Burlington Integrated Transit Mobility Plan
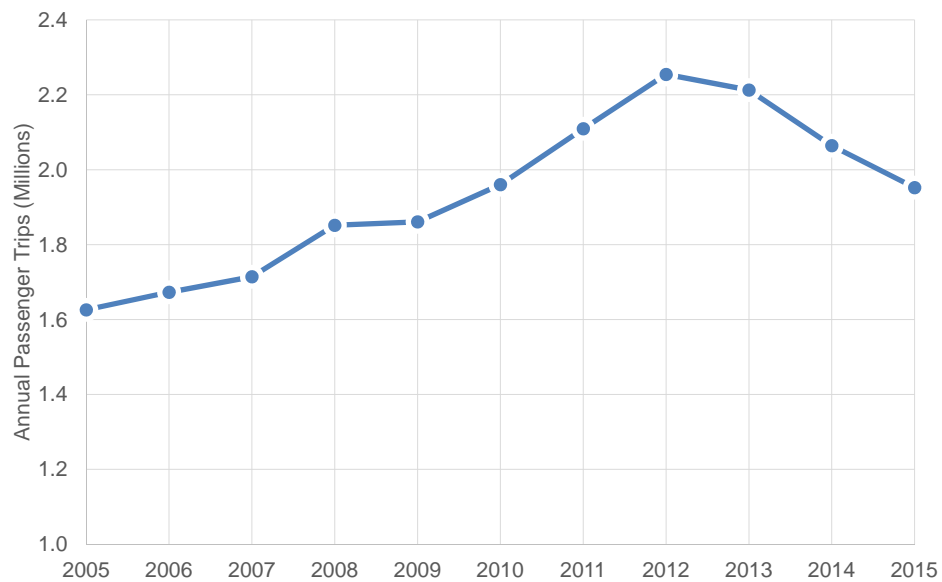
City Council Workshop
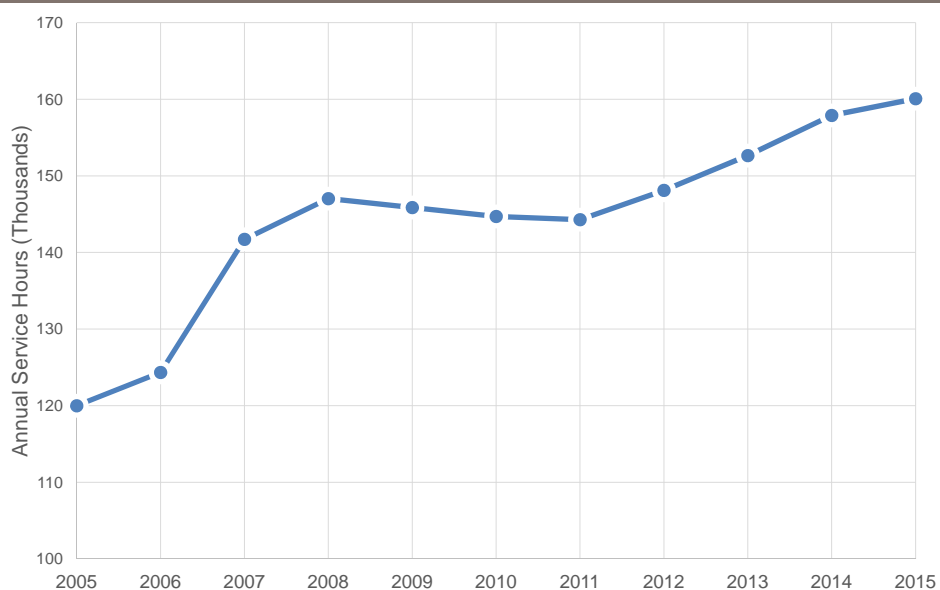
September 7, 2017

Agenda

1. Existing conditions and opportunities of transit
2. The ridership-coverage tradeoff
3. Alternative concepts for transit in Burlington
4. Q & A

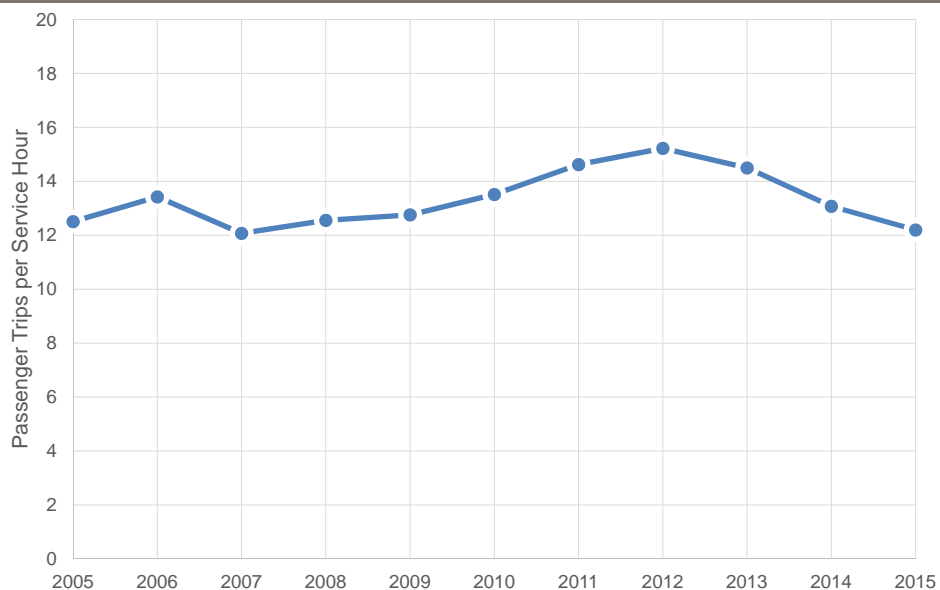# Existing Conditions in Burlington

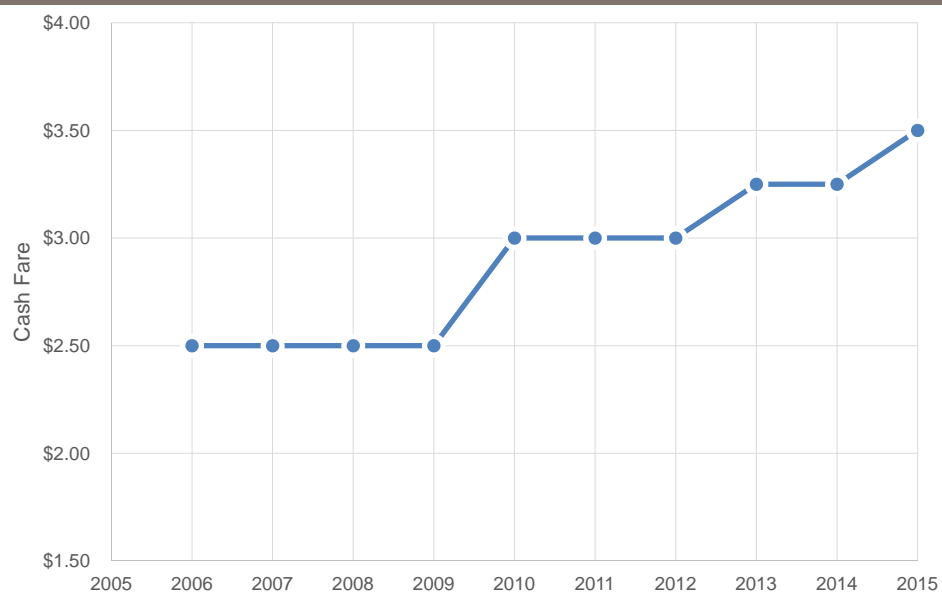# Ridership over recent years

Service levels over recent years

Productivity over recent years

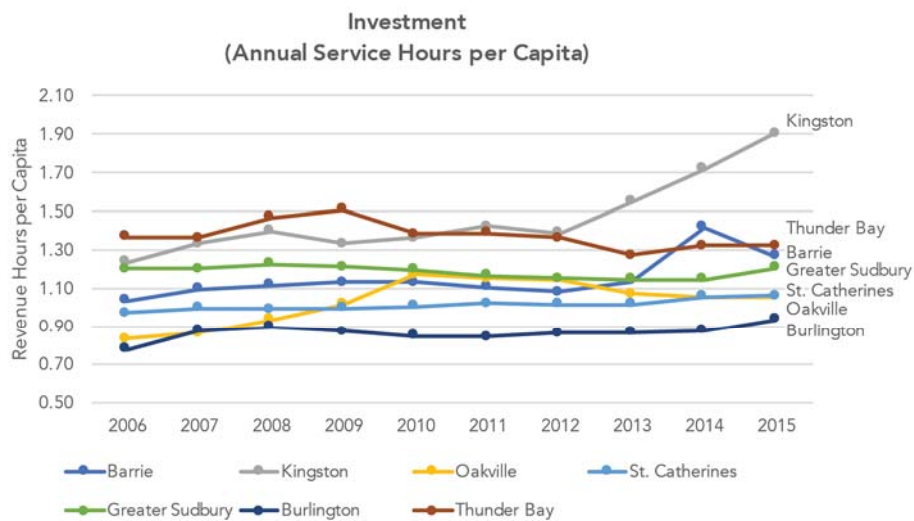## Fares over recent years

Peer Comparison

Burlington invests less than its peers . . .

Investment
(Annual Service Hours per Capita)

and gets less ridership

Relevance
(Passenger Trips per Capita)
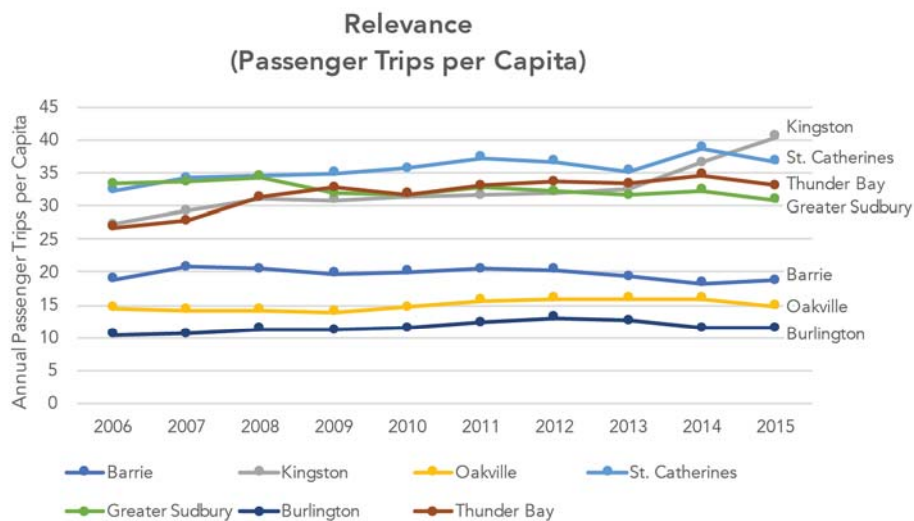
BT has been increasing fares faster than most peers
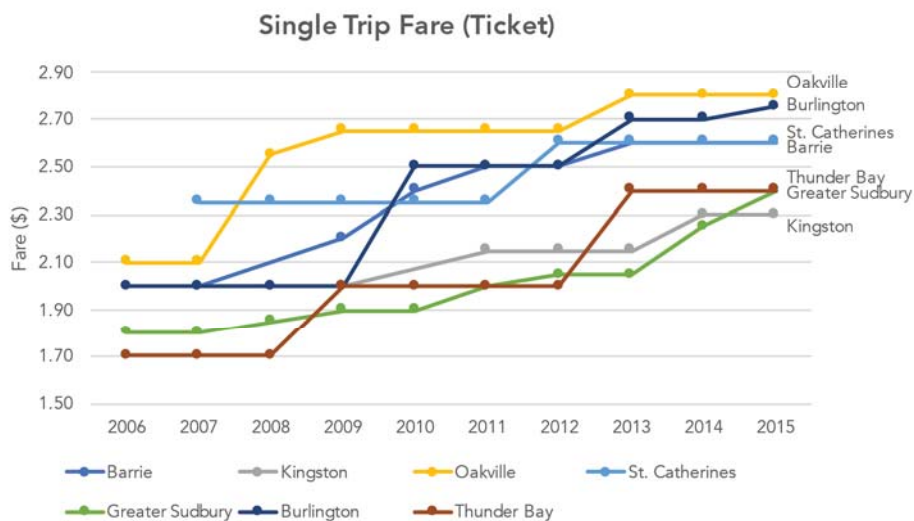
And has relatively low operating costs.
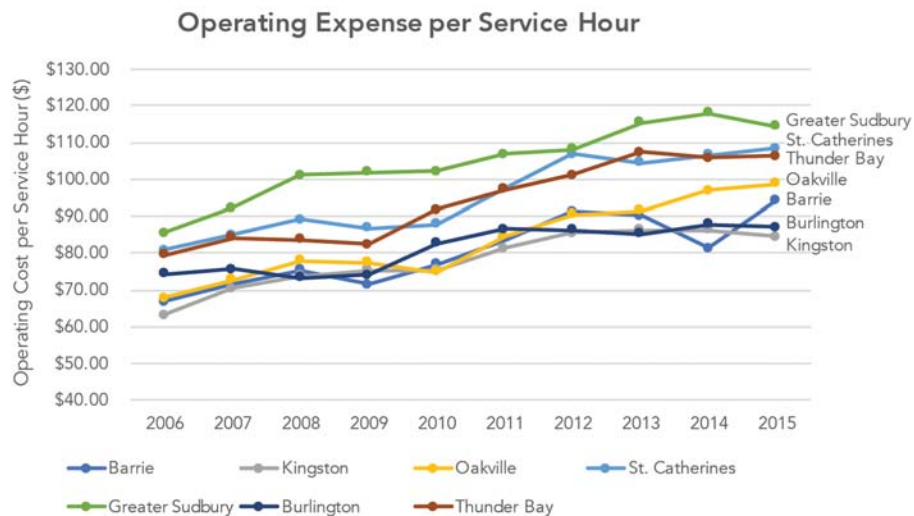
But also has lower productivity.

