2017 Development Charges Update

Development Charges Advisory Committee

October 20, 2016

Agenda

1. Gross Capital Costs
2. Water/Wastewater & Transportation Review (2017-2031)
3. Gross Cost to DC Recoverable Costs:
    i. Water & Wastewater
    ii. Transportation
    iii. General Services

1. Gross Capital Costs

Capital Costs
Gross Capital Costs ($Million's)

Services	2017 DC Study (2017-2031)	2012 DC Study (2017-2031)	Difference
W/WW:			
Water	$ 535.1	$ 379.3	$ 155.8
Wastewater	625.7	365.9	259.7
Sub-Total	$ 1,160.8	$ 745.2	$ 415.6
Roads	$ 2,189.9	$ 1,701.4	$ 488.5
General Services:			
Growth Studies	$ 17.6	$ 16.5	$ 1.1
Police	115.8	27.0	88.8
Paramedic Services	25.5	4.0	21.5
Facilities	11.8	3.5	8.3
Social Housing	95.0	44.0	51.0
Conservation Halton	N/A	29.3	N/A
Waste Diversion	9.8	N/A	9.8
Waterfront Parks	40.1	N/A	40.1
Sub-Total	$ 315.6	$ 124.4	$ 220.5
Total	**$ 3,666.3**	**$ 2,571.0**	**$ 1,124.6**

2. Water/Wastewater & Transportation Review (2017-2031)

Overview

- DC Technical Report Basis of Analysis
- Transportation Technical Review
- Water & Wastewater Technical Review

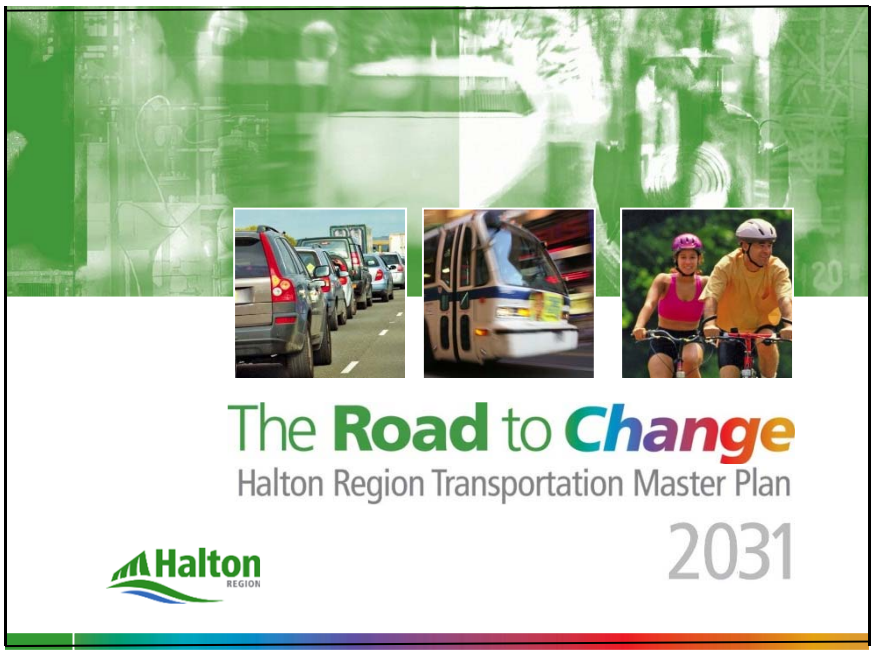
Objective

2017 Development Charges Technical Reports

- Provide the basis for developing the costs and capital implementation plan for water, wastewater and transportation projects required to service population and employment growth across Halton Region (2017 – 2031)
- The Halton Region Best Planning Estimates (BPE) were used as the basis for growth projections
- Capital implementation plan (i.e. timing) will be further refined during development of the Infrastructure Staging Plan and Allocation Program

Basis of Analysis

2011 Infrastructure Master Plans:



Transportation Technical Review

Technical Review of transportation network and projects (2011 TMP) included:

- Updating the transportation demand forecasting model with current travel pattern characteristics (2011 TTS)
- Reviewing existing and future transportation network screenline capacities to 2031
- Validating the long range Transportation Capital Implementation Plan to 2031 (i.e. project scope, timing, need and cost)

Review Results

The results of the technical review were incorporated into the 2017 Development Charges Transportation Technical Report. The main outcomes were:

