THE CITY OF
Red Deer

Environmental Master Plan 2017 Annual Report: Abridged Reporting on Benchmarks and Metrics
Environmental Master Plan Refresh Underway (2017-2018)

(January to December 2017)

Annual Report Produced: August 2018
Compiled By: Environmental Initiatives, ENVS

Environmental Master Plan 2017 Annual Report: Reporting on Benchmarks and Metrics

Introduction

The City of Red Deer Council adopted the Environmental Master Plan (EMP) in 2011 as a guiding document. The intent of the Plan is not that it mandated but that it provides forward thinking in moving towards improved environmental sustainability. The Plan had the endorsement of many community organizations and stakeholders. The EMP serves as the environmental pillar of Red Deer's Municipal Sustainability Framework and with the other pillars (social, cultural, economic) serves to support Red Deer as a healthy, resilient and progressive community. Red Deer's progress towards improving environmental performance and the achievements in reaching goals set in the EMP are important for the community and the municipal organization to identify and recognize.

Over the last number of years, The City and partners have demonstrated an ongoing commitment to implementing the plan's goals. The City is committed to annually reporting progress towards the various plan targets. To keep the community informed and involved, an Annual Report and report card to the community are issued each year.

Waskasoo Creek, Fall in Red Deer

The plan refresh encompasses a review of the focus areas, metrics, targets, and plan actions (particularly because the majority of the actions contained in the plan have been completed or are in place and ongoing). The EMP review will determine what comes next and how best to continue progress and move forward with sustainability goals.

The Plan's Focus Areas

The EMP identifies seven broad focus areas: Water, Ecology, Transportation, Built Environment, Air, Energy, and Waste. Each focus area establishes a goal and identifies either two, three, or four metrics to measure progress towards this goal. The metrics include targets to measure and drive progress. All total, the Plan contains 20 metrics, each with short term and longer term targets for the life of the plan. This current report presents information for the 2017 calendar year alongside the 2016 results, for comparative purposes from year to year.

Next Level Plans

The current EMP contains recommendations for subject areas that needed more specific or detailed planning work than the Environmental Master Plan could provide in order to support the city's sustainability objectives. As a result, under the wider umbrella of the EMP, several stand-alone plans have been developed and implemented. To date the plans developed out of the EMP include: The Greening the Fleet strategy, the Waste Management Master Plan update, The City of Red Deer 2010 Corporate Greenhouse Gas Inventory, Downtown Red Deer's Investment Attraction Plan (DIAP), a draft Urban Forest Management Plan, and a Community Energy and Emissions Plan (CEEP) looking at community greenhouse gas emissions reduction (in progress). The 2017 Environmental Master Plan Annual Report includes updates on these plans, identifying the ways in which they are taking on their own set of initiatives and implementation targets, all of which link back to the EMP. These annual updates (for completed plans) can be found in the appendices of this report.

Gaetz Avenue, Red Deer

Why Produce a Yearly Report?

The EMP was approved as a planning tool to support environmental action in Red Deer. For this reason, it is important that progress be tracked over time. The Annual Report helps both The City of Red Deer and community members identify accomplishments so that these can be used as a foundation for further advancements. It also recognizes the things that may need to be reconsidered or reset where progress is not moving ahead in the way expected. As has been done yearly since the Plan's adoption, The City will be sharing Annual Report results not just in the form of this detailed document but also as a report card to the community available on The City website.

Results Reporting

To support understanding of the condition of our environment, the EMP Annual Report records and tracks progress on metrics and targets for the plan's 20 metrics. This data is detailed in *Table A: 2017 Report on Metrics and Measures*.

In most cases the following information is noted:

- The 2009 baseline measure (some baselines are for a later year in instances where data was not available or had to be collected and tabulated),
- The 2016 results – as reported in the previous year's Annual Report for comparative purposes
- The 2017 results – being released here as part of this year's Annual Report, and
- Our most immediate targets for that metric which is now the 2020 medium term targets (targets in the Plan were generally set for 2015, 2020, and 2035)

The table indicates whether the results for Red Deer as a City (the Corporation of The City of Red Deer) and/or as a Community are on track to meet the 2020 (10 year medium term) target.