Productivity
(Passenger Trips per Service Hour)
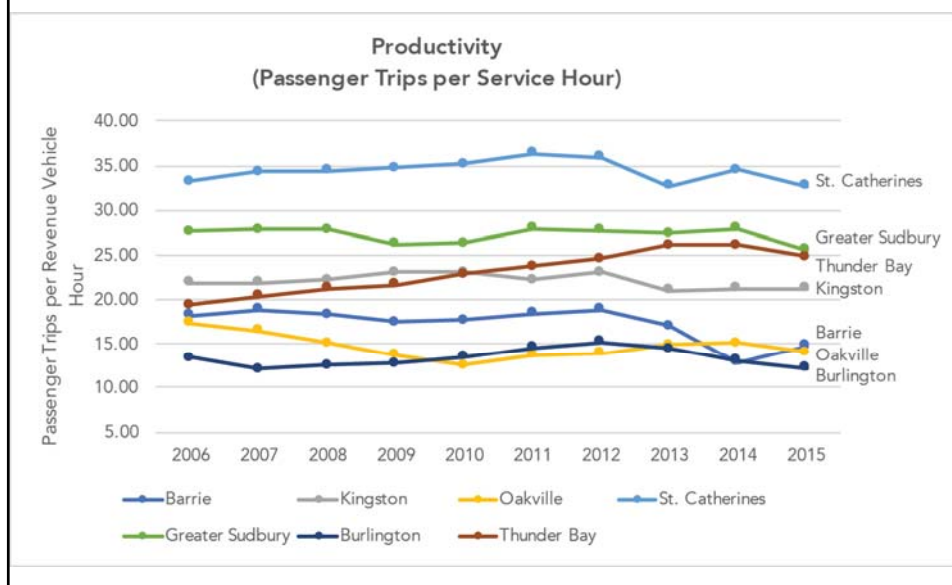
Low costs result in part from unsustainable practices

Weekday Service Hours by Layover Percentage
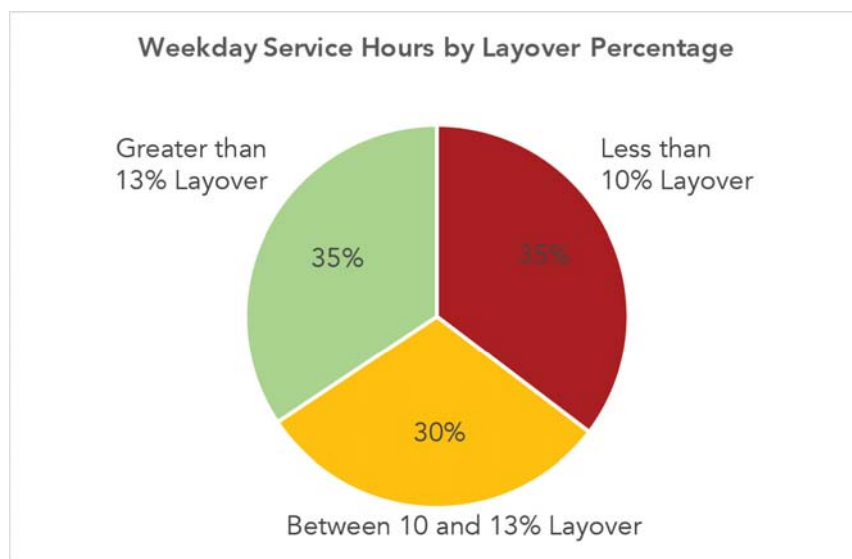
High-Ridership Transit Principles

To Expand Ridership, Expand Freedom

How far can Jane travel in 15 30 45 or 60 minutes?

The Wall
Around
Your Life

Existing Network 2016
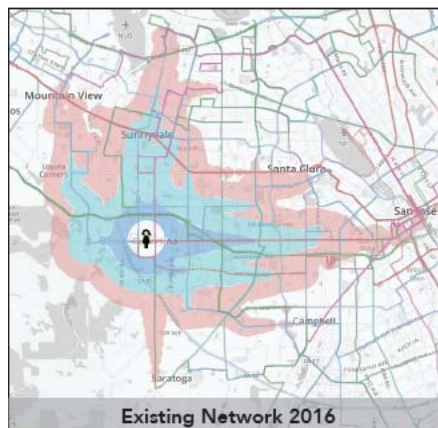
How do we do that?

- High <u>Frequency</u> Lines

- Forming a <u>Connected Network</u>

- Reasonably <u>fast and reliable</u>

- Focused on <u>Transit Friendly Places</u>
  - Dense
  - Walkable
  - Linear
  - Proximate

Existing Network 2016
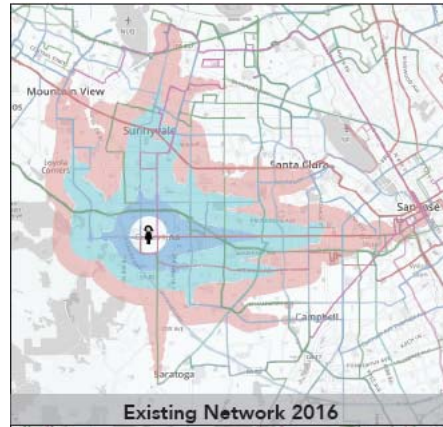
The ridership

"Frequency is Freedom!"

Frequency

Frequency Does 3 Great Things

- Go when you want to go. (Less waiting.)

- Connect from one line to another <u>easily</u>, so you can get to many places. *Frequency is what makes a network!*

- Less risk of disruption.
  - If the bus breaks down, another comes soon.
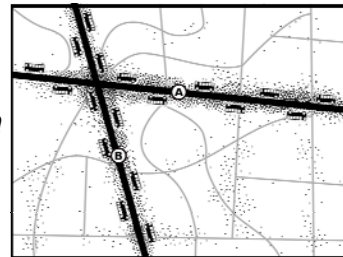
High frequency → More riders at less cost

The network

Productivity by Frequency
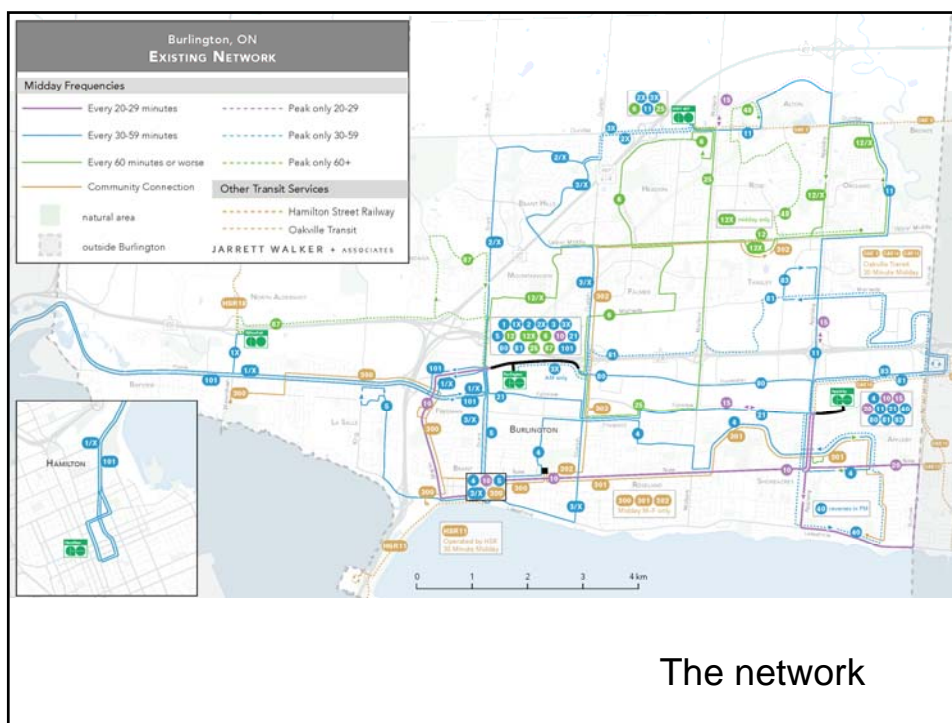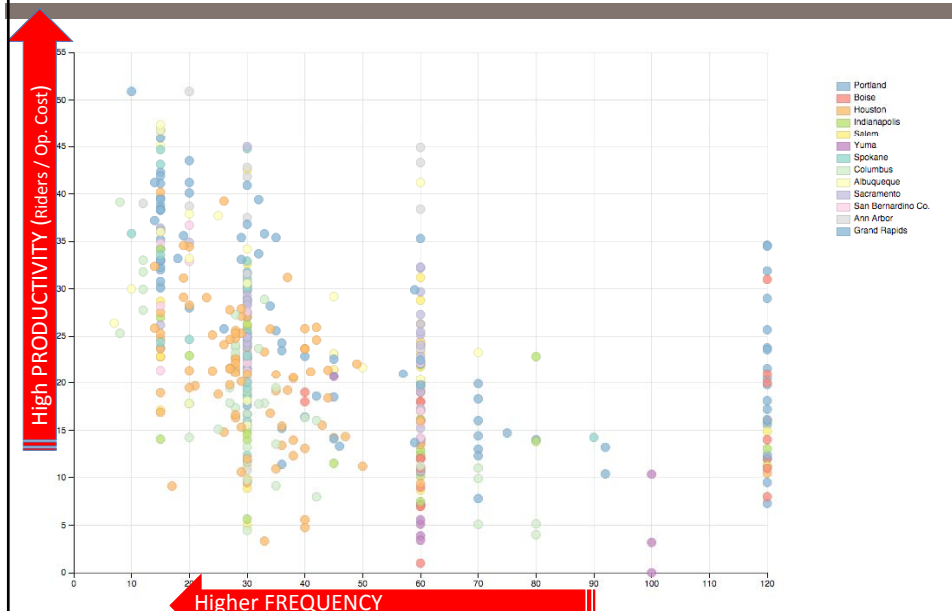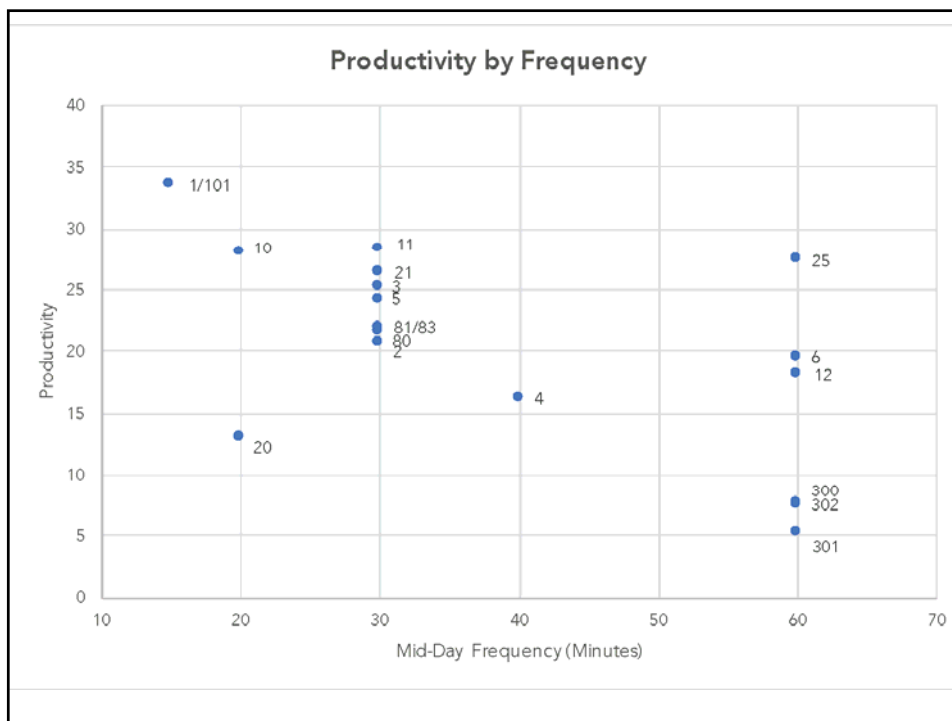
Where does high ridership transit go?

Land Use Drivers of Ridership

- Density
- Walkability
- Linearity

Density How many people are near transit?

The more people are going to and from the area around each stop, the more people will ride transit.

High
Ridership

Lower
Ridership

Density Drives Demand

Transit Demand (vertical axis)

Density (+walkability, linearity) (horizontal axis)

Wilderness, Rural, Brant Hills, Orchard, Plains Rd., Downtown Burlington, Inner City TO, Downtown TO

Burlington, ON
Activity Density

Residents / square km

Employees / square km

Data Source: Statcan 2016 Census counts, 2013 Halton Region Employment Survey.

Activity Density (combined population and employment density) indicates the total level of daily activity in an area, as most trips begin or end at a residence, workplace, or commercial establishment.

Density of housing and jobs

Walkability

Can the people around the stop walk to the stop?

High
Ridership

Lower
Ridership

Walkability

Limited street crossings,
long walks at
intersections.

Walkability

Linearity — Can transit run in straight lines that are useful to through-riders?

The straighter the line, the shorter the journey, and the more people can find it useful.

High Ridership

Lower Ridership
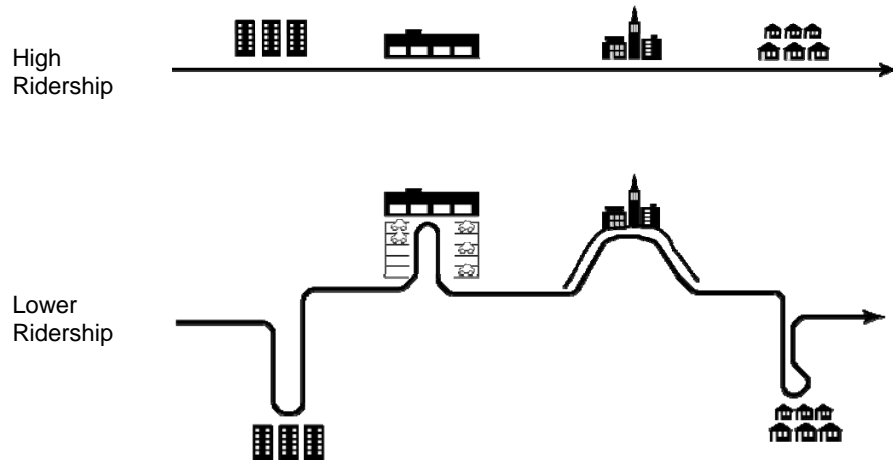
Linearity — Can transit run in straight lines that are useful to through-riders?