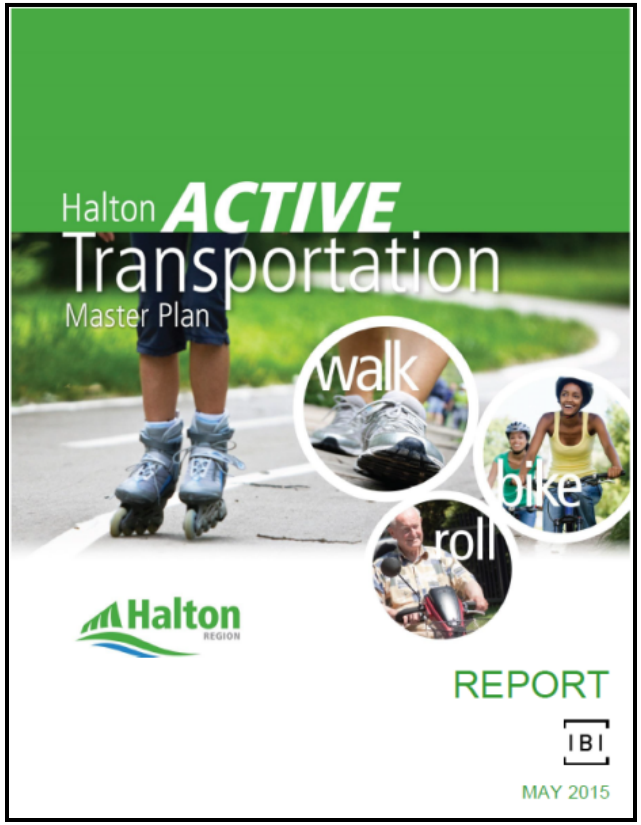
- Updated travel demand forecasting model outputs resulted in no change in capital project needs
- Inclusion of new off-road and infill active transportation Infrastructure into DC capital program to complement planned on-road AT infrastructure (within Regional R-O-W).
- Minor reprogramming of transportation capital projects.
- Updated project costing

Active Transportation Infrastructure

Council endorsed 2015 Active Transportation Master Plan (to 2031) through PW 17-15:

- Inclusion of new off-road AT infrastructure (~ **$36.5 M**) and AT infill projects (~ **$6.1 M**) within Regional R-O-W

Complements planned on-road active transportation infrastructure (~ **$40.6 M**) within Regional R-O-W



Transportation Project Reprogramming

Some projects from 2011 TMP were reprogrammed based on the following:

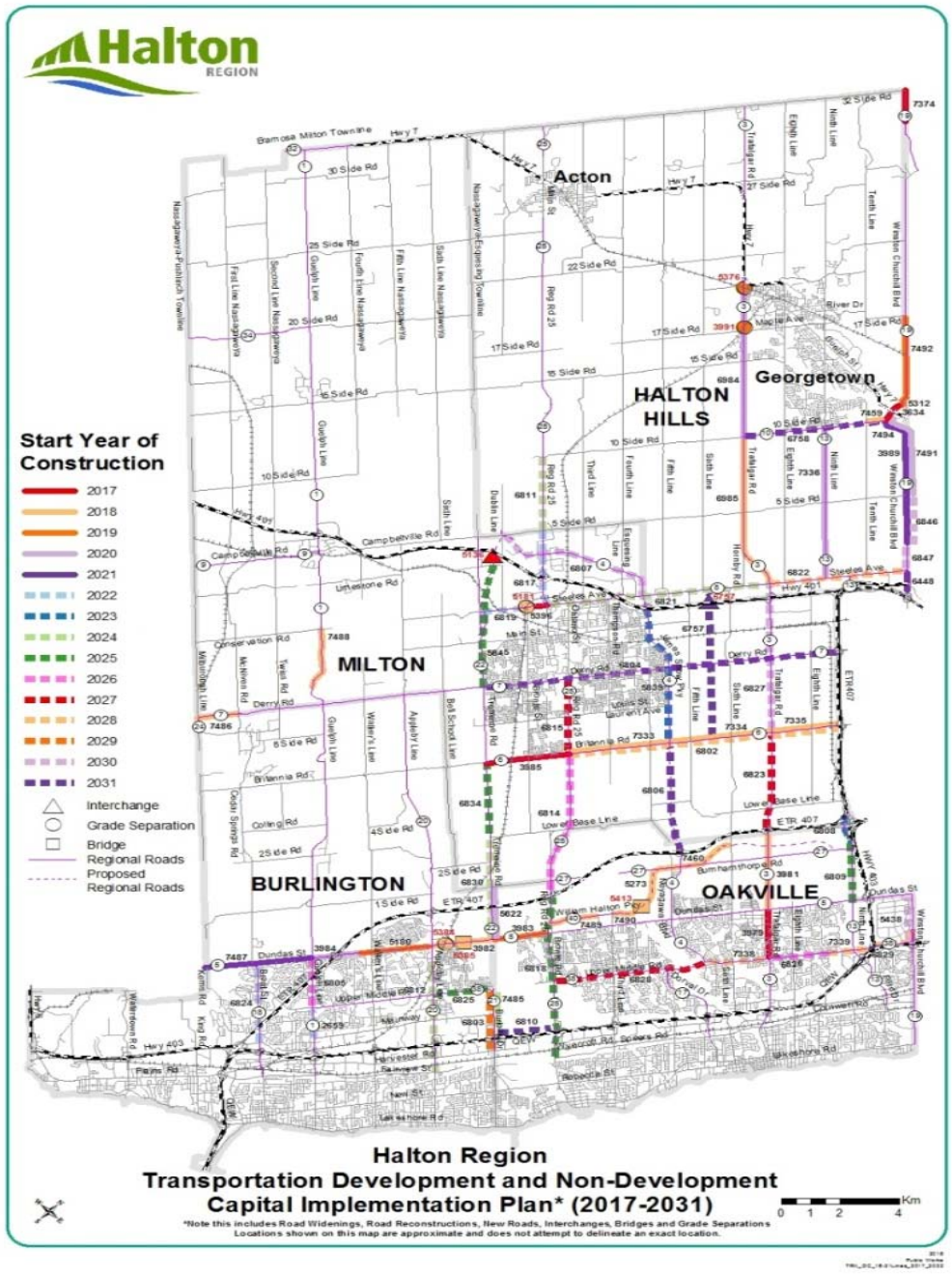
- Delays in Municipal Class Environmental Assessment process review and approval timelines
- Property acquisition, development coordination, additional natural environment investigation and review agency approval requirements
- Overall co-ordination of Municipal Class Environmental Assessment Studies with local municipal planning studies / initiatives
- Harmonization of road capital works with other Regional infrastructure works (i.e. water, wastewater, road and intersection improvements) within common road corridors

