30 | 30 | 30 | 45 |
| Transit Mode Share (%) | 20 | 35 | 35 | 35 | 25 |
| Active Transport Mode Share (%) | 15 | 30 | 30 | 30 | 25 |
| Other Transport Mode Share (%) | 5 | 5 | 5 | 5 | 5 |
| Transportation GHG (kt CO2e) | 1309 | 654 | 573 | 327 | 859 |
| GHG Non-Transport (kt CO2e) | 1480 | 1480 | 1480 | 1480 | 1480 |
| GHG-All (kt CO2e) | 2462 | 2134 | 2053 | 1807 | 2339 |
| Change in GHG from 2009 | -4% | -52% | -58% | -76% | -37% |
| 2030 Emissions Budget (kt CO2e) | 1925 | 1925 | 1925 | 1925 | 1925 |
| Transport Fraction of 2030 C Target | 68% | 34% | 30% | 17% | 45% |
| Total GHG Relative to Target (kt CO2e) | 864 | 209 | 128 | -118 | 414 |
| Total Emissions (% of 2030 Target) | 145% | 111% | 107% | 94% | 121% |

An aerial photograph of a city, likely London, showing a dense urban landscape with various buildings and streets. A large, semi-transparent orange rectangle is overlaid on the center of the image, containing white text. The text is bold and reads: "Even if TMP mode split targets are achieved and vehicles are 100% electric, it is impossible to stay within London's climate-informed carbon budget for 2030; therefore mode split targets need to be revised." The background image shows a mix of modern and older architecture, with a clear sky above the city.

Even if TMP mode split targets are achieved and vehicles are 100% electric, it is impossible to stay within London's climate-informed carbon budget for 2030; therefore mode split targets need to be revised.

An aerial photograph of a city skyline, featuring various buildings and streets. A large, semi-transparent orange rectangle is overlaid on the center of the image, containing white text. The text discusses the insufficiency of current TMP mode split targets and the need for a Cycling Master Plan to increase the cycling mode split from 5% to approximately 25% or greater.

While it is absolutely clear that the existing TMP mode split targets are insufficient, we can rapidly address some of these needs through the Cycling Master Plan. To achieve GHG reduction goals, the current Cycling Master Plan requires an increase in planned cycling mode split from 5% to ~25% or greater.

Climate-Informed Mode Split Target


- 100% Electrification of London Transit Vehicles
- 25% Electrification of Private Cars and City Vehicles
- Mode Split:
 - 25% Automobile
 - 35% Transit
 - 35% Active Transportation (walking 10%, cycling 25%)
 - 5% Other
- Net GHG Emissions for this outcome: 1957 kt CO₂e, ~102% of permitted emissions

Financial Benefit of Acting Now

- With a rising price on emitting carbon in Canada, London will benefit economically from acting sooner rather than later on climate emergency
- Canada's price on carbon is not a tax, but a fee and dividend system, which charges excessive polluters and reward those who cut emissions faster and deeper
- As individuals and as a city we can collect dividend payments by lowering our overall carbon footprint
- If London acts earlier than other cities on decreasing emissions, it will represent a significant wealth injection into the city on the order of tens of millions of dollars per year

TMP-Based Analysis with Electrification

| | |
|---|--------------|
| Price of 1t CO ₂ e emitted in 2022: | \$50 |
| Price of 1t CO ₂ e emitted in 2030 (PBO estimate): | \$102 |
| Current emissions (tonnes CO ₂ e): | 2,870,000 |
| TMP emissions (tonnes CO ₂ e): | 2,789,000 |
| Mode Split 30 emissions + 25% EV (tonnes CO ₂ e): | 2,053,000 |
| Difference [MS30-ev25 - TMP] (tonnes CO ₂ e): | 736,000 |
| 2022 [MS30-ev25 - TMP] Difference x Carbon Dividend (annual): | \$36,800,000 |
| 2030 [MS30-ev25 - TMP] Difference x Carbon Dividend (annual): | \$75,072,000 |

An aerial photograph of a city skyline, featuring various buildings and streets. A semi-transparent orange rectangular box is overlaid on the center of the image, containing white text. The text is a single paragraph discussing the need for changes in cycling mode split targets to meet carbon reduction goals.