Results Overview

An overview of the 20 areas of measurement indicates:

- ☐ Metrics On Target (11/20):
    - o Water consumption
    - o Annual Water Losses
    - o Natural areas
    - o Man-made green areas
    - o Integrated pest management
    - o Dwelling unit proximity to community amenities
    - o Length of trail kilometres per resident
    - o Community Gardens
    - o Greenhouse Gas emissions
    - o Waste diverted
    - o Amount of residential solid waste

- ☐ Metrics Not On Target (5/20):
    - o Fuel consumption per capita
    - o Modal Split
    - o Building energy: average building intensity
    - o Use of renewable energy
    - o Overall per capita disposal rate

- ☐ Metrics Showing Mixed Results/Results Unavailable (3/20):
    - o Water Quality of Receiving Bodies – water quality is measured by reporting on a group of compounds in the River/tributaries, targets for some compounds have been met and some have not been met
    - o Development "Footprint" of per capita land consumption – no data was collected for 2017.

- o Air quality - air quality is measured by reporting on a group of compounds in the air, targets for all compounds have been met with the exception of fine particulate matter air quality (PM $_{2.5}$)

- ☐ Metrics With No Established Targets (1/20):
  - o Urban forestry - no established targets or metrics. The necessary study is completed in draft only therefore, at the time of EMP reporting; no targets or baselines had been established.

As in previous years, The City will also publish a public report card highlighting the key 2017 EMP results.

Table A: 2017 Report on Metrics and Measures

Benchmarks and Metrics Results 2017

EMP Metrics by Focus Area	2009 Baseline	2016 Results	2017 Results	2020 Target	Progress to the 10 Year Target?
Population	*89,891*	*99,832*	*99,832* *no city Census conducted in 2017*		
WATER					
Potable water consumption provided through municipal water supply, per capita (L/cap/day)	Residential: 242 L/cap/day Industrial/ Commercial /Institutional (ICI): 135 L/cap/day	Residential: 192 L/cap/day ICI: 108 L/cap/day * Data from Environmental Services. **Note that water consumption can be dependent on weather conditions.	Residential: 191 L/cap/day ICI: 108 L/cap/day * Data from Environmental Services. **Note that water consumption can be dependent on weather conditions.	Decrease by 22% (to Residential: 189 L/cap/day and ICI: 105 L/cap/day)	Yes on track towards 2020 target.
Water Quality of Receiving Bodies * Based on the Red Deer River Watershed Alliance's Integrated Water Management Plan water quality objectives.	Total phosphorus: 0.017 mg/L Total nitrogen: 0.381 mg/L Total suspended solids: 4 mg/L Dissolved oxygen: 10.4 mg/L E.Coli: 9 counts/100mL	Total phosphorus: 0.0135 mg/L Total nitrogen: 0.410 mg/L Total suspended solids: 3.4 mg/L Dissolved oxygen: 11.2 mg/L E.Coli: 11 counts/100mL	Total phosphorus: 0.0125 mg/L Total nitrogen: 0.410 mg/L Total suspended solids: 2.9 mg/L Dissolved oxygen: 11.2 mg/L E.Coli: 11 counts/100mL	Do not exceed: Total phosphorus: 0.017 mg/L Total nitrogen: 0.381 mg/L Total suspended solids: 4 mg/L Dissolved oxygen: 10.4 mg/L	Yes and No. Exceeded in nitrogen, dissolved oxygen, and E. Coli. The City continues to learn about and implement best practises and Low Impact Development (LID) techniques to reduce our impact on water quality in order to meet the