Updated Transportation Project Costing

- 2011 TMP capital project scope and costing was updated using more recent information from more detailed evaluations (MCEA study, Detailed design, Peel Region-led studies i.e. WCB).
- Where project costing was still derived from benchmarking, costs were updated through an indexing of the cost estimate per the 2012 DC Program to January 1, 2017.
  - Benchmarked projects indexed 6.9% from 2011 project cost (2012 DC Transportation Technical Report)
  - Non-benchmarked projects (MCEA's, Engineering design, etc.) indexed by 1.7% from 2015

Transportation Capital Program

- Overall Transportation development and non-development capital program from 2017 to 2031 is estimated at **~$2.2 B ($ 2017)**



2017-2031 Capital Program Cost Comparison

Road Program Cost ($millions)	Per 2017 DC Study (2017 - 2031)	Per 2012 DC Study (2017 - 2031)
	$ 2,189.9	$ 1,701.4
Drivers for Increase:		
MCEA/Detailed Design	$ 73.2	Reflect results of MCEA studies and detailed designs
Revised Cost Estimates	$ 78.3	Based on updated benchmarks and indexing from 2012 to 2017 cost
New projects	$ 9.8	Additional intersection improvements
ATMP Projects	$ 83.2	Implement Active Transportation Master Plan
Projects removed	$ (42.1)	Mainly resulting from road resurfacing and Campbellville Road reconstruction
Reprogramming	$ 286.0	moved the projects previously identified between 2012 and 2016 to align timing of projects with expected growth
Total	**$ 488.5 M**	**Program Increase**

Water & Wastewater Technical Review

Technical Review of water & wastewater system network and projects (2011 SHWWWMP) was completed by:

- Identifying opportunities to optimize water infrastructure (water pressure zone 3,4,5 in Oakville and Milton) and wastewater infrastructure (i.e. core of Milton, Acton and west area of Burlington)
- Updating water and wastewater hydraulic models
- Re-analysis of water and wastewater design criteria
- Validating the long range water & wastewater capital implementation plan to 2031 (i.e. project scope, timing, need and cost)