North of QEW, between the straight lines of the 2 km grid, the only possible routes are circuitous.
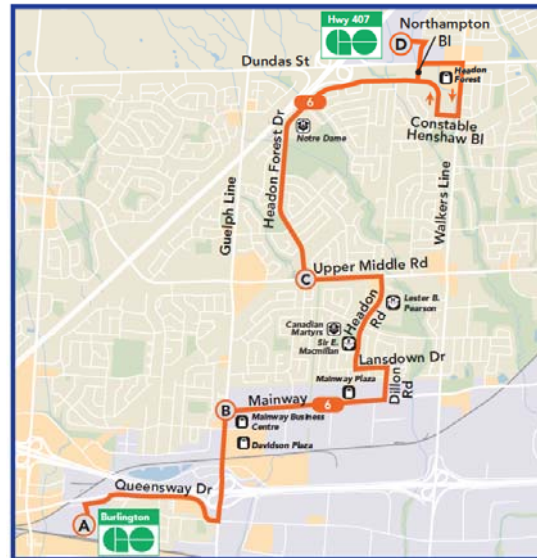
The Transit-Land Use Relationship is Two Way

- Dense, walkable, linear development
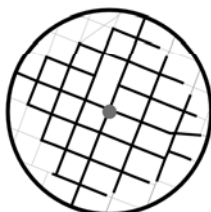 - Supports frequent and reliable transit
  - Needs frequent and reliable transit.

- Chicken and egg!
  So where do we start?
  - Start anywhere and everywhere.
  - But transit can lead.

- So transit is a long play.
  - Don't plan for year 1 ridership!

Transit

Development

17

The ridership
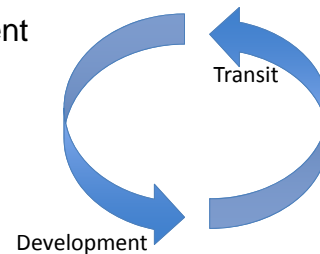
Diversity vs. specialization

Transit thrives on
diversity, not
specialization

Excess Specialization: Plains Rd

- Rapid and Local service on Plains Road.
- Specialized mid-day Community Connector Routes.
- Peak-only GO Station Service

But is Ridership What You Want?

How should a transit agency allocate its resources?
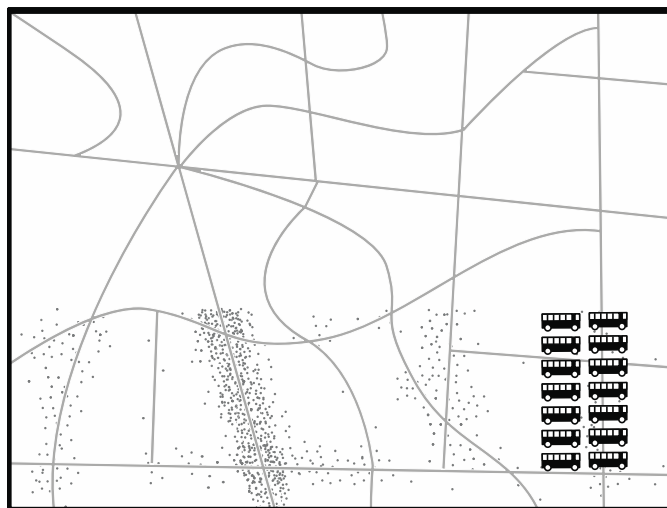
Ridership Goal "Maximum Ridership"

Think like a business, *choosing which markets you will enter*.

The straight lines offer density, walkability, and an efficient transit path, so you focus service there.

Because all 18 buses are focused on few lines, they are frequent.

Performance Measure: *Productivity*

Ridership relative to cost

Coverage Goal "Some service for everyone"

Think like a government service. Try to serve everyone, *even those in expensive-to-serve places*.

The result is more routes covering everyone, but less frequency and therefore lower ridership.
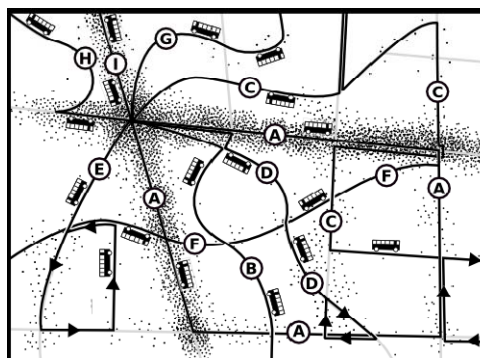
Performance Measure: *Coverage*

% of population and jobs near some service

Both goals are important,
… but they lead opposite directions!

Ridership Goal

- *"Think like a business."*
- Lower subsidy, higher farebox return.
- Support dense and walkable development.
- Maximum VKT reduction.
- Protect economy from congestion.
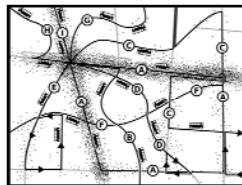
Coverage Goal

- *"Access for all"*
- Support suburban low-density development.
- Lifeline access for everyone, no matter where they live.
- Service to every neighbourhood or ward.

Burlington Transit can't solve this conflict between goals…

Ridership Goal
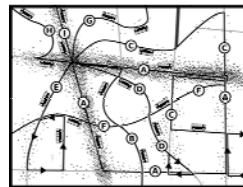
Coverage Goal

…but it CAN choose a deliberate balance point.

Alternatives for Burlington

How to balance coverage and ridership?

- Today, we estimate that Burlington Transit's budget is spent:
  - About 50% in pursuit of high ridership
  - About 50% in ways and places where ridership is predictably low

- Should that balance change?

- But designing for higher ridership means:
  - Higher frequencies
  - More direct routes
  - *Some coverage cuts.*

Ridership	Midpoint	Coverage
90% Ridership	70%	50% Ridership
10% Coverage	30%	50% Coverage
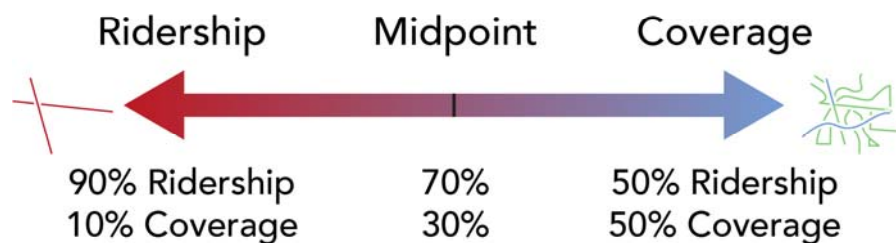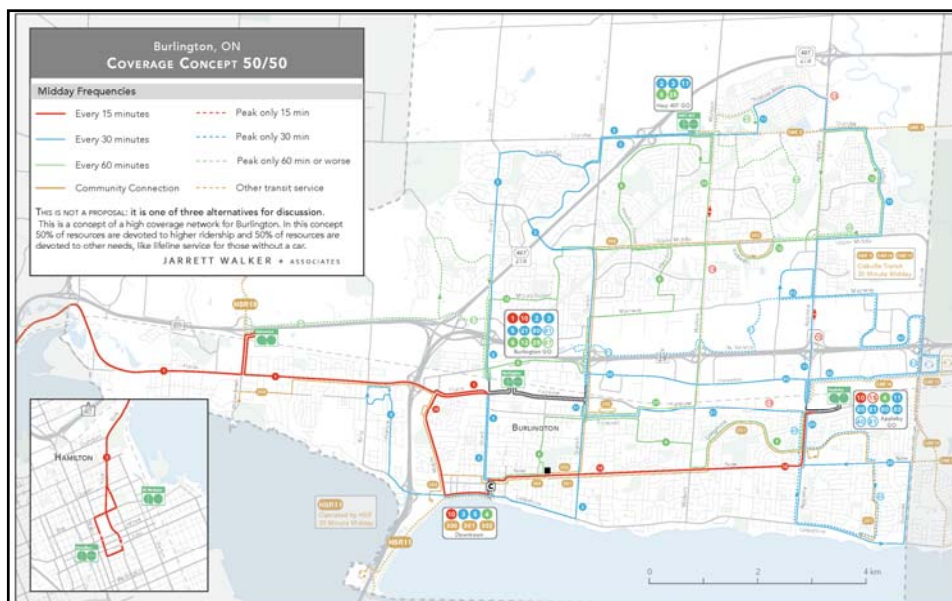
Coverage Concept
50% Ridership / 50% Coverage

Midpoint Concept
70% Ridership / 30% Coverage

Ridership (or Frequency) Concept
90% Ridership / 10% Coverage
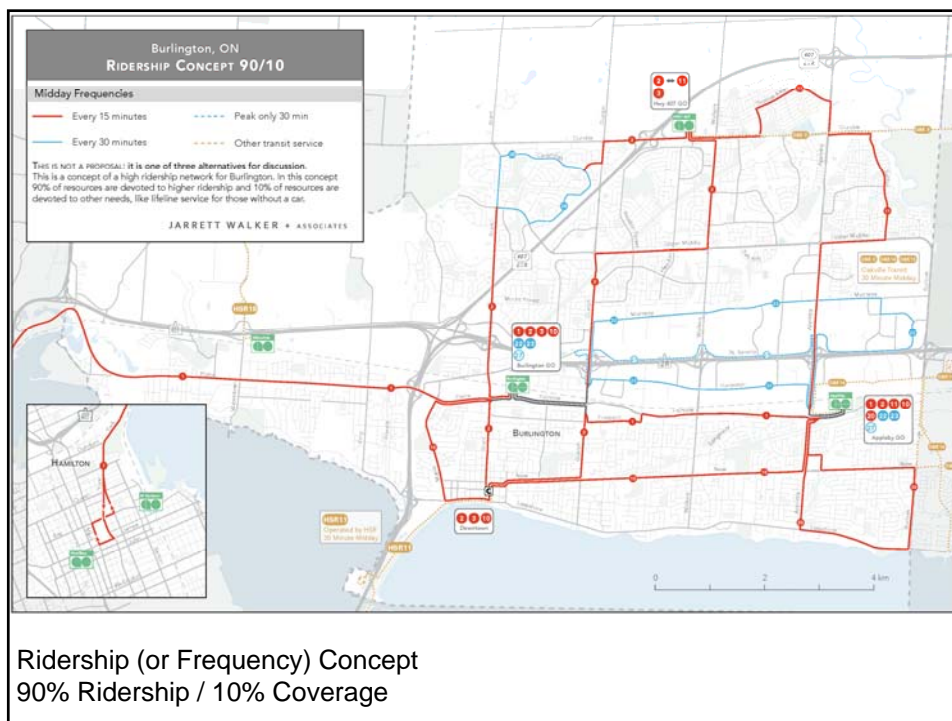
How would they perform?

How would they perform?