It is clear that major changes in cycling mode split targets are required to meet carbon reduction targets. We must then determine how we can achieve a much more aggressive shift in mode split.

Vision Zero

On May 16, 2017, Municipal Council adopted the following principles as its Vision Zero declaration:

- No loss of life is acceptable
- Traffic fatalities and serious injuries are preventable
- We all make mistakes
- We are all physically vulnerable when involved in motor vehicle collisions
- Eliminating fatalities and serious injuries is a shared responsibility between road users and those who design and maintain our roadways



Vision Zero vs. London Road Safety Strategy



Vision Zero

Traffic deaths are preventable, and the loss of life is not negotiable

London Road Safety Strategy

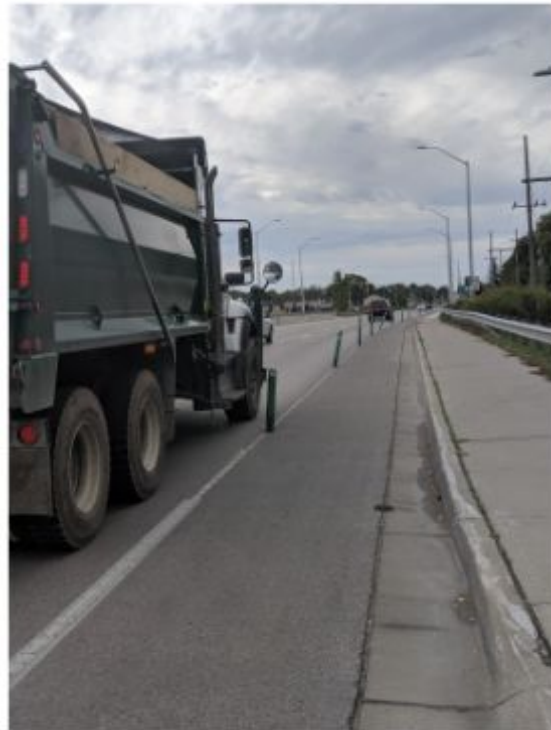
Reduce injury and death on roads by 10% within five years

Vision Zero holds transportation systems designers and policy-makers accountable and responsible for road safety, rather than individual road users