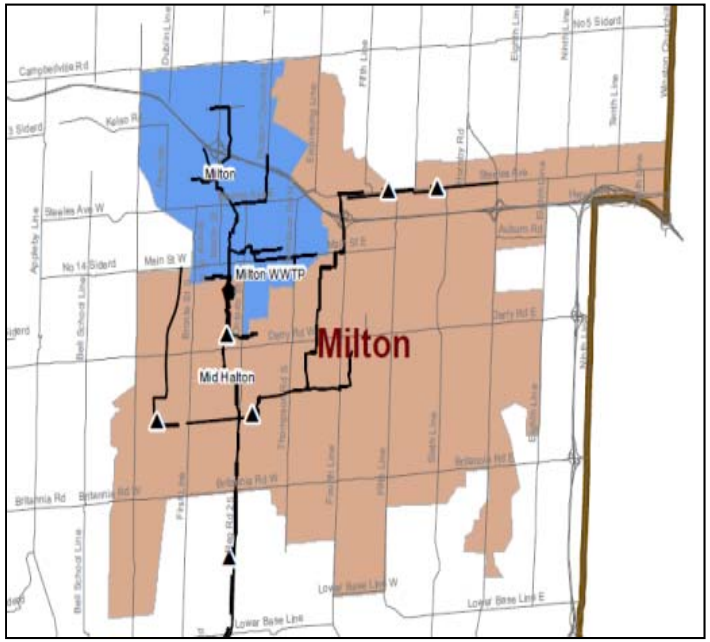
Review Results

Results of the Technical Review were incorporated into the 2017 Development Charges Water & Wastewater Technical Report. The main outcomes were:

- Realignment of water pressure zone boundaries (Zones 3,4,5) to optimize water pressure in these areas to support growth
- Revised wastewater flow diversion strategy in Burlington's west wastewater system - eliminated need to upsize the Grandview WWPS and its associated inlet sewer
- Revised wastewater flow diversion strategy for Milton (Milton WWTP to Mid-Halton WWTP)

Revised Milton Wastewater Servicing Strategy – Decommission Milton WWTP

- 2011 MP long-term strategy:
  - Part of Milton's WW treated at Milton WWTP (Steady State)
  - Remainder (mostly greenfield development) of wastewater already diverted to Mid-Halton WWTP
- Aging Milton WWTP needs major SOGR reinvestment
- Servicing strategy revised:
  - Divert all Milton WW flows to Mid-Halton WWTP beginning 2021
  - Decommission Milton WWTP; cost of major rebuild is avoided
  - Life cycle cost of new strategy lower than keeping Milton WWTP in operation



Review Results

Other technical review results and main outcomes:

- Updated water/wastewater per capita design criteria
- Revision of timing requirements for some major water & wastewater capacity infrastructure projects
- Reprogramming of some linear water/wastewater infrastructure to service development areas (Boyne West, North Oakville East, Derry Green – Phase II and Highway 407 West Employment areas) which did not proceed as originally planned in the 2011-2016 timeframe

Updated W/WW Design Criteria

WATER	Design Criteria
Average Day Water Demand: **RESIDENTIAL** (lpd/c): **EMPLOYMENT -** Blended ICI (lpd/emp):	 **265** **225**
Peaking Factor: **Maximum Day** (Lake-based): **Maximum Day** (Groundwater): **Peak Hour** (Groundwater / Lakebased):	 **1.9** **1.6** **3.0**

WASTEWATER - PLANTS	Design Criteria
Average Day Flow: **RESIDENTIAL** (lpd/c): **EMPLOYMENT** -Blended ICI (lpd/emp)	 **360** **310**

WASTEWATER - SYSTEM	Design Criteria
Dry Weather Average Day Flow: **RESIDENTIAL** (lpd/c): **EMPLOYMENT -** Blended ICI (lpd/emp)	 **215 x PF** **185 x PF**
I/I Allowance:	**0.286 l/s/ha**

Updated Water/Wastewater Project Costing

- Timing of projects reprogrammed due to:
  - Servicing strategy changes
  - Updated water/wastewater design
  - Harmonization of capital works with other Regional infrastructure works (i.e. pipes, roads and intersection improvements) within common corridors
  - Unrealized actual development uptake in some areas within 2011-2016 timeframe

Significant Capital Projects

Water:

- Oakville WPP(Ph III) & Burloak WPP(Ph II) Reratings
- Georgetown Lake-based Booster Pumping Station and Feedermain (Zone 6)
- Georgetown Lake Based Storage Reservoir and Feedermain (Zone 6)
- Georgetown Groundwater to Lake-based Servicing Transfer
- Zone 4 Reservoir Expansion
- Oakville/Milton Water Pressure Zone Realignment (Zones 3,4,5) and alterations to Eighth Line, Fourth Line, Neyagawa Booster Pumping Stations
- Boyne East Britannia Trunk Watermain
- 407 West Employment Area Trunk Watermain
- Burloak Zone 2 Booster Pumping Station, Feedermain and Wyecroft Trunk Watermain
- Kitchen & Neyagawa Booster Pumping Station Expansions

Wastewater:

- Mid-Halton WWTP – Phase VI / VII Expansion
- Georgetown 8th Line/Trafalgar Rd Trunk Sewer
- Britannia Road Wastewater Pumping Station, Twinned Forcemain, East Trunk Sewer
- Boyne West Internal Trunk Sewer
- Maple Avenue Trunk Sewer
- Skyway Wastewater Treatment Plant Inlet Sewer Upsizing
- West River, Junction Street, and Agnes Street Wastewater Pumping Station Upgrades
- Tremaine Road Wastewater Pumping Station and Forcemain
- South Milton Fourth & Fifth Line Trunk Sewers
- Lower Baseline Wastewater Pumping Station and Twinned Forcemain
- Wastewater Pumping Station Expansion at Mid-Halton Wastewater Treatment Plant
- Mid-Halton Wastewater Treatment Plant – Phase VIII / IX Expansion (Design only)

Updated Water/Wastewater Project Costing

2011 SHWWMP capital costing was adjusted to January 1, 2017 dollars using the following approaches:

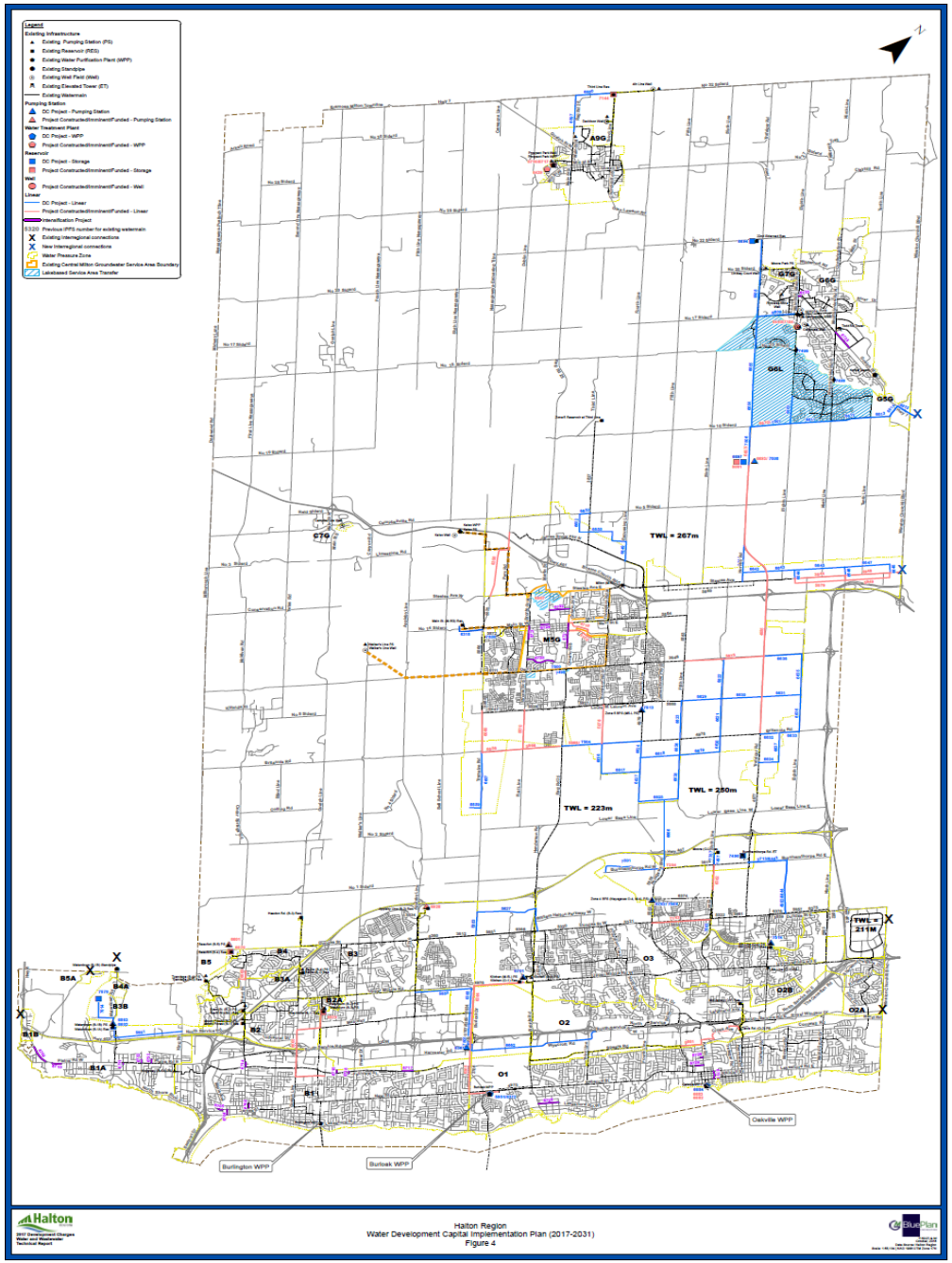
- Capital project scope and costing was updated using more recent information from more detailed evaluations (MCEA study, detailed design) since 2011 and applied, where possible, throughout the 2017-2031 capital forecast.