Coverage Concept

Existing Network

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

45 Minute Access
Burlington GO

45 Minute Access
Burlington GO
Coverage Concept

45 Minute Access
Burlington GO
Ridership Concept
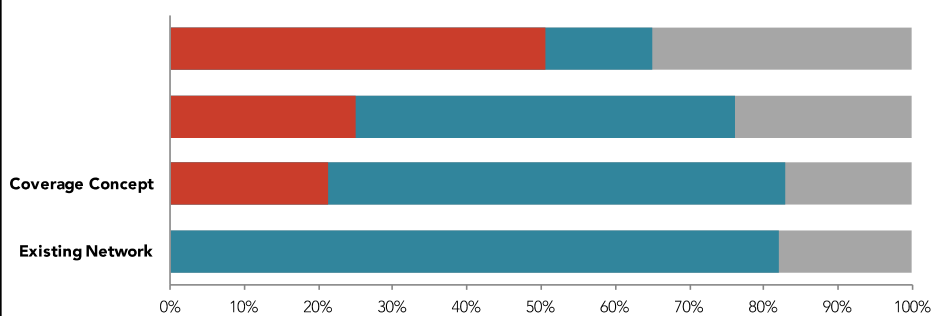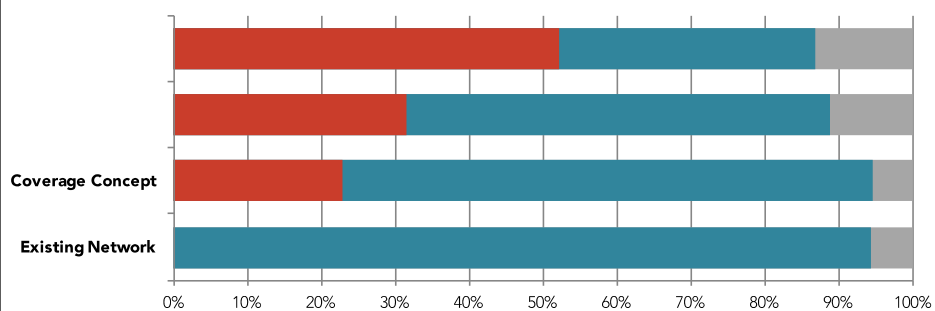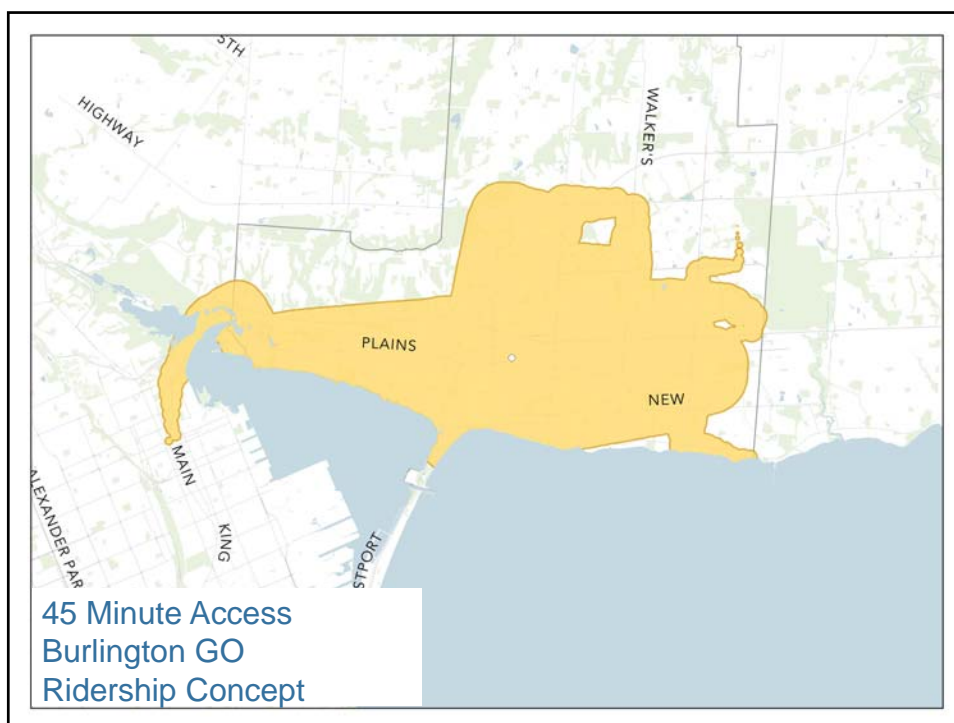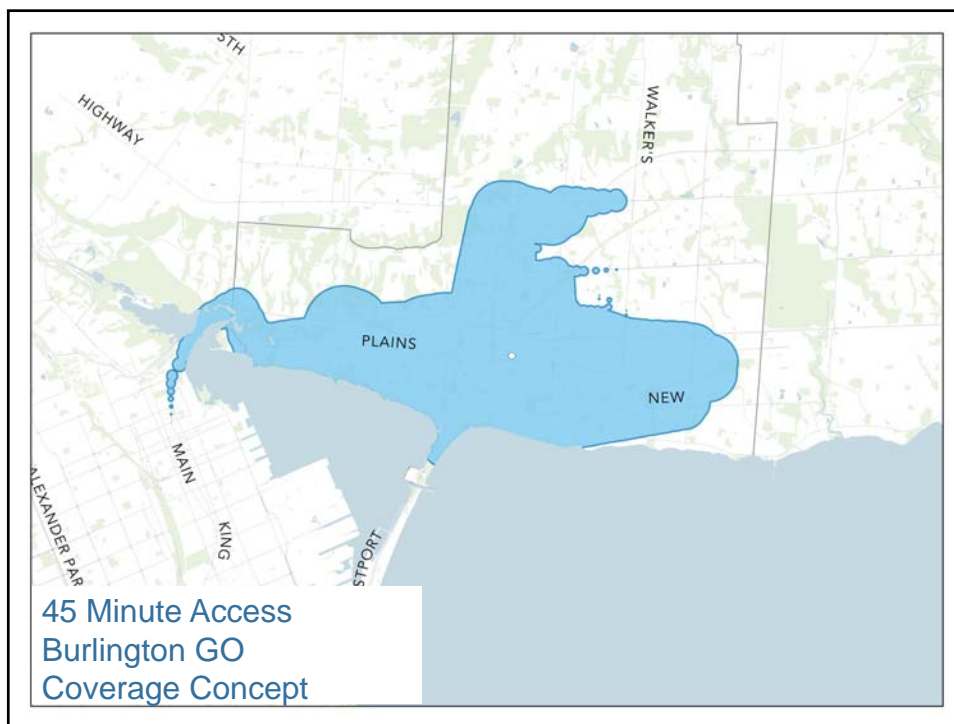
Burlington GO Change in Access

Time	Concept	Population	% Change	Jobs	% Change
15	Coverage	5,100	-	3,200	-
15	Midpoint	5,000	-3%	3,100	-1%
15	Ridership	6,100	19%	4,000	25%
30	Coverage	52,900	-	29,400	-
30	Midpoint	57,500	9%	31,500	7%
30	Ridership	63,300	20%	33,300	13%
45	Coverage	105,200	-	49,000	-
45	Midpoint	112,700	7%	50,900	4%
45	Ridership	138,500	32%	62,500	28%
60	Coverage	155,600	-	66,300	-
60	Midpoint	171,200	10%	68,200	3%
60	Ridership	176,800	14%	70,500	6%

45 Minute Access
Downtown Bus Terminal

45 Minute Access
Downtown Bus Terminal
Coverage Concept

45 Minute Access
Downtown Bus Terminal
Ridership Concept
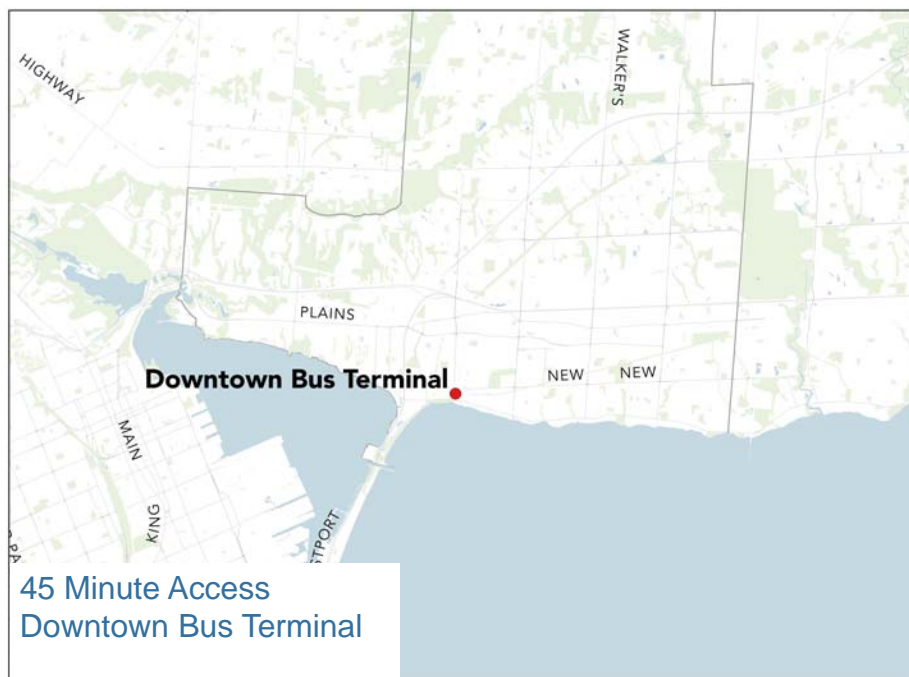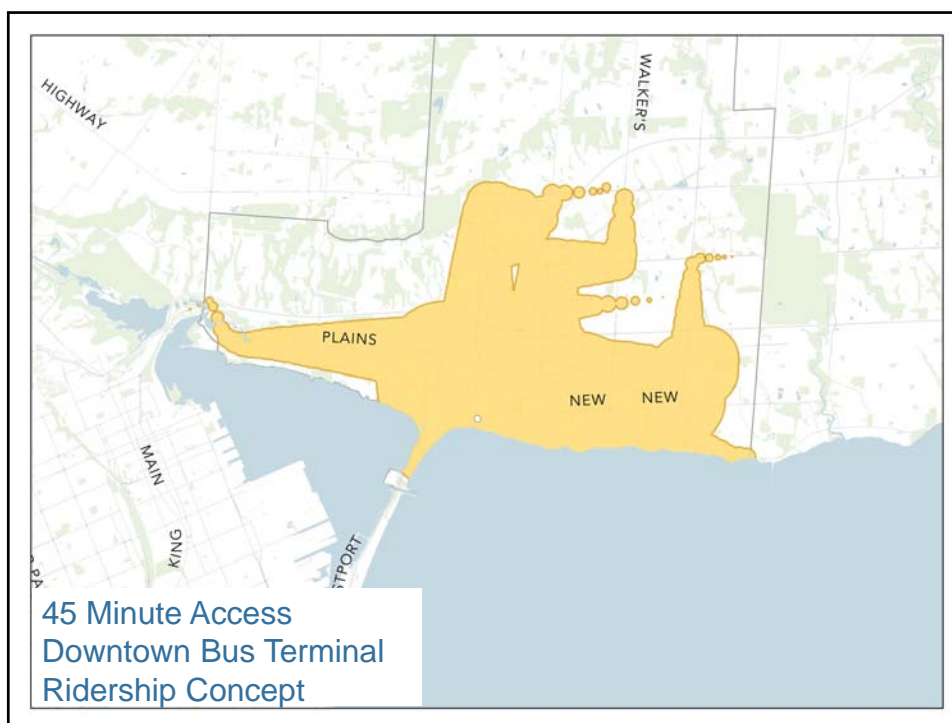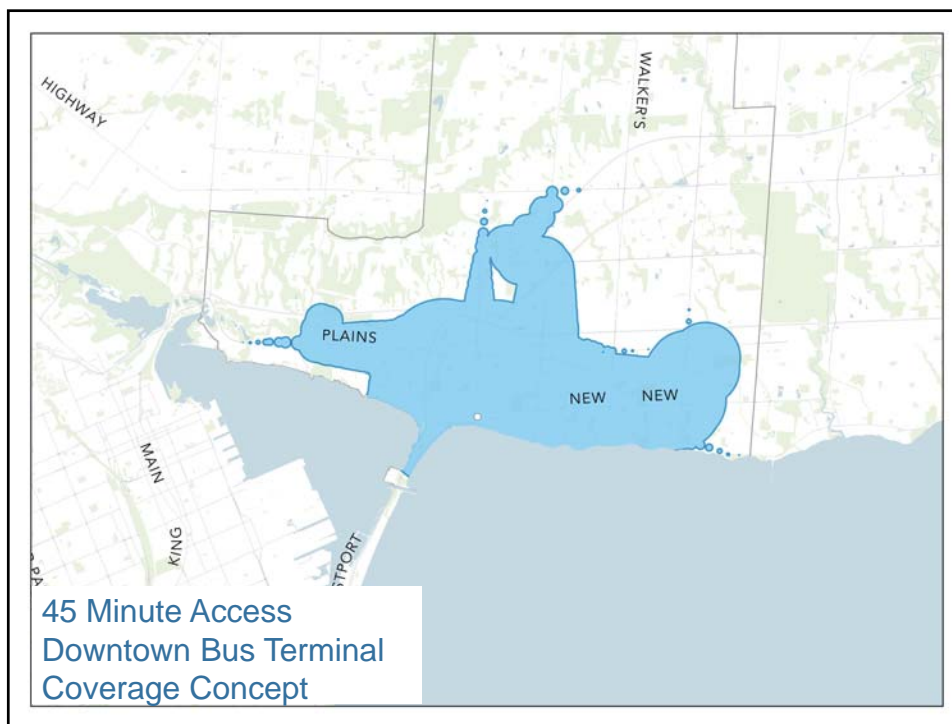
Downtown Change in Access

Time	Concept	Population	% Change	Jobs	% Change
15	Coverage	11,100	-	5,200	-
15	Midpoint	11,000	-1%	5,100	-1%
15	Ridership	11,200	0%	5,200	0%
30	Coverage	48,800	-	17,800	-
30	Midpoint	49,000	0%	18,000	1%
30	Ridership	48,900	0%	20,400	14%
45	Coverage	92,700	-	41,600	-
45	Midpoint	97,100	5%	42,300	2%
45	Ridership	119,800	29%	49,100	18%
60	Coverage	145,200	-	63,200	-
60	Midpoint	162,800	12%	64,900	3%
60	Ridership	171,900	18%	69,000	9%