EMP Metrics by Focus Area	2009 Baseline	2016 Results	2017 Results	2020 Target	Progress to the 10 Year Target?
Population	*89,891*	*99,832*	*99,832* *no city Census conducted in 2017*		
	* Baseline and targets approved for 2016 forward.			E.Coli: 9 counts/100mL	2020 target.
Annual water losses recorded	2015 = 11% ** Note: reporting refinements in 2016 incorrectly double counted reservoir capacity and pipe capacity. The benchmark of 11% from the original CEP has been confirmed to be correct.*	11%	7%	10% maximum of total water use attributed to losses by 2020	Yes on track towards/are achieving the 2020 target.
ECOLOGY					
Natural Areas: Land within the city's developed area devoted to native natural features (native tree stands, wetlands, seasonal streams, grasslands, and associated biodiversity)	Total Natural Area = 863 ha	Total Natural Area = 914 ha	Total Natural Area = 923 ha	Increase by 10% (to 949 ha)	Yes on track towards 2020 target.
Man Made Green Areas: land devoted to man-made natural features (city parks, turf areas shrub beds and naturalization areas).	Total Man-Made Green Area = 809 ha	Total Man-Made Green Area = 870 ha	Total Man-Made Green Area = 867 ha	Increase by 10% (to 890 ha)	Yes on track towards 2020 target.
Integrated Pest Management:	210 ml/acre	533,610 ml herbicide + 0 ml insecticide =	237,573 ml herbicide + 0 ml insecticide =	Decrease by 5% (to 199.5 ml/acre)	Yes on track towards/are

EMP Metrics by Focus Area	2009 Baseline	2016 Results	2017 Results	2020 Target	Progress to the 10 Year Target?
Population	*89,891*	*99,832*	*99,832* no city Census conducted in 2017		
Volume of toxic pest control product used per acre of municipally owned land (ml/acre)		533,610 ml 533,610 ml / 4408 acres = 121 ml/acre	237,573 ml 237,573 ml / 4423 acres = 54 ml/acre		achieving the 2020 target.
Urban Forestry: Urban forest coverage (percentage of area within city's developed area covered by tree canopy)	TBD by 2014, now extended to 2018	Plan in progress.	Update 2017: Plan is drafted, pending Council consideration.	No target set. Plan completion anticipated 2017-2018.	No target set as of yet.
TRANSPORTATION					
Total Fuel (gasoline and diesel) consumption data for the city annually (Note this metric replaces Vehicle Kilometres Travelled (VKT) per capita/day by car used in 2011)	1257 litres/capita (L/cap) Total gasoline and diesel consumption = 112,998,927 L	1424 L/cap Total gasoline and diesel consumption = 142,187,220 L	1418 L/cap Total gasoline and diesel consumption = 141,570,111 L	Target (2015) =1156 L/cap Target equates to an overall 8% reduction by 2015 from the baseline year (2009). No target set for 2020 or 2035.	No, fuel consumption has increased. Red Deer did not meet the 2015 target and no other targets have been established as yet.
Modal Split: Percentage of different modes	Car: 88% Transit: 4% Pedestrian or Bike:	Car: 89% Transit: 4% Pedestrian or Bike:	Car: 89% Transit: 4.5% Pedestrian or Bike: 5%	2016: Car: 86% Transit: 5%	No, modal split did not meet the 2016 target and no other

EMP Metrics by Focus Area	2009 Baseline	2016 Results	2017 Results	2020 Target	Progress to the 10 Year Target?
Population	*89,891*	*99,832*	*99,832* *no city Census conducted in 2017*		
of transportation used to travel to work	7% Other: 1%	5% Other: 2% (Source: 2011 Census, released 2012) * Note: 2016 Census results were not yet available at time of annual reporting.	Other: 1.5% (Source: 2016 Census, released 2017)	Pedestrian or Bike: 8% Other: 1%	targets have been established as yet.
Dwelling Units within 400 metres of: 1) public trails, parks or other green space, 2) at least 5 basic amenities represented by commercial zoned properties or school sites*, and 3) Transit stops* *Council approved in 2012 Annual Report	2012 served as our baseline**. 1) Public trails, parks or green space = 100% 2) Commercial zoned property = 56% and existing schools = 38% 3) Transit stops = 97% **Baseline calculation does not include residential units not in an urban neighbourhood (e.g. Central Park is not included) ***Measurement is completed as the crow flies.	1) Public trails, parks or green spaces = 100% 2) Commercial zoned property = 59%; and existing schools = 37% 3) Transit stops = 99% 4) Dwelling units within 400 meters of all parameters = 23%	1) Public trails, parks or green spaces = 100% 2) Commercial zoned property = 60%; and existing schools = 40% 3) Transit stops = 99% 4) Dwelling units within 400 meters of all parameters = 26%	1) Public trails, parks and other green space = 100% 2) Commercial zoned property = 60%, and existing schools = 45% 3) Transit stops = 97% *Target for 2015 no further targets have been set	Yes. Target for proximity to community amenities is achieved (proximity to schools is slightly below target but all others have been met or exceeded). These were 2015 targets and no other targets have been established as yet.