- For projects identified within the 2017-2022 capital forecast, project costing was adjusted to reflect updated benchmarking unit costs (based on recent tender information) which are representative of estimated costs to construct as of Jan 1, 2017.

- For identified projects within the 2023 to 2031 capital forecast, 2011 project costs were indexed 6.9% from 2011 project cost (2012 DC Water & Wastewater Technical Report).

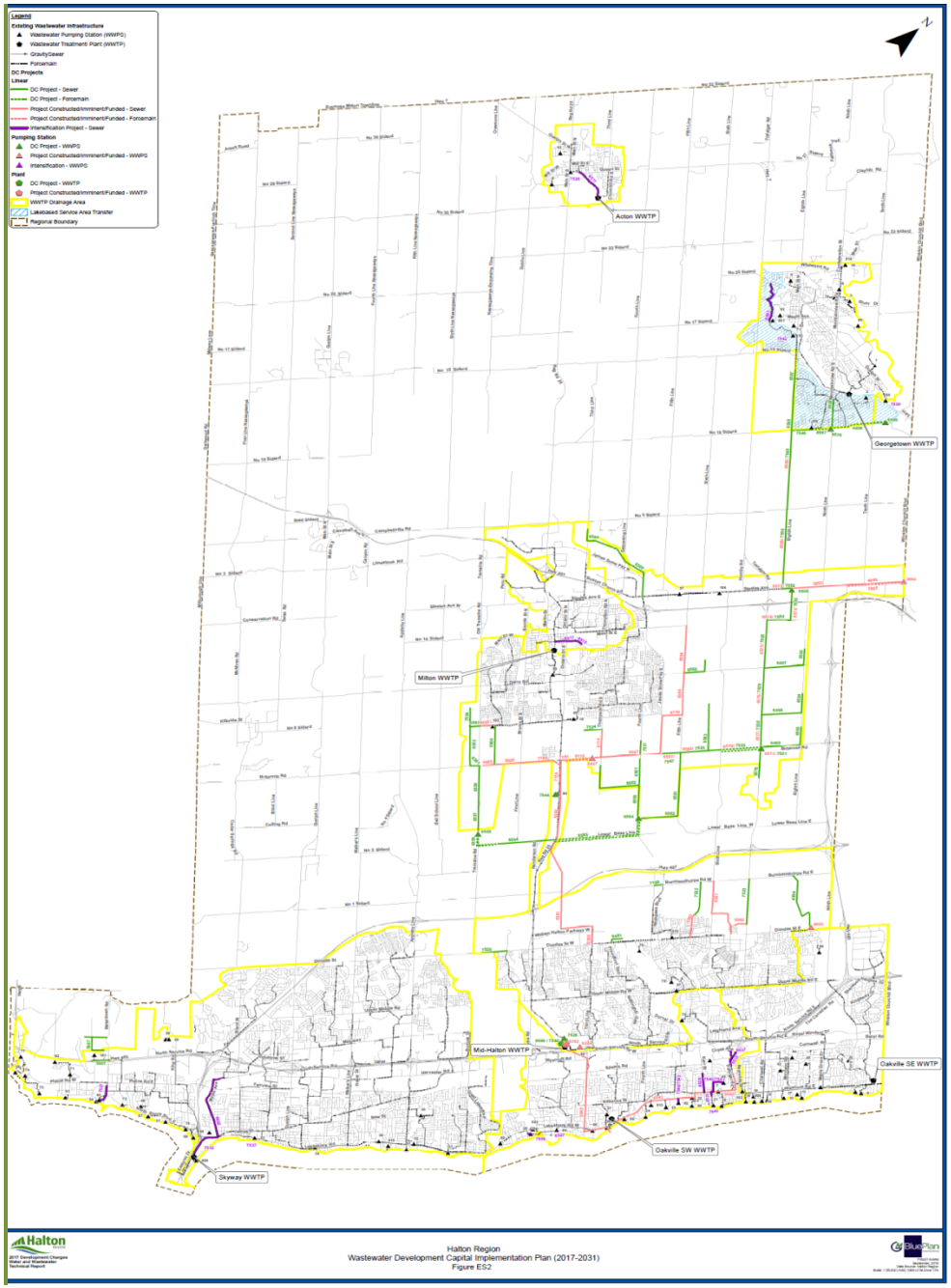
Water Capital Program

- Overall Water development capital program from 2017 to 2031 is estimated at **~$535 M ($ 2017)**