45 Minute Access
Appleby GO

45 Minute Access
Appleby GO
Coverage Concept

45 Minute Access
Appleby GO
Ridership Concept
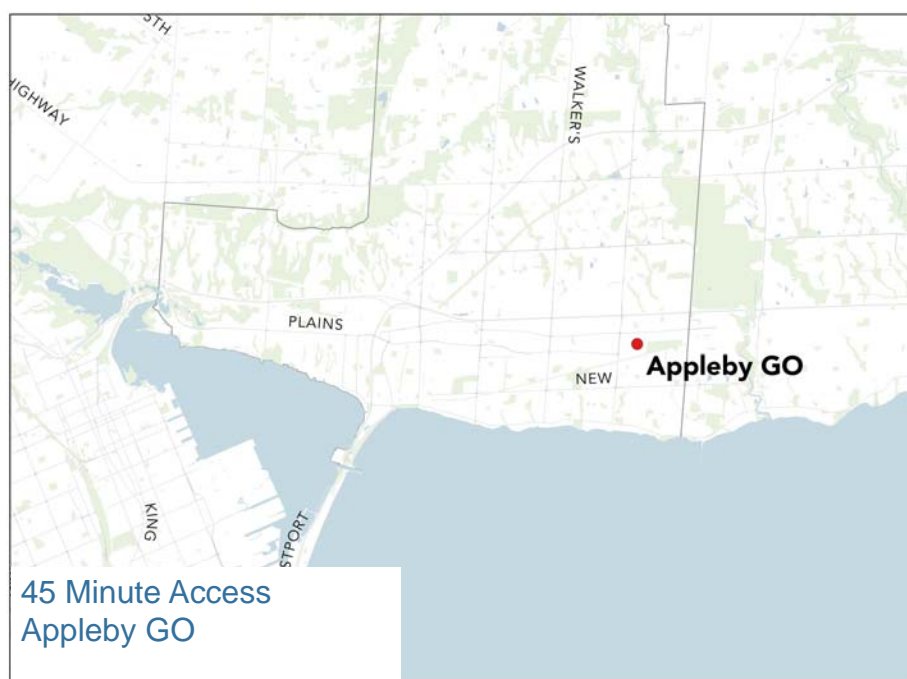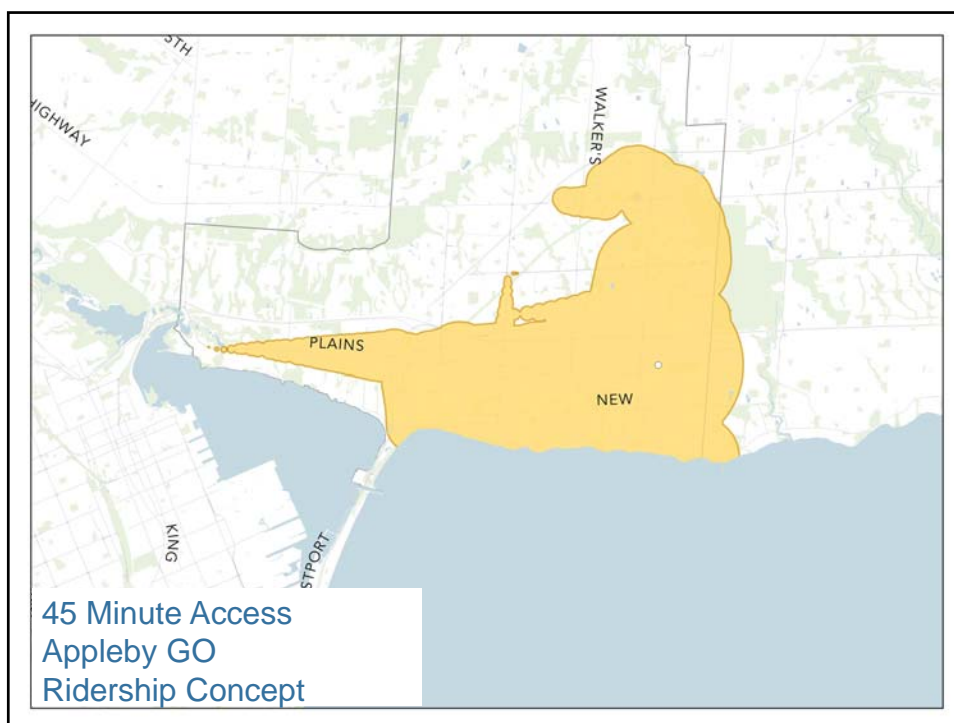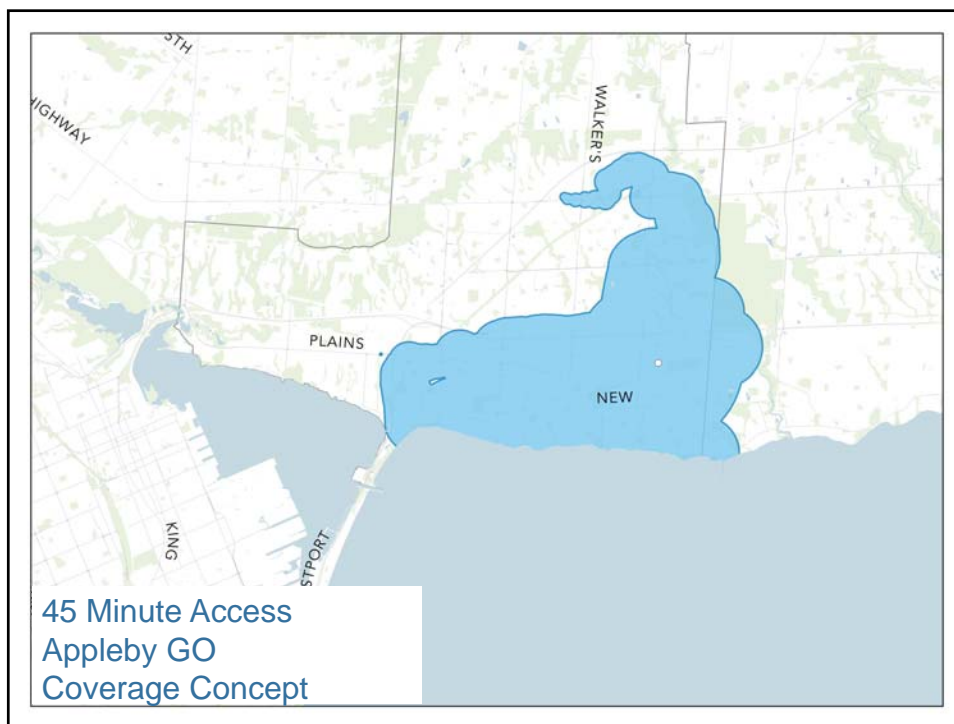
Appleby GO Change in Access

Time	Concept	Population	% Change	Jobs	% Change
15	Coverage	3,700	-	4,400	-
15	Midpoint	4,200	12%	4,700	8%
15	Ridership	4,200	12%	4,800	10%
30	Coverage	42,600	-	26,200	-
30	Midpoint	43,000	1%	27,800	6%
30	Ridership	54,200	27%	31,500	20%
45	Coverage	101,700	-	54,700	-
45	Midpoint	106,900	5%	56,700	4%
45	Ridership	121,600	20%	60,200	10%
60	Coverage	146,200	-	65,700	-
60	Midpoint	171,800	17%	69,300	5%
60	Ridership	170,400	17%	69,200	5%

45 Minute Access
Haber Community Centre

45 Minute Access
Haber Community Centre
Coverage Concept

45 Minute Access
Haber Community Centre
Ridership Concept
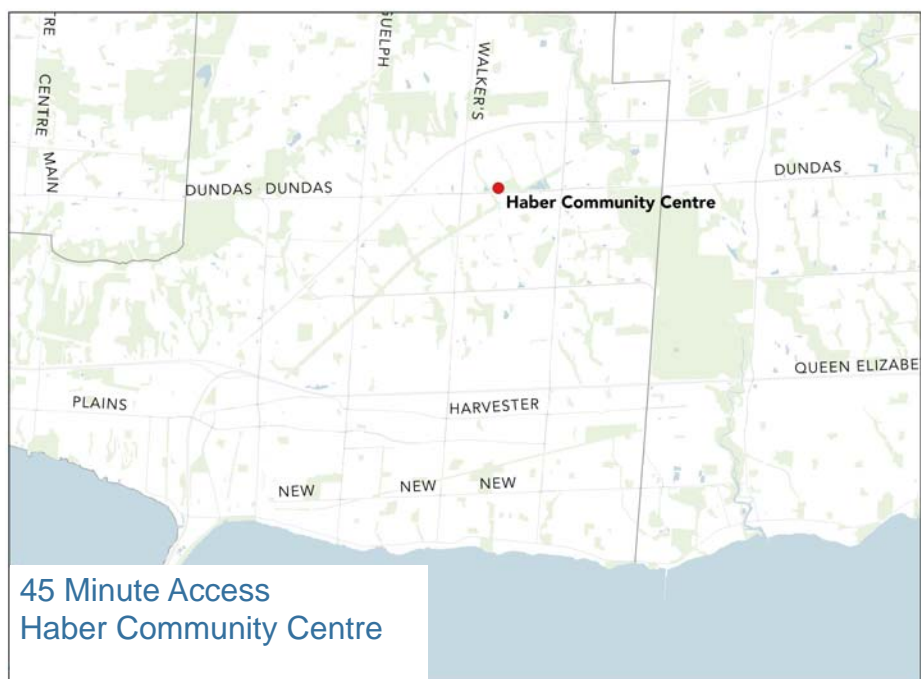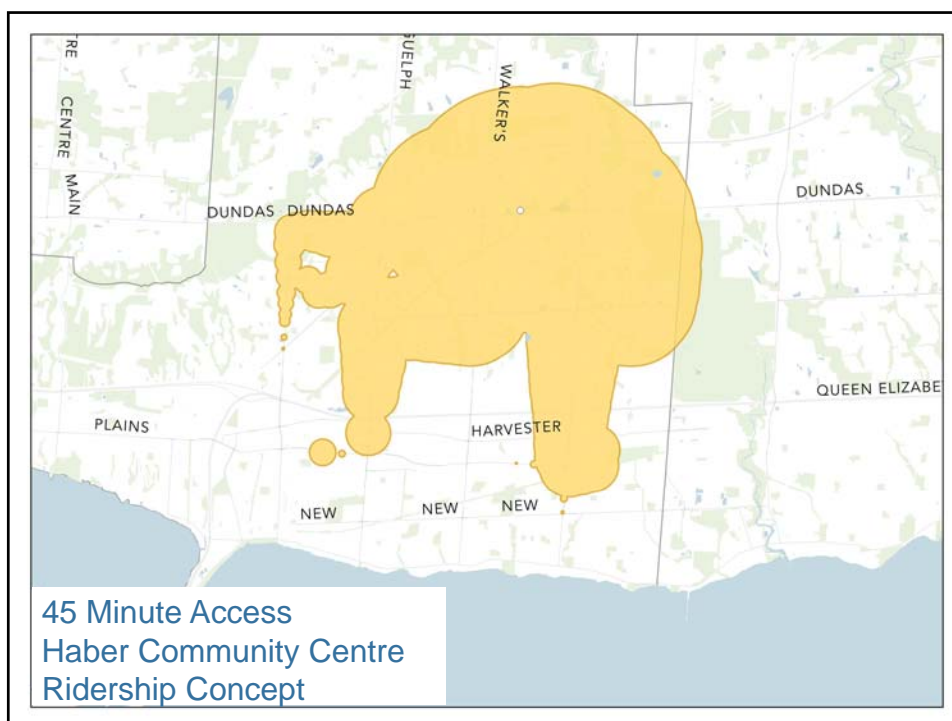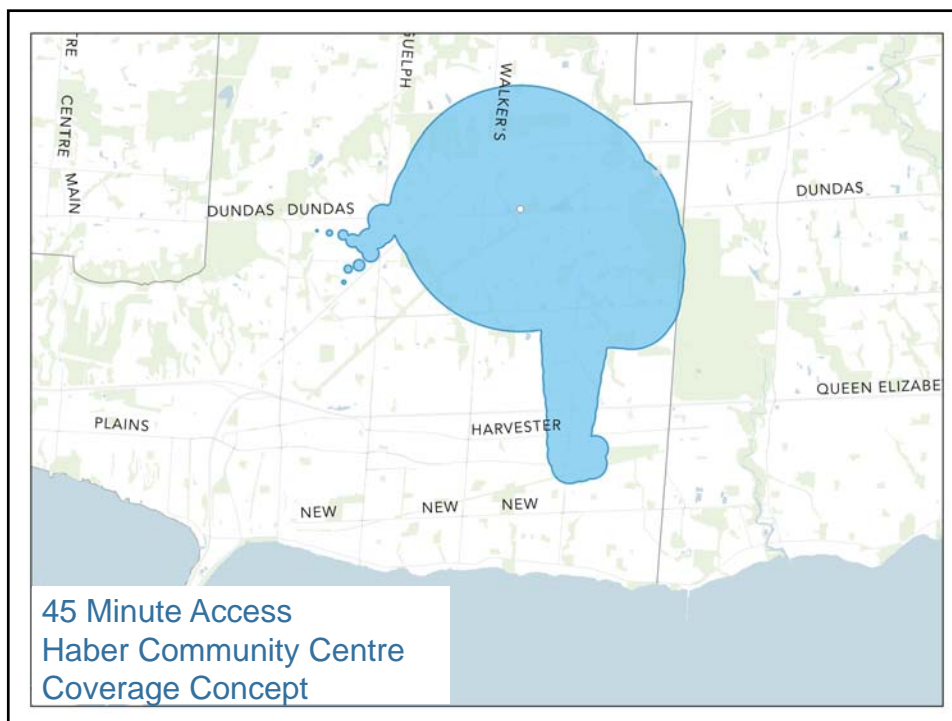
Haber Community Centre Change in Access

Time	Concept	Population	% Change	Jobs	% Change
15	Coverage	8,500	-	600	-
15	Midpoint	8,500	0%	600	0%
15	Ridership	9,800	15%	800	34%
30	Coverage	25,400	-	3,100	-
30	Midpoint	25,800	2%	3,100	0%
30	Ridership	36,400	43%	5,000	62%
45	Coverage	51,900	-	15,100	-
45	Midpoint	69,600	34%	17,300	14%
45	Ridership	81,200	56%	25,100	66%
60	Coverage	102,400	-	38,000	-
60	Midpoint	130,200	27%	54,000	42%
60	Ridership	143,100	40%	59,300	56%