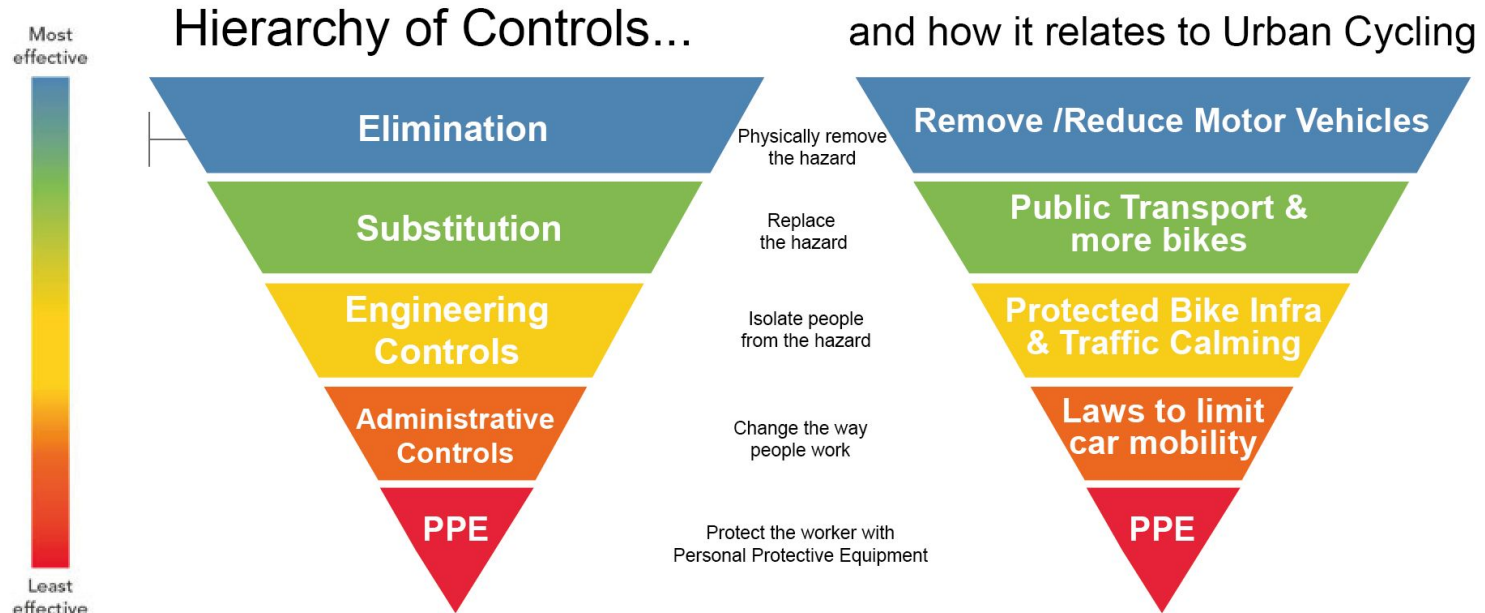
London's Interpretation of Vision Zero


- London's goal accepts:
 - More than 1000 injuries and deaths on our roads are inevitable
 - Programs (i.e. not safe systems) will reduce injury and death
- Vision Zero requires focus on **system failure**
- Safe system design focuses on building better roads, improving vehicle safety technologies, and managing kinetic energy (speed reduction) to reduce risk of injury
- Strives to create road system designs that anticipate human error, and that are forgiving when errors are made

Representative Non-Safe Systems



Hierarchy of Controls



An aerial photograph of a city skyline, featuring various buildings and streets. A large, semi-transparent orange rectangle is overlaid on the center of the image, containing white text. The text is centered and reads: "Of the major initiatives in the CMP, the majority of planned initiatives are considered to be Administrative or Behavioural Controls. Less than 1% of planned interventions (protected bike lanes, 7.5 km out of 799 km of “facilities”) could be considered Engineering controls, and 0% of the CMP could be considered Substitution or Elimination." The background shows a dense urban environment with a mix of low-rise and high-rise buildings under a clear sky.

Of the major initiatives in the CMP, the majority of planned initiatives are considered to be Administrative or Behavioural Controls. Less than 1% of planned interventions (protected bike lanes, 7.5 km out of 799 km of “facilities”) could be considered Engineering controls, and 0% of the CMP could be considered Substitution or Elimination.

Cycling Infrastructure Assessment

Achieving the required GHG reductions is possible, and other cities of similar size have already done this

- It is important to note the role of great transit and land use policy in achieving these goals
- Here, we focus on how cycling infrastructure plays a role in achieving GHG reduction goals



Mode Split in Winter Cities

| City | Population | Area (km²) | Bike Share (%) | Transit Share (%) |
|---------------------|----------------|--|----------------|-------------------|
| London, CAN | 355,000 | 232 sub/urban 402 incl. south rural | ~1% | 11% |
| Montreal, CAN | 1,780,000 | 431 | 3% | 19% |
| Toronto, CAN | 2,930,000 | 630 | 1% | 24% |
| Vancouver, CAN | 675,000 | 115 | 12% | 17% |
| Copenhagen, DEN | 602,000 | 88 | 62% | 27% |
| Utrecht, NL | 1,285,000 | 99 | 33% | 28% |
| Uppsala, SWE | 168,000 | 49 | 28% | 20% |
| Munster, GER | 310,000 | 302 | 39% | 11% |
| Freiburg, GER | 227,000 | 153 | 13% | 12% |
| Bremen, GER | 557,000 | 326 | 25% | 24% |