EMP Metrics by Focus Area	2009 Baseline	2016 Results	2017 Results	2020 Target	Progress to the 10 Year Target?
Population	*89,891*	*99,832*	*99,832* no city Census conducted in 2017*		
refinement of this metric to amenities represented by commercial and school sites and all transit stops.					
Length of trails/ bicycle/ pedestrian routes (km/capita) Measured in lane kms. Includes bike routes (shared) and bike lanes (dedicated), multi-use trails (including asphalt and concrete surface trails in parks and shared trails (includes non-hard surface trails such as boardwalk, aggregate, wood chip, & pedestrian only trails). ** note wording and definitions refined in 2012 to ensure clarity and inclusion of trails that reflect the transportation goals of the EMP	1 km ratio to every 672 persons (2009 Census: 89,891 persons)	Bike Lanes Shared 7.3 km Dedicated 12.2 km **TOTAL 19.5 km** Park Multi-Use Trails Concrete 18.8 km Asphalt 106.8 km **TOTAL 125.6 km** Shared Trails Boardwalk 0.87 km Aggreg. 36.6 km Dirt 7.9 km Brick 0.5 km **TOTAL 45.6 km** Cumulative total 190.7 km With a population of 99,832 the ratio of bike/pedestrian routes to residents is **1 km: 524 residents**	Bike Lanes Shared 7.3 km Dedicated 12.1 km **TOTAL 19.4 km** Park Multi-Use Trails Concrete 13.0 km Asphalt 119.2 km **TOTAL 132.2 km** Shared Trails` Boardwalk 0.93 km Aggreg. 36.9 km Dirt 8.9 km Brick 0.53 km **TOTAL 47.3 km** Cumulative total 198.9 km With a population of 99,832 the ratio of bike/pedestrian routes to residents is **1 km: 502 residents**	Increase by 10% (to 1 km ratio to every 605 persons)	Yes, on track towards/are achieving the 2020 target.

EMP Metrics by Focus Area	2009 Baseline	2016 Results	2017 Results	2020 Target	Progress to the 10 Year Target?
Population	*89,891*	*99,832*	*99,832* no city Census conducted in 2017*		
BUILT ENVIRONMENT					
Our Development Footprint "Per Capita Land Consumption" in metres squared per person *Definition: "Per Capita Land Consumption" is the total amount of land within the city that has an urban type zoning (and is or will be imminently used for urban uses) plus roads divided by the current Red Deer population. Note: This metric replaced Development Density in Council's approval of 2012 Annual Report.*	Baseline (2011) 740.8 m²/person Figure by land use category: -Commercial: 40.7 m²/person -Industrial: 96.2 m²/person -Institutional: 91.0 m²/person -Parks / Open Space: 151.5 m²/person - Residential: 200.2 m²/person - Roads: 161.2 m²/person **TOTAL**: 740.8 m²/person	699.5 m²/person Figure by land use category: -Commercial: 31 m²/person Direct Control: 13.9 m²/person Industrial: 96.5 Parks /Open Space/Institutional: 204.2 m²/person Residential:189.7 Roads: 164.2 m²/person **TOTAL**: 699.5 m²/person	The Planning Department is unable to report on this figure for 2017.	674 m²/person 1% decrease per year from baseline data 2020 – 9% drop from 2011 figure	Unknown.
Community Gardens: The land devoted to community gardens and urban agriculture in area	0.4 m²/cap Note: This combined the total garden plot area as per the City Garden Plot Program with the raised bed garden space as per the Community Garden model (smaller, raised	Total City managed plots: Large: 43 (5,160 m²) + Medium: 250 (15,000 m²) + Small: 51 (1,530 m²) = 21,690 m²	Total City managed plots: Large: 43 (5,160 m²) + Medium: 250 (15,000 m²) + Small: 52 (1,560 m²) = 21,720 m² Total Community	Increase to : 0.75 m²/capita by 2020	Yes, gradually progressing. More community garden plots have been opened in recent years.