45 Minute Access
Aldershot GO

45 Minute Access
Aldershot GO
Coverage Concept

45 Minute Access
Aldershot GO
Ridership Concept
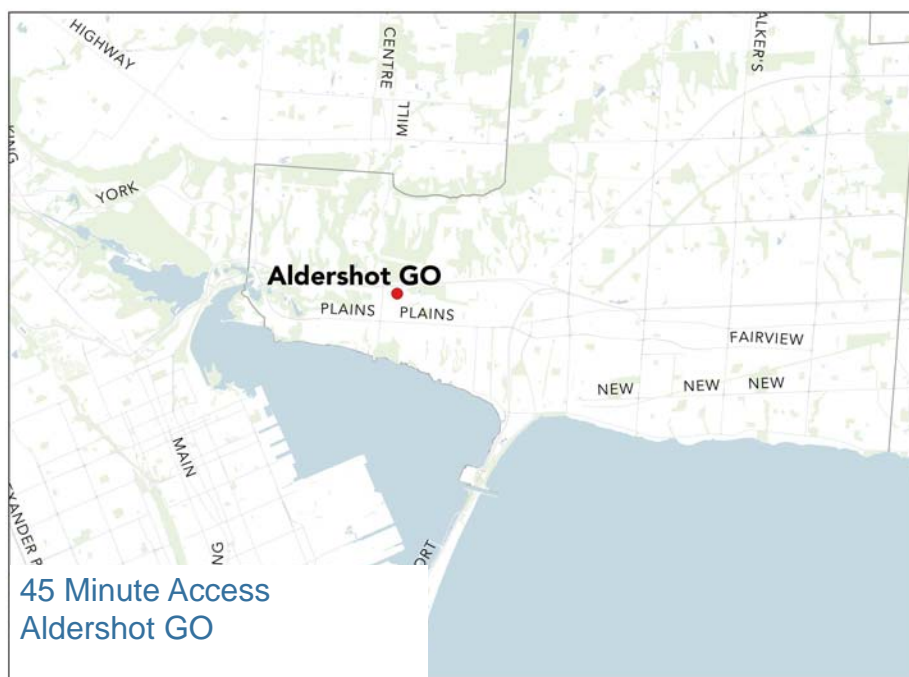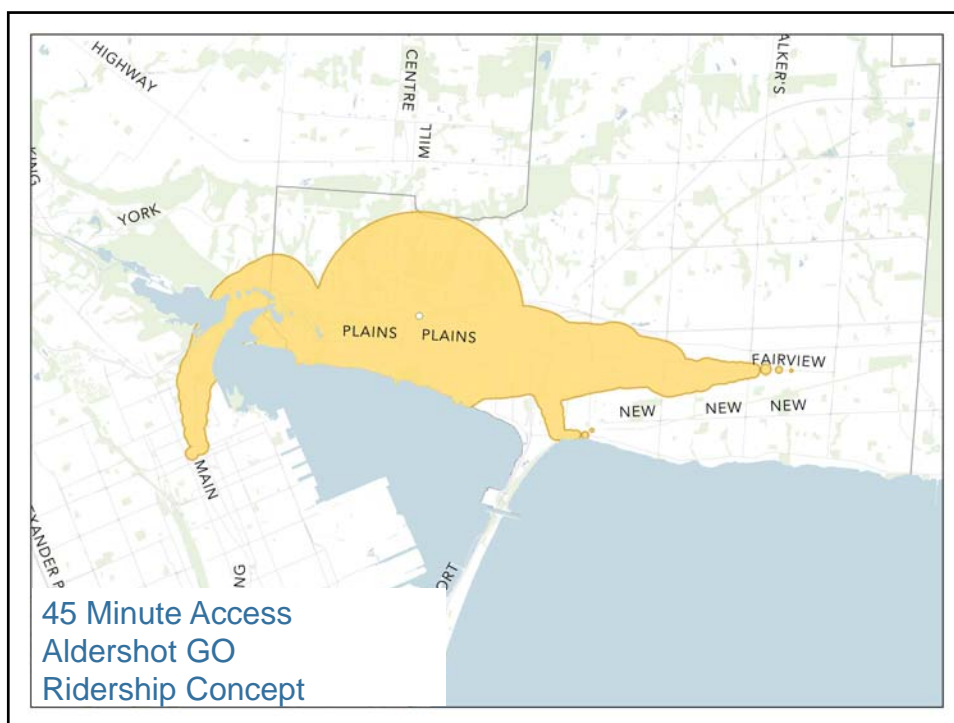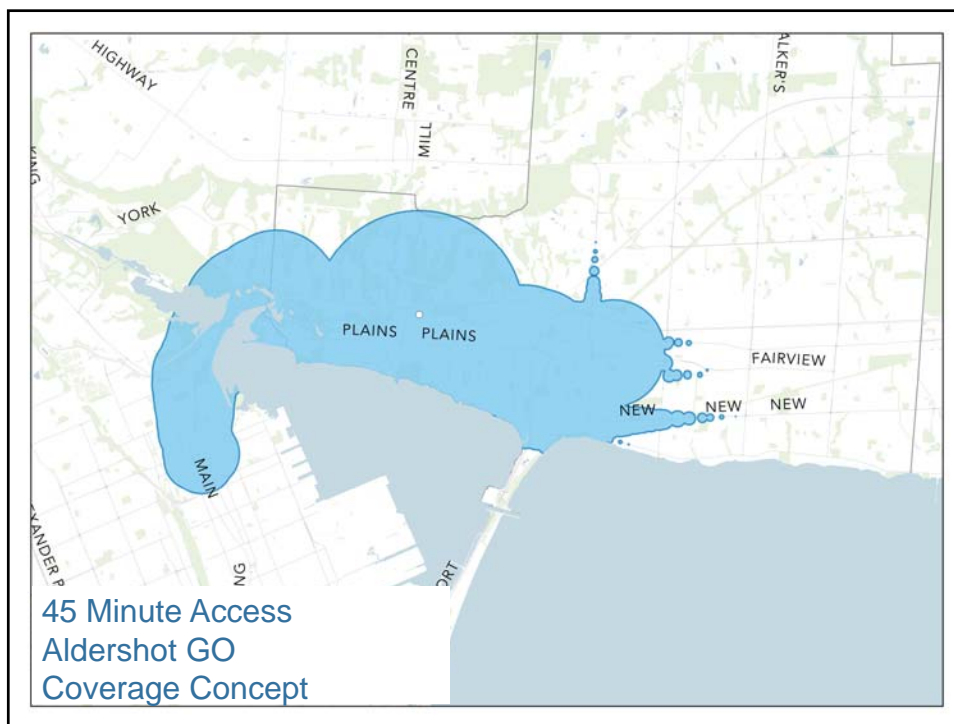
Adlershot GO Change in Access

Time	Concept	Population	% Change	Jobs	% Change
15	Coverage	1,800	-	1,100	-
15	Midpoint	1,500	-15%	1,100	-2%
15	Ridership	800	-56%	1,000	-7%
30	Coverage	20,000	-	6,900	-
30	Midpoint	19,300	-4%	6,900	0%
30	Ridership	11,500	-43%	3,400	-51%
45	Coverage	47,600	-	19,900	-
45	Midpoint	55,400	16%	29,500	48%
45	Ridership	35,100	-26%	16,400	-18%
60	Coverage	94,200	-	43,400	-
60	Midpoint	102,800	9%	49,400	14%
60	Ridership	82,600	-12%	42,900	-1%

45 Minute Access
Appleby & New

45 Minute Access
Appleby & New
Coverage Concept

45 Minute Access
Appleby & New
Ridership Concept
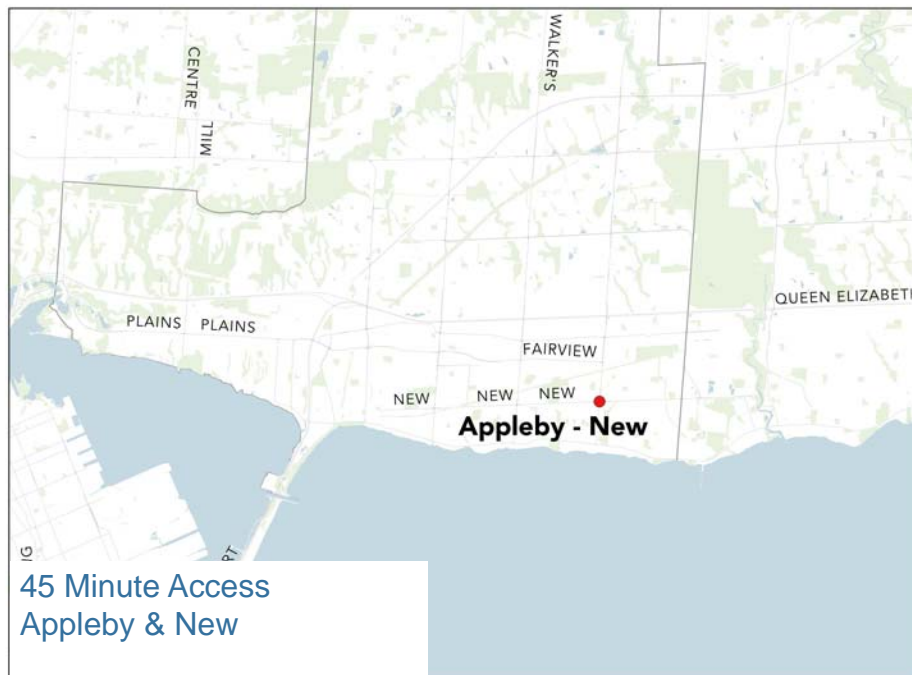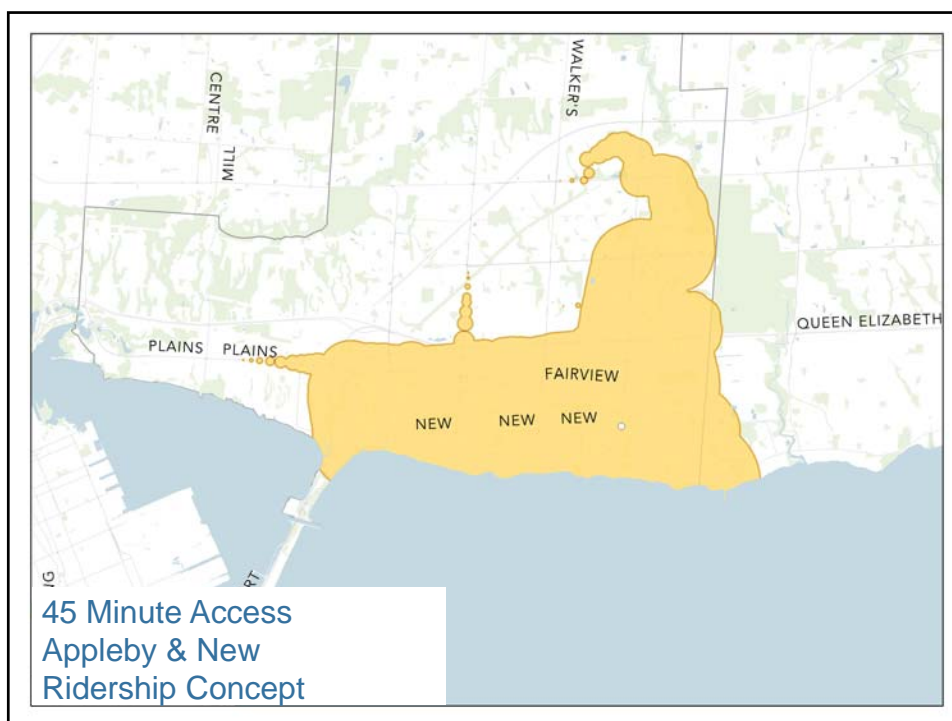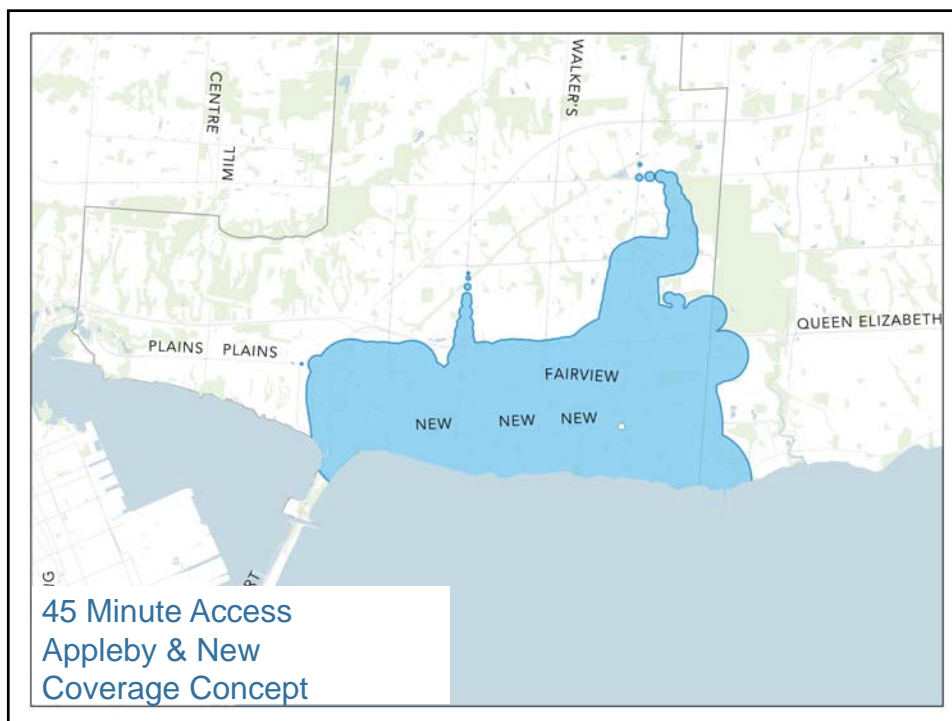
Appleby & New Change in Access

Time	Concept	Population	% Change	Jobs	% Change
15	Coverage	7,900	-	1,700	-
15	Midpoint	7,800	-1%	1,700	-2%
15	Ridership	9,700	23%	2,000	17%
30	Coverage	45,600	-	15,200	-
30	Midpoint	45,100	-1%	16,600	10%
30	Ridership	48,400	6%	20,200	33%
45	Coverage	84,500	-	46,800	-
45	Midpoint	88,400	5%	47,200	1%
45	Ridership	99,000	17%	51,400	10%
60	Coverage	143,700	-	65,800	-
60	Midpoint	152,300	6%	66,700	1%
60	Ridership	158,500	10%	67,800	3%