Achieving High Cycling Mode Split

- Attaining high modal splits for cycling and transit is possible in winter cities
- Attaining high modal split in relatively lower density cities is also possible (e.g. Bremen, Munster)
- High transit usage and high cycling mode split are not necessarily coincident (e.g. Munster); both require different infrastructure investments that are complementary when done well (e.g. Utrecht)

The Four Types of Bicyclists



Strong and Fearless

People willing to bicycle with limited or no bicycle-specific infrastructure

Enthusied and Confident

People willing to bicycle if some bicycle-specific infrastructure is in place

Interested but Concerned

People willing to bicycle if high-quality bicycle infrastructure is in place

No Way, No How

People unwilling to bicycle even if high-quality bicycle infrastructure is in place

Distribution of the Four Types of Bicyclists

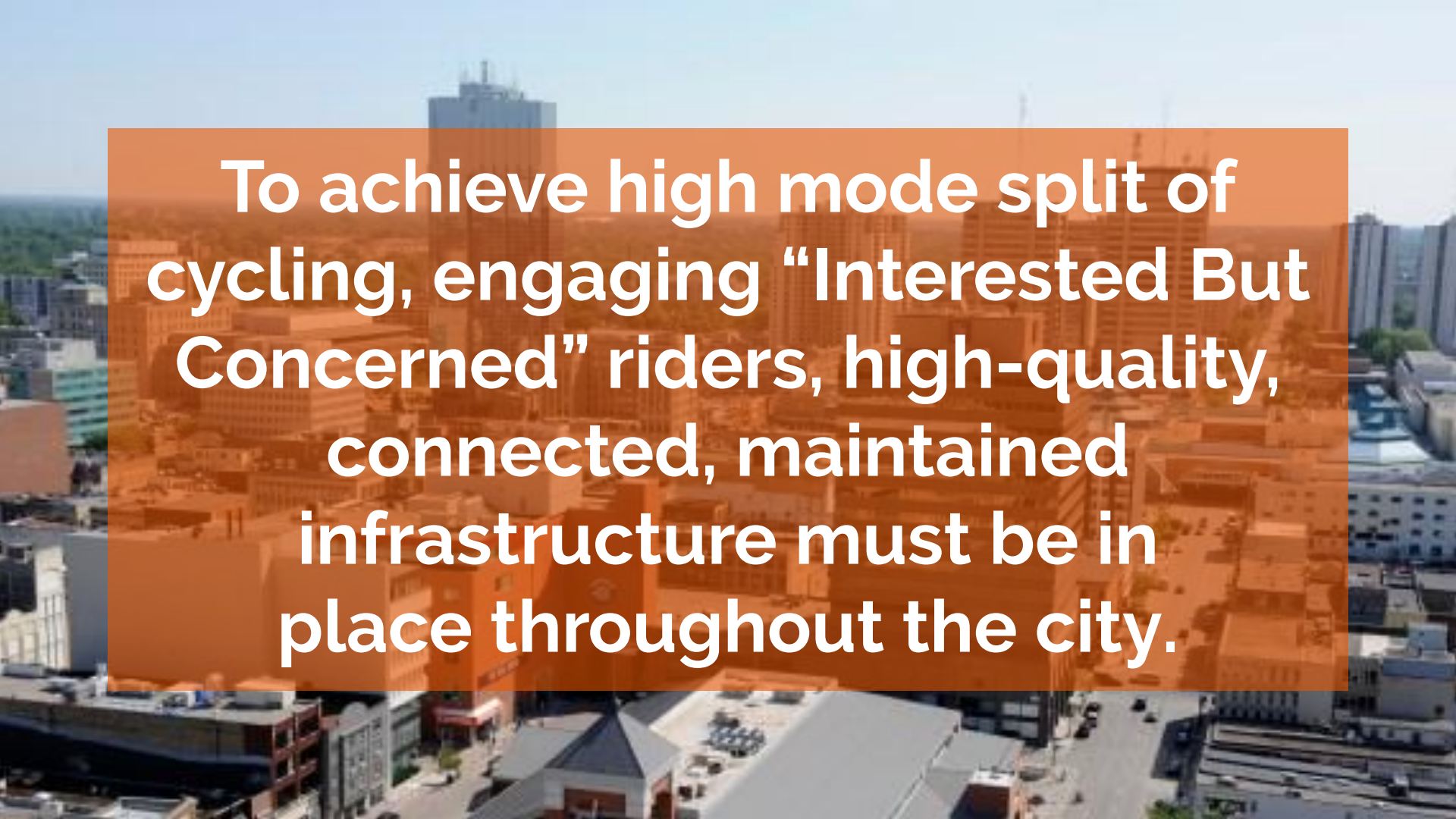


London, ON: A Major Outlier?

- “The market for commuter based cycling infrastructure is approximately 9% of the overall population” - City of London Transportation Master Plan
- London's CMP is based on the premise that only 9% of the general population has a willingness to cycle; this is suspiciously similar to the “Strong and Fearless” and “Enthused and Confident” groups
- It is with virtually certainty that we conclude that London's potential cycling market share is not a measly 9%, but given proper infrastructure, greater than 60% of the total population would choose cycling for many trips

Infrastructure Requirements for AAA




An aerial photograph of a city skyline, featuring various buildings and streets. A large, semi-transparent orange rectangle is overlaid on the center of the image, containing white text. The text is bold and reads: "To achieve high mode split of cycling, engaging 'Interested But Concerned' riders, high-quality, connected, maintained infrastructure must be in place throughout the city." The background shows a dense urban environment with a mix of low-rise and mid-rise buildings, and some greenery visible in the distance.

To achieve high mode split of cycling, engaging “Interested But Concerned” riders, high-quality, connected, maintained infrastructure must be in place throughout the city.