EMP Metrics by Focus Area	2009 Baseline	2016 Results	2017 Results	2020 Target	Progress to the 10 Year Target?
Population	*89,891*	*99,832*	*99,832* no city Census conducted in 2017*		
(m²/capita)	bed gardens that are funded by City and managed by community).	Total Community Orchard/Food Forest: Parkside Food Forest 500 m² +Mountview /Sunnybrook Orchard 100 m^2 + Central Food Forest 150 m² + Lancaster Green Orchard 60 m^2 + Waskasoo Orchard 30 m^2 = 840 m^2 Total community partnership gardens: 109 boxes/raised beds (622 m^2) TOTAL GARDEN AREA=21,690 + 840 + 622 = 23,152 m^2 / 99,832 or **0.23 m^2 / capita**	Orchard/Food Forest: Parkside Food Forest 500 m² + Mountview /Sunnybrook Orchard 100 m^2 + Ft. Normandeau Orchard 120 m² + Sunnybrook Farm Orchard 140 m^2 + Central Food Forest 150 m² + Lancaster Green Orchard 60 m^2 + Waskasoo Orchard 30 m^2 = 1100 m^2 Total community partnership gardens: 121boxes/raised beds (653 m^2) TOTAL GARDEN AREA=21,720 + 1100 + 653 = 23,473 m^2 / 99,832 or **0.24 m^2 / capita**		

EMP Metrics by Focus Area	2009 Baseline	2016 Results	2017 Results	2020 Target	Progress to the 10 Year Target?
Population	*89,891*	*99,832*	*99,832* no city Census conducted in 2017*		
AIR					
Greenhouse Gas emissions per capita in tonnes (CO_2 equivalent)	Baseline 2010*: Corporate**= 151,347 tCO2e or 1.68 tonnes/ person * Baseline and targets set within the Corporate GHG Plan and The Community Energy and Emissions Plan (CEEP) ** Recalculations in baseline figures due to increase in methane emissions factor shifting from 21 to 25 under Government of Canada protocol/convention	Corporate*** (2017 protocol)= 141,931 tCO2e or 1.42 tonnes/person *** Recalculations in 2016 figures due to increase in methane emissions factor shifting from 21 to 25 under Government of Canada protocol/convention	Corporate = 140,067 tCO2e or 1.40 tonnes/person	Corporate Target[+] = 30% by 2020 and 50% by 2035 (2020: 105,943 tCO2e 2035: 75,674 tCO2e) +Recalculation in target due to increase in methane emissions factor shifting from 21 to 25 under Government of Canada protocol/convention	Yes. Emissions are decreasing.
	Community= 1,674,171 tCO2e or 18.58 tonnes/person	Community= 1,614,797 tCO2e or 16.18 tonnes/person	Community= 1,661,623 tCO2e or 16.64 tonnes/person	Community: *TBD within the Environmental Master Plan Refresh (2018)*	No target set.
Air Quality: maintain and lower ambient concentrations of airborne pollutants, not exceeding	PM2.5: 15.9µg/m³ (2007-2009) Canada Wide Standard for: Ozone: 57.5 ppb (2007-09)	PM2.5: 26 µg/m³ (2013-2015) Ozone: 53 ppb (2013-2015)	PM2.5: 26 µg/m³ *(2013-2015) * *Updated results not available* Ozone: 53 ppb* (2013-2015)	Canada Wide Standard metric By 2015: PM2.5: 20µg/m³ Ozone: 58 ppb	Yes and No. Air quality meets all targets with the exception of Fine Particulate Matter (PM 2.5). These