Wastewater Capital Program

- Overall Wastewater development capital program from 2017 to 2031 is estimated at **~$626 M ($ 2017)**



2017-2031 Capital Program Cost Comparison

W/WW Program Cost	Per 2017 DC Study (2017-2031)	Per 2012 DC Study (2017-2031)
($million's)	**$ 1,160.8**	**$ 745.2**
Drivers for Increase:		
MCEA/Design	$ 78.0	Reflect results of MCEA studies and detailed design
Revised Cost Estimates	$ 96.6	Based on updated benchmarks and indexing from 2012 to 2017 cost
New projects	$ 117.4	Mainly resulting from Zone 3,4,5 realignment, North WWPS expansion, and new sewer inlet to Skyway WWTP
Projects Removed	$ (180.6)	Mainly resulting from system optimization (Burlington) and deferral of Burloak Water Purification Plant III Expansion to post 2031
Scope Change	$ 76.5	Mainly resulting from Lower Base Line Forcemain construction method change and Zone 2 Interconnecting Watermain design change
Reprogramming	$ 227.7	Moved projects previously identified between 2012 & 2016
Total	**$ 415.6 M**	**Increase**

3. Gross Cost to DC Recoverable Costs

Gross Cost to DC Recoverable Cost Water and Wastewater ($000's)

Category	Gross Cost 2017-2031	Less: Non-Growth (BTE)	Less: Post Period Benefit	Net Growth	Residential	Non Residential
Capacity						
Treatment/Plants	$ 270,337	$ 37,912	$ 18,000	$ 214,425	$ 160,190	$ 54,235
Pumping Stations/Reservoir	44,291	12,250	-	32,041	23,921	8,120
Major Trunk	75,204	23,150	-	52,054	38,655	13,399
Studies	10,475	-	-	10,475	7,802	2,673
Sub-total	$ 400,307	$ 73,312	$ 18,000	$ 308,995	$ 230,568	$ 78,427
Other Distribut'n & Collect'n	760,494	33,932	43,597	682,965	506,741	176,224
Total	$ 1,160,801	$ 107,244	$ 61,597	$ 991,960	$ 737,309	$ 254,651

W&WW Cost Allocations
Benefit to Existing

- Principles applied to calculating Benefit to Existing (BTE) are consistent with the 2012 DC Study
- Benefit to Existing considers:
  - Upgrades/expansions to the existing systems
  - Providing redundancy/security of supply
  - Capacity required for existing users
  - Addressing a deficiency in the existing system
- Total BTE amounts to $107.2 M (9% of gross cost)

W&WW Cost Allocations
Post Period Benefit

- Principles applied to allocating Post Period Benefit are consistent with the 2012 DC Study
- Post Period Benefit considers:
  - Excess capacity provided by plant expansions towards the end of the 2031 planning horizon that will benefit growth beyond 2031 (e.g. Mid Halton WWTP expansion)
  - Additional cost to install oversized mains that will provide excess flows (e.g. 1200mm WM on Britannia Rd. from 4th Line to RR25)
- Total Post Period Benefit cost amounts to $61.6M (5% of gross cost)

Water Cost Allocation
Res vs. Non-Res Share

	Incremental (Pop/Emp) Growth (Net)	Water Criteria (lpcd)	Max Day Peaking Factor	Growth Related Water Demads (2017-2031) (MLD)	2017 Update %
Capacity					
Region-wide					
Residential	197,610	265	1.9	99.5	75%
Non-Residential	79,271	225	1.9	33.9	25%
Total	276,881			133.4	100%
Distribution					
Greenfield					
Residential	134,192	265	1.9	67.6	74%
Non-Residential	55,720	225	1.9	23.8	26%
Total	189,912			91.4	100%
Built Boundary					
Residential	63,418	265	1.9	31.9	76%
Non-Residential	23,551	225	1.9	10.1	24%
Total	86,969			42.0	100%

Wastewater Cost Allocation
Res vs. Non-Res Share

	Incremental (Pop/Emp) Growth (Net)	Wastwater Criteria (lpcd)	Growth Related Water Demads (2017-2031) (MLD)	2017 Update %
Capacity				
Region-wide				
Residential	197,610	360	71.1	74%
Non-Residential	79,268	310	24.6	26%
Total	276,878		95.7	100%
Distribution				
Greenfield				
Residential	134,192	360	48.3	74%
Non-Residential	55,717	310	17.3	26%
Total	189,909		65.6	100%
Built Boundary				
Residential	63,418	360	22.8	76%
Non-Residential	23,551	310	7.3	24%
Total	86,969		30.1	100%

Transportation Capital Cost ($000's)