AAA Infrastructure in the CMP

| | Existing in 2016 (km) | Proposed in CMP (km) | Total (km) |
|-----------------------------------|-----------------------|----------------------|--------------|
| Cycle Track (Protected Bike Lane) | 0 | 7.5 | 7.5 |
| In-Boulevard Multi-use Pathway | 42 | 28.2 | 70.2 |
| Multi-use Pathway | 166 | 78.7 | 244.7 |
| Total | 208 | 114.4 | 322.4 |


- Of the 799 km of facilities proposed in the CMP, only 7.5 km (less than 1%) are cycle tracks
- This represents <1% of arterial road network
- The value of multi-use pathways is acknowledged for recreational cycling; however these are less effective for shifting mode share since they do not directly access many key destinations

An aerial photograph of a city skyline, likely London, featuring various buildings and a prominent tall skyscraper in the background. A large, semi-transparent orange rectangle is overlaid on the center of the image, containing white text. The text discusses London's planned bike routes and their quality standards.


Only 4% of London's planned bike routes over the next four years meet AAA quality standards. Stated differently, London's approach builds 96% of its cycling infrastructure to serve existing cyclists (Strong and Fearless, Enthused and Confident) marginally better, rather than planning streets for a wider ridership demographic, which represents more than 90% of the population.

Who Are We Building Bike Lanes For?

- Building for the “Fearless” and “Enthusied and Confident” groups may allow London to meet the TMP-based 5% mode share goal
- However, it will never be able to grow beyond 5-10% mode share without accessing the “Interested but Concerned” group of riders
- Most people don't consider cycling as an option for because they have never seen, let alone used, quality AAA bike infrastructure
- Once people see and try AAA infrastructure, they will choose a bike for many trips; until that point, citizens will never ask for it, because they don't know that it is even possible

An aerial photograph of a city skyline, featuring various buildings and a street with cars. A large, semi-transparent orange rectangle is overlaid on the center of the image, containing white text.