EMP Metrics by Focus Area	2009 Baseline	2016 Results	2017 Results	2020 Target	Progress to the 10 Year Target?
Population	*89,891*	*99,832*	*99,832* no city Census conducted in 2017*		
maximums defined by the Canada Wide Standard and AB Environment	Sulphur Dioxide SO_2: 0.44 ppb (2005-2009) Nitrogen Dioxide NO_2 : 12.1ppb (2005-2009) Carbon Monoxide CO: 0.25ppm (2005-2009)	SO_2: 0.23 ppb (2012-2016) NO_2: 9.9 ppb (2012-2016) CO: 0.17 ppm (2012-2016) **Note: some adjustments to reporting as official results released/updated by Government of Alberta in Spring 2018.*	** Updated results not available* SO_2: 0.22 ppb** (2013-2017) NO_2: 9.5 ppb** (2013-2017) CO: 0.19 ppm^ (2013-2017) *** Average measured at both Red Deer monitoring stations* *^ Measured at Riverside monitoring station only*	SO_2: 0.42 ppb NO_2: 11.5 ppb CO: 0.24 ppm	were 2015 targets and no other targets have been established as yet. PM 2.5 and Ozone data results are from 2013-2015 as The Government of Alberta has not released updated data for 2015-17. PM 2.5 levels reported in the past placed Red Deer at a level where the Canadian ambient air quality standards (CAAQS), were exceeded. These standards were passed federally in 2013 to replace the Canada Wide Standard.
ENERGY					
Building Energy: Average Building Intensity	Baseline (2012)^ 42.5 ekWh/sq. ft.	42.3 ekWh/sq. ft	42.3 ekWh/sq. ft.	**By 2020, 20% reduction from 2012 levels.*	Not really, as this metric has decreased only

EMP Metrics by Focus Area	2009 Baseline	2016 Results	2017 Results	2020 Target	Progress to the 10 Year Target?
Population	*89,891*	*99,832*	*99,832* no city Census conducted in 2017*		
(equivalent KWh/sq. ft. and sq. m)	457 ekWh/sq.m. ^ *Note: baseline measure revised this year to address math errors or other corrections (e.g. consistency of square meters and square feet)*	455 ekWh/sq.m	455 ekWh/sq. m. ^ *Note: 2015 data amended to address changes or corrections (e.g. some rental office space no longer in City inventory such as Alexander Way building)*	(to 34 ekWh/sq. ft. and 365.6 ekWh/sq. m.) By 2035, 50% reduction from 2012 levels. (to 21.3 ekWh/sq. ft. and 228.5 ekWh/sq. m.) **Based on targets set in EMP Appendix E Benchmarking Tool*	slightly from the baseline measure.
Renewable energy sources: percentage of energy utilized by The City of Red Deer that is produced through green sources (such as renewable resources and energy captured from waste).	15%	30%* **EcoLogo certified green energy purchased for 2016 was 30% (14,500 MWh) but this is discontinued for 2017*	0%* **Civic Yards panels generate energy, but the meters only track the surplus sold / returned to the grid, which in 2017 was 0.01% of energy used. Total production by the wash building and building #300 is unknown. EcoLogo certified green energy purchase was discontinued for 2017.*	40%	No, use of renewable energy decreased dramatically in 2017.
WASTE					
Amount of Residential Solid Waste*: *Measured as residential garbage*	641 kg *Annual kg of garbage per residential curbside account*	552 kg	499 kg	2019 target is 450 kg 2023 target is 400 kg	Yes, on track towards/are achieving the 2019 target.

EMP Metrics by Focus Area	2009 Baseline	2016 Results	2017 Results	2020 Target	Progress to the 10 Year Target?
Population	*89,891*	*99,832*	*99,832* no city Census conducted in 2017		
in kilograms collected curbside in the city per household per year					
Overall per capita disposal rate: *(meaning total