45 Minute Access
Appleby & Upper Middle

45 Minute Access
Appleby & Upper Middle
Coverage Concept

45 Minute Access
Appleby & Upper Middle
Ridership Concept
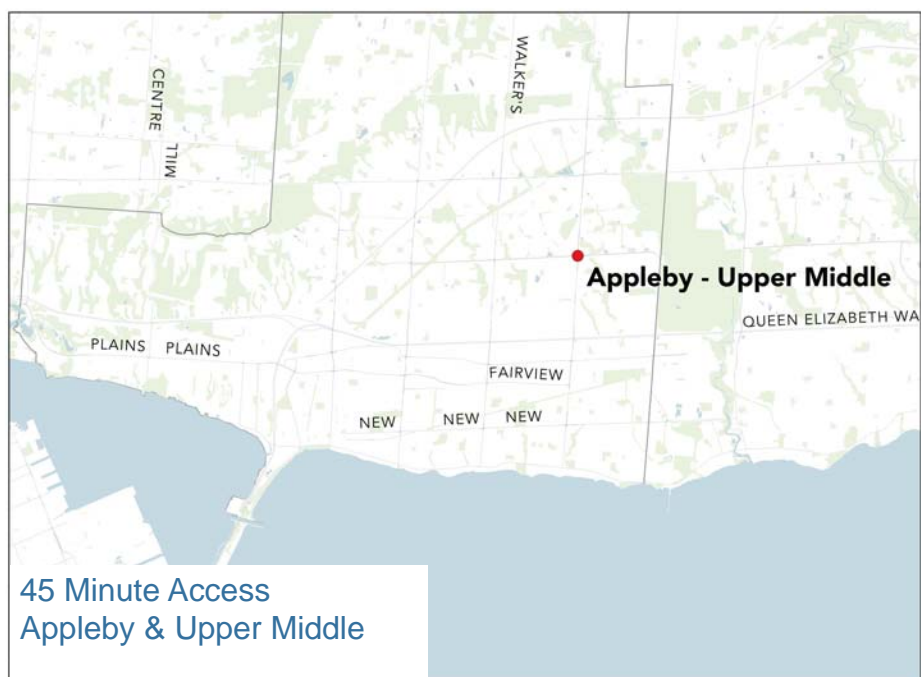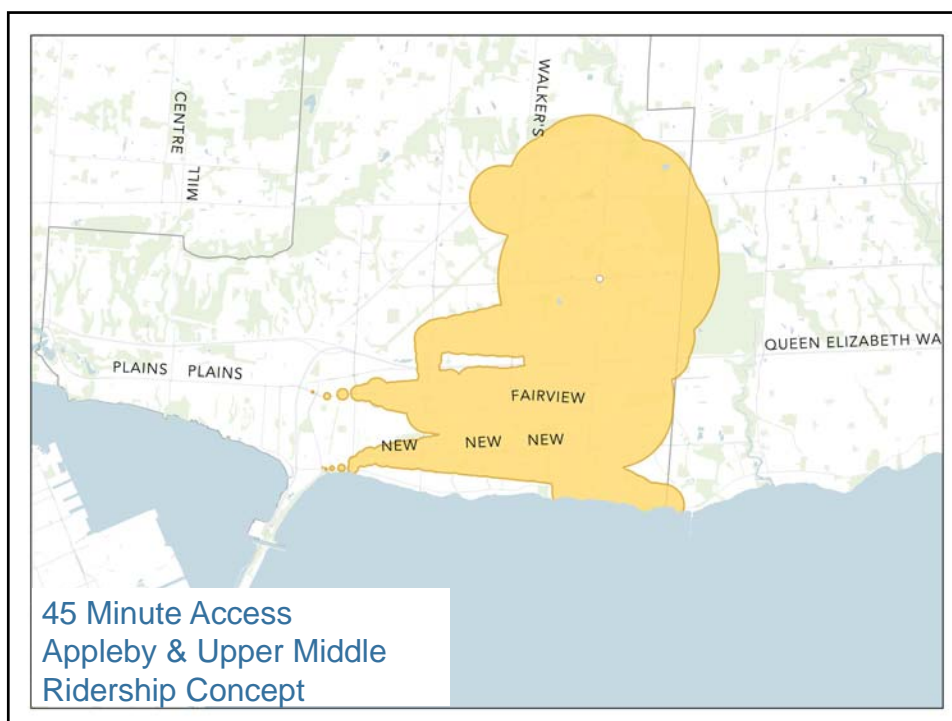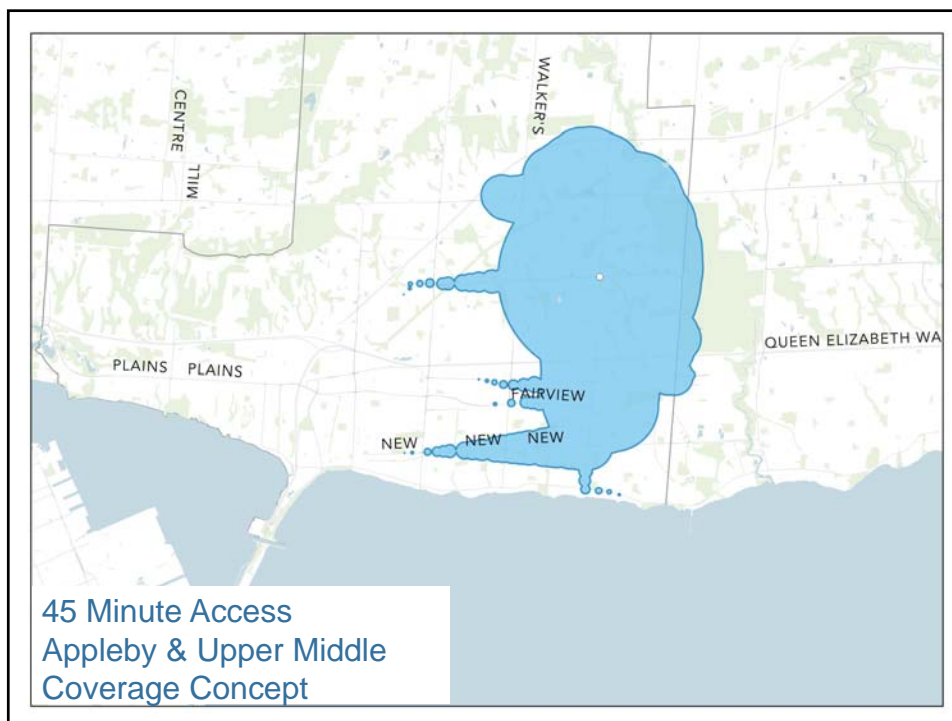
Appleby & Upper Middle Change in Access

Time	Concept	Population	% Change	Jobs	% Change
15	Coverage	4,200	-	2,400	-
15	Midpoint	4,200	0%	2,400	0%
15	Ridership	4,700	12%	3,000	28%
30	Coverage	24,200	-	13,000	-
30	Midpoint	22,900	-5%	12,100	-7%
30	Ridership	36,500	51%	18,000	39%
45	Coverage	67,400	-	29,800	-
45	Midpoint	68,600	2%	31,900	7%
45	Ridership	97,500	45%	48,700	63%
60	Coverage	140,700	-	60,000	-
60	Midpoint	155,300	10%	61,500	3%
60	Ridership	155,600	11%	64,400	7%

45 Minute Access
Hwy 407 GO

45 Minute Access
Hwy 407 GO
Coverage Concept

45 Minute Access
Hwy 407 GO
Ridership Concept
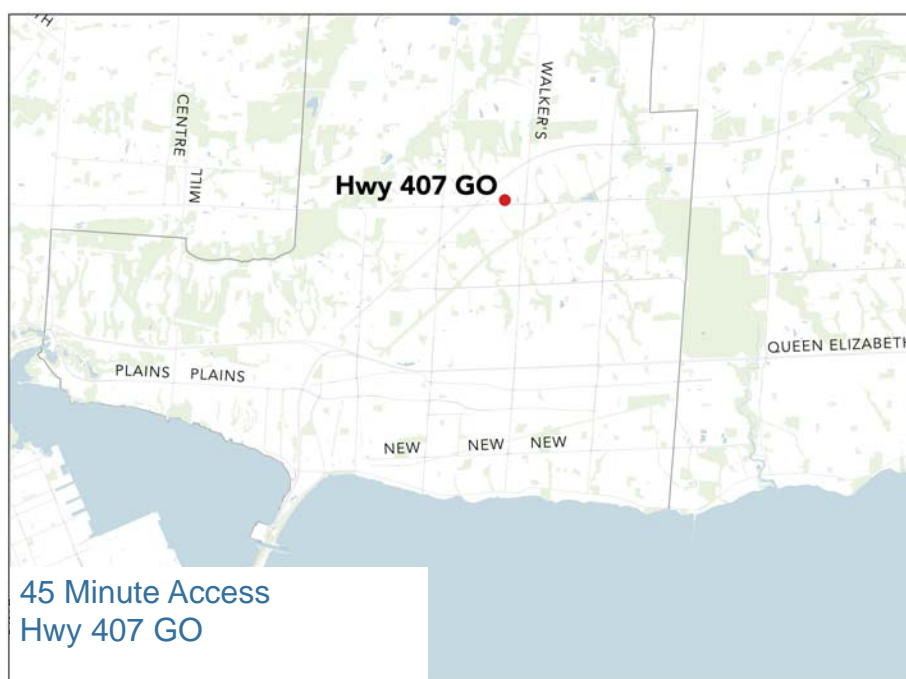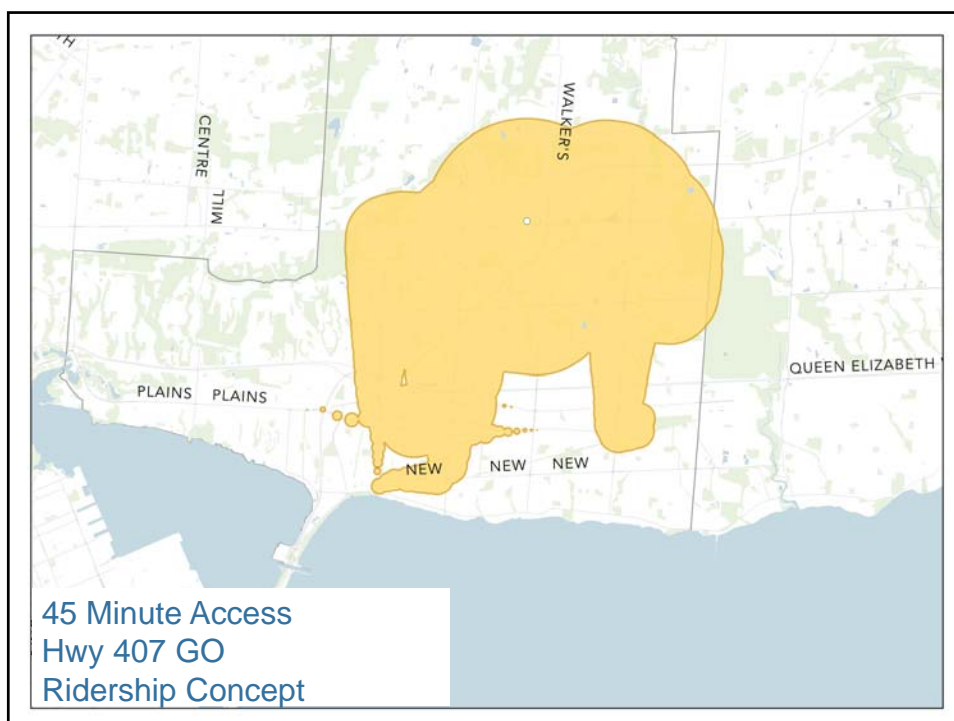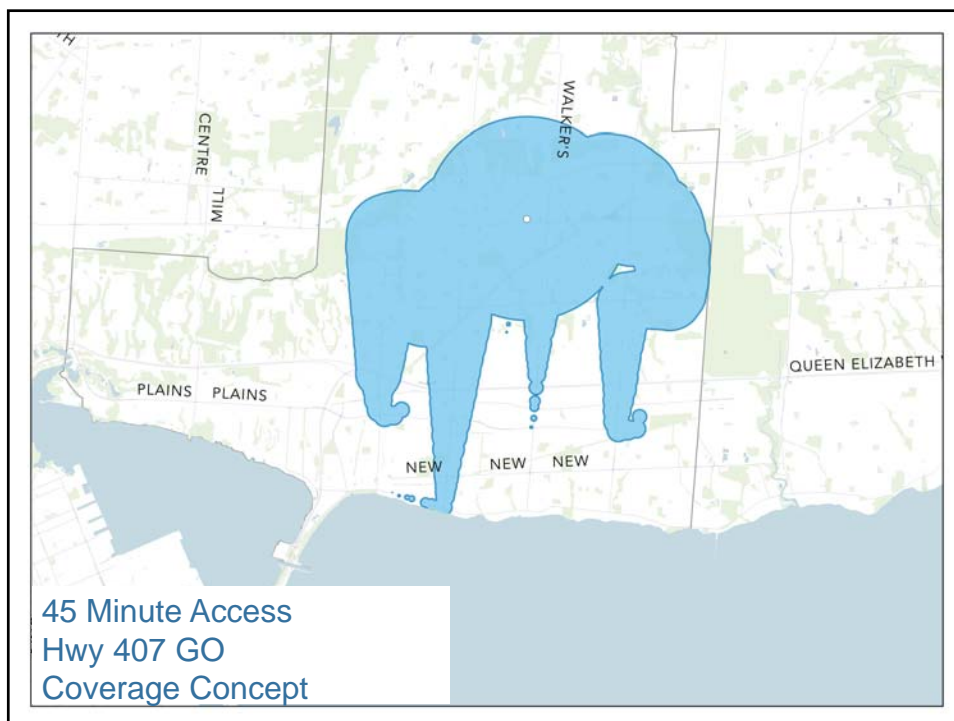
Hwy 407 GO Change in Access

Time	Concept	Population	% Change	Jobs	% Change
15	Coverage	4,500	-	900	-
15	Midpoint	4,500	0%	900	0%
15	Ridership	6,900	53%	1,100	19%
30	Coverage	32,900	-	2,900	-
30	Midpoint	33,000	0%	4,400	50%
30	Ridership	57,300	74%	8,000	176%
45	Coverage	90,000	-	25,200	-
45	Midpoint	91,200	1%	27,500	9%
45	Ridership	107,300	19%	39,300	56%
60	Coverage	145,300	-	62,600	-
60	Midpoint	153,300	6%	62,000	-1%
60	Ridership	162,800	12%	66,200	6%