Building a City-Wide Network of All Ages and Abilities bike facilities is a necessary part of achieving our GHG reduction targets. We cannot achieve our GHG targets without this investment, and stand to greatly benefit as a city by building the network as soon as possible.

An aerial photograph of a city skyline, featuring various buildings and a street with cars. A large, semi-transparent orange rectangle is overlaid on the center of the image, containing white text. The text is a single paragraph discussing the cost-effectiveness of increasing cycling mode split compared to transit for achieving GHG reduction targets.

Focusing on increasing cycling mode split is a cost effective and quick way of achieving GHG reduction targets as compared to transit, which requires much larger infrastructure investments and longer timelines for completion.

Comparison with Other Cities

London's Cycling Master Plan was compared with the plans from similar cities around Canada: Halifax (2014), Waterloo Region (2014), Ottawa (2013), Waterloo (2011), Victoria Capital Regional District (2011), and K (2010)



City of Calgary

How Does London Differ?

- Addressing “Interested but Concerned” Cyclists
 - Each of the other cities recognizes this as an important group to target
- Identifying Goals and Expected Outcomes
 - Every other city identifies significantly increasing the cycling mode share and reducing cycling collisions as a metric for evaluating the cycling policies and actions
- Criteria for Evaluating the Success of Projects
 - The best plans consider methods for evaluating the success and gauging the potential for projects to increase mode share
- Data and Demographics Collection
 - Other cities address the need for and the means for collecting the data that their planning and evaluative processes require in order to facilitate data-driven decision-making

Conclusions

London's CMP states its vision of “providing infrastructure which is considered comfortable, safe, and convenient...for all Londoners.”

→ Climate Emergency

The target mode share of the CMP does not allow for sufficient reductions in GHG emissions

→ Vision Zero

The current CMP is inconsistent with the Vision Zero safe systems design principles

→ Metrics of Success

Kilometres of lanes is the metric of success in the current CMP; the degree to which it provides infrastructure that is “comfortable, safe, and convenient” is not evaluated

Recommendations

We RECOMMEND that council:

- request a detailed evaluation of the greenhouse gas emissions implications of the City of London Transportation Master Plan in accordance with the City of London's Declaration of Climate Emergency.
- request a detailed evaluation of the greenhouse gas emissions implications of the City of London Transit Master Plan in accordance with the City of London's Declaration of Climate Emergency.
- request a detailed evaluation of the greenhouse gas emissions implications of the City of London Official Plan or The London Plan in accordance with the City of London's Declaration of Climate Emergency.
- request a detailed evaluation of the greenhouse gas emissions implications of the City of London Parking Strategy in accordance with the City of London's Declaration of Climate Emergency.

Recommendations

We RECOMMEND that council:

- request a detailed evaluation of the greenhouse gas emissions implications of the City of London Accessibility Strategy in accordance with the City of London's Declaration of Climate Emergency.
- request a detailed evaluation of the City of London Road Safety Strategy in accordance with the City of London's Adoption of Vision Zero
- direct staff to undertake major revisions to the City of London's Cycling Master Plan infrastructure implementation in accordance with the Declaration of Climate Emergency. The revised plan should be singularly focused on building All-Ages-and-Abilities infrastructure to achieve climate-informed modal split targets, while achieving cost allocation and social equity for basic affordable transportation by 2030.

Recommendations

We RECOMMEND that council:

- direct staff to design and construct an emergency city-wide minimum grid of protected bike lanes designed for All-Ages-and-Abilities to be completed by July 1, 2021.
- enact a moratorium on all currently planned and future road widening, except for the construction of transit or protected cycling facilities. Presently budgeted funds for road widening (\$75M/year) should be reallocated to transit and cycling for maximum mitigation of climate disruption.
- fund continued investment in active transportation (including walking, accessibility, and micro mobility) at a rate of \$50/person/year, or ~\$20M/year, comparable to the scale of investments in major cycling cities.
- decrease speed limits on all residential streets to 30 km/h.



Thank you for your attention!

**We now invite personal
statements from the Working
Group members**