Category	Gross Cost 2017 - 2031	Less: Non-Growth (BTE)	Less: Post Planning Period	Net Cost	Res.	Non Res
Road Reconstruction	$ 51,247	$ 51,247	$ -	$ -	$ -	$ -
Road Widening	1,325,581	229,029	73,866	1,022,686	654,520	368,166
Reconstruction with Widening	195,272	49,453	6,153	139,666	89,386	50,280
New Alignment	316,054	11,499	25,701	278,854	178,466	100,388
Structures/Grade Seperation	120,593	6,787	-	113,806	72,838	40,968
ATMP	42,667	6,728	-	35,939	23,001	12,938
Studies/Other	138,552	92,515	-	46,037	29,458	16,579
Total	**$ 2,189,966**	**$ 447,258**	**$ 105,720**	**$ 1,636,988**	**$ 1,047,669**	**$ 589,319**

Transportation Cost Allocations -Benefit to Existing

- Principles applied to calculating Benefit to Existing (BTE) are consistent with the 2012 DC Study
- Benefit to Existing in road widening with reconstruction considers:
  - Residual value in existing roads, as determined under PSAB (Road widening/reconstruction)
  - Existing deficiency measured by exposure index (Railway grade separations)
  - Enhanced service by new intersection signals and studies
- Total BTE amounts to $447.3M (20% of gross cost)

Transportation Cost Allocations – Benefit to Existing ($Millions) – cont'd

Road Widening

ID	6823
Description	Trafalgar Road - Widening from 4 to 6 lanes from Highway 407 to Britannia Rd.
Construction Year	2027

Project Cost ($M)					$	33.12
BTE Calculation:						
	BTE of Resurfacing on Existing Lane					
(1)	Project Length (km)		4.01			
(2)	Mill & Pave Benchmark - $M/lane/km	$	0.28			
(3)	Resurfacing cost (1)x(2)			$ 1.11		
(4)	Net Book Value of Asset	$	7.49			
(5)	Residual Value in Construction Year		3.14			
(6)	BTE % 1-(5)/(4)			58%		
(7)	Existing Pavement Value and Deduction (3)x(6)			$ 0.65		
	BTE of Other Component					
(8)	Intersection & Existing Signal Modifications	$	2.42			
(9)	Intersection & Existing Signal Modifications - BTE %		50%			
(10)	BTE (8)x(9)			$ 1.21		
(11)	Bridge Rehabilitation	$	0.83			
(12)	Bridge Rehabilitation - BTE %		100%			
(13)	BTE (11)x(12)			$ 0.83		
(14)	**Total BTE (7) + (10) + (13)**				$	2.68
(12)	**BTE % Over Total Project Cost**					**8%**

Transportation Cost Allocations -Post Period Benefit

- Allocation method of Post Period remains unchanged from the 2008 DC Study
- Post Period Benefit considers:
  - Capacity that will benefit growth beyond 2031
  - Volume over Capacity ratio to determine the excess capacity created by road improvements in the last five years of planning horizon (2026 - 2031)
- Total Post Period Benefit cost amounts to $105.7M (5% of gross cost)

Transportation Cost Allocations - Res vs. Non-res Share

Category	BPE			Demand	
	2016 (pop,empl)	2031 (pop,empl)	2017-2031 Growth (pop,empl)	Trips	%
Residential	555,707	752,537	196,830	108,060	**64%**
Non-Residential	230,206	309,420	79,214	60,419	**36%**
Total				168,478	**100%**

General Services Capital Cost ($millions)

Services	Gross Cost	Less: Non-Growth (BTE)	Less: Post Period Benefit	Less: Grants, Subsidies &	Less: Statutory Deduction	Net Growth Total	Net Growth Res	Net Growth N-res
Growth Studies	$ 17.6	$ 4.6	$ -	$ -	$ 0.1	$ 12.9	$ 9.1	$ 3.8
Police*	115.8	36.7	25.7	-	-	53.4	37.8	15.6
Paramedics	25.5	8.4	10.1	-	0.7	6.3	5.5	0.7
Facilities	11.8	3.6	1.2	-	0.5	6.5	5.6	0.8
Social Housing	95.0	47.5	-	-	4.8	42.8	42.8	-
Waste Diversion	9.8	4.8	1.7	-	0.3	2.9	2.8	0.1
Waterfront Parks	40.1	9.8	18.2	2.3	1.0	8.9	8.4	0.4
Total	**$ 315.6**	**$ 115.4**	**$ 57.0**	**$ 2.3**	**$ 7.3**	**$ 133.6**	**$ 112.0**	**$ 21.6**

*Capital costs for Police are forecast to 2031