45 Minute Access
Walkers & Upper Middle

45 Minute Access
Walkers & Upper Middle
Coverage Concept

45 Minute Access
Walker & Upper Middle
Ridership Concept
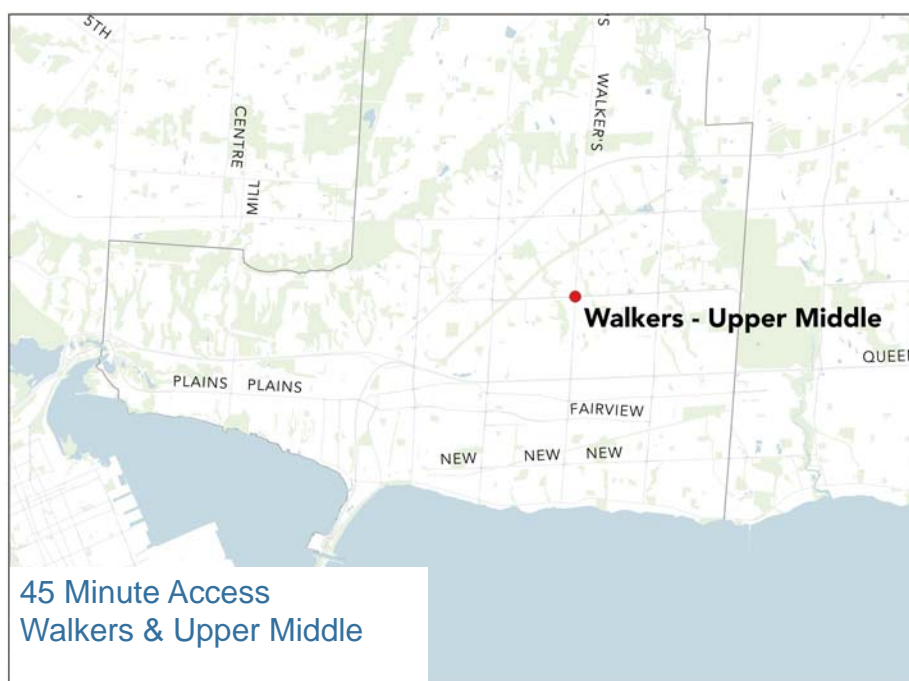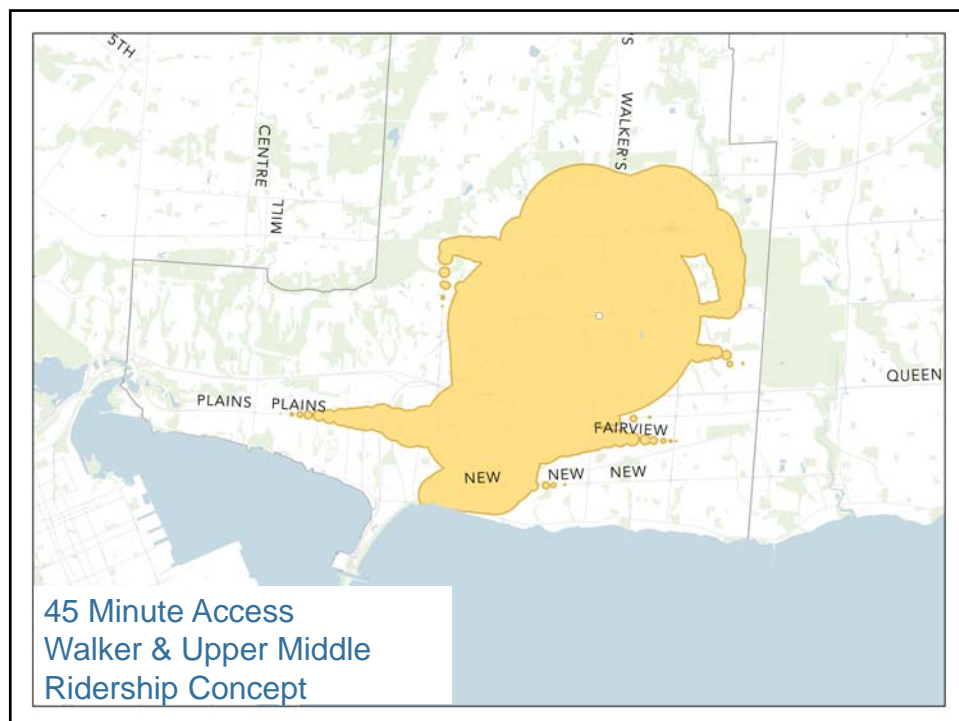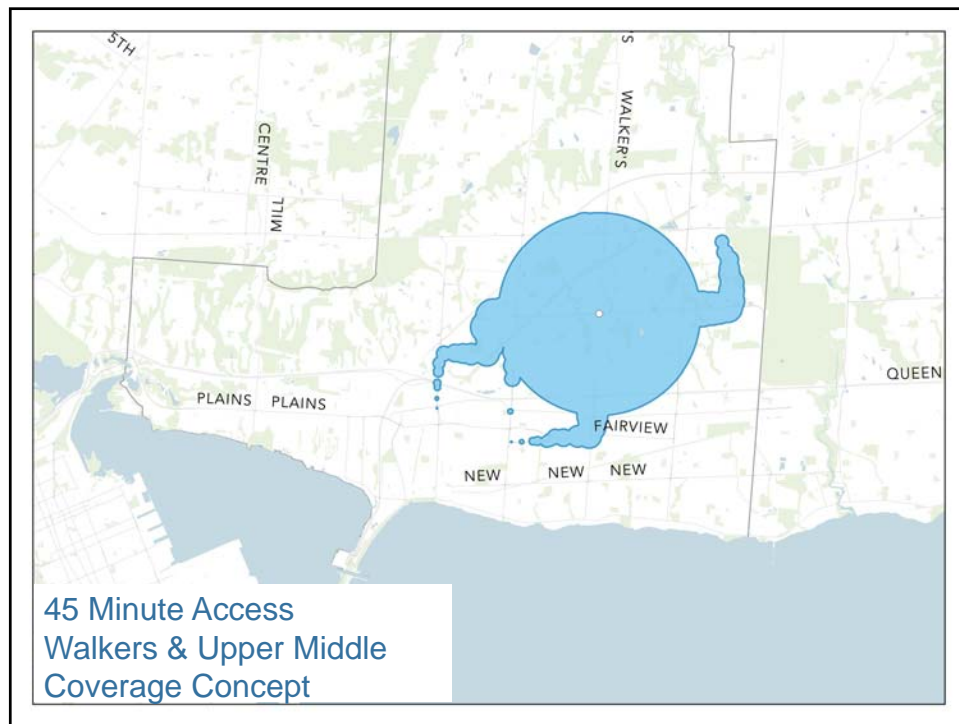
Walkers & Upper Middle Change in Access

Time	Concept	Population	% Change	Jobs	% Change
15	Coverage	7,600	-	1,200	-
15	Midpoint	7,600	0%	1,200	0%
15	Ridership	9,300	22%	1,500	24%
30	Coverage	23,700	-	6,100	-
30	Midpoint	28,100	19%	10,100	65%
30	Ridership	38,900	64%	12,500	105%
45	Coverage	52,600	-	22,400	-
45	Midpoint	70,800	35%	30,200	35%
45	Ridership	102,700	95%	42,100	88%
60	Coverage	105,000	-	46,300	-
60	Midpoint	149,700	43%	62,500	35%
60	Ridership	158,000	51%	66,200	43%

45 Minute Access
Guelph & Prospect

45 Minute Access
Guelph & Prospect
Coverage Concept

45 Minute Access
Guelph & Prospect
Ridership Concept
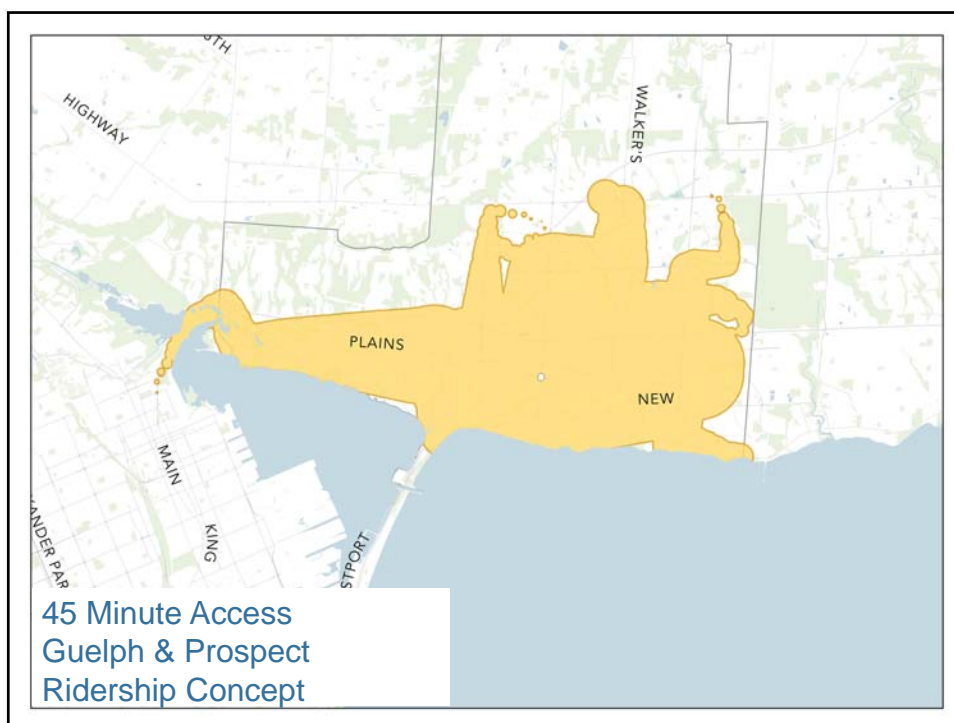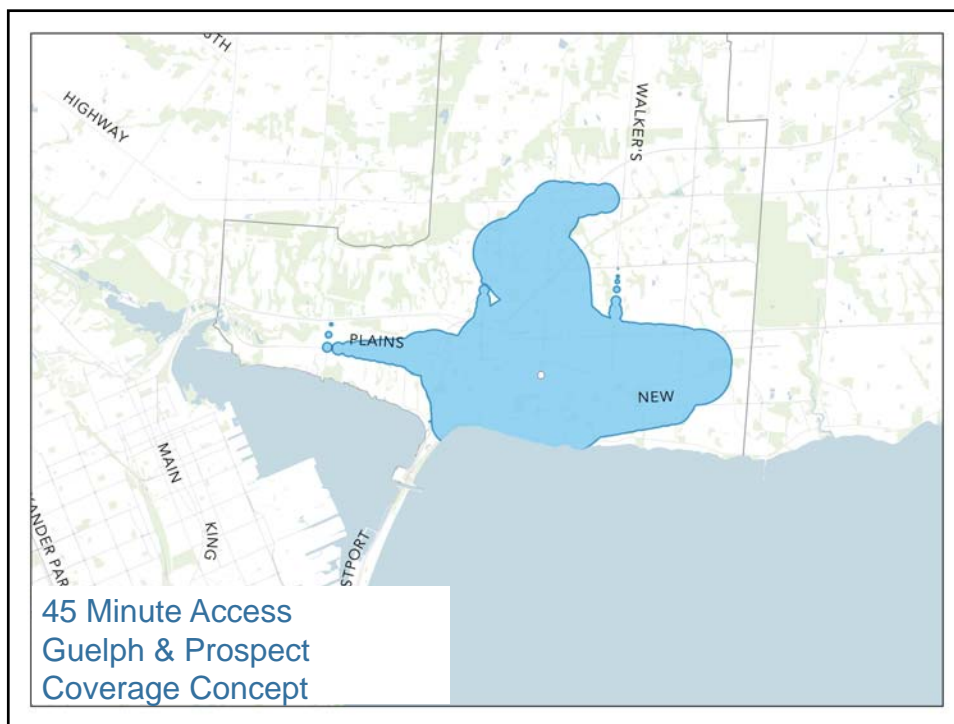
Guelph & Prospect Change in Access

Time	Concept	Population	% Change	Jobs	% Change
15	Coverage	5,400	-	4,100	-
15	Midpoint	6,000	10%	5,100	23%
15	Ridership	7,200	33%	5,400	30%
30	Coverage	32,200	-	21,100	-
30	Midpoint	44,300	38%	29,100	38%
30	Ridership	55,900	74%	32,100	52%
45	Coverage	93,100	-	44,400	-
45	Midpoint	114,800	23%	52,800	19%
45	Ridership	135,600	46%	61,700	39%
60	Coverage	155,300	-	64,700	-
60	Midpoint	168,200	8%	67,900	5%
60	Ridership	177,600	14%	70,100	8%

Next Steps

- Thru Summer 2018: Public Consultation
- Sept 2018: Council Direction on Ridership/Coverage Tradeoff
- Late 2018: Draft Plan and Public Consultation
- Early 2019: Final Plan

Questions

More slides!

What about automation?

…but also a gulf in operating cost.

How low can we go???

Real life example	Rides per hour	Operating cost per hour	Average cost per ride
Fixed route	9.8	$59	$6
Dial-a-ride/paratransit	2.5	$59	$25
"TNC" transit	2.5	$25	$10
Driverless dial-a-ride	2.5	?	?

Driverless Cars → Driverless Buses

- Driverless rapid transit already exists.

- Driverless buses are happening (Europe, China)

- Labor cost is the biggest limit on transit abundance.

- The driverless bus could make bus service *much more abundant.*

Source: PoYang, under CC license.

Why bother with driverless buses when we have driverless cars.

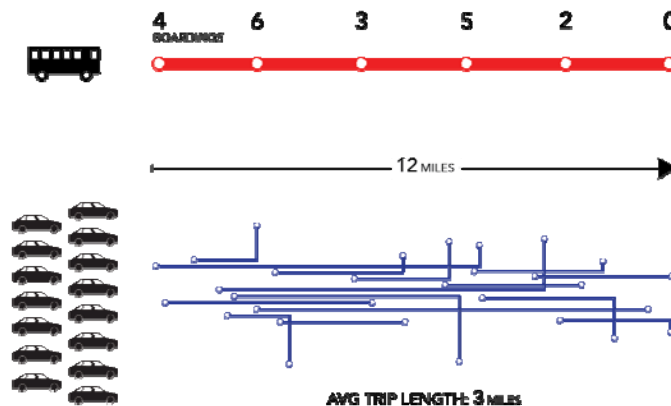| Bus | Driverless cars | Cars with drivers |

What about in the suburbs?

Do you have the space for this?

Local vs Rapid on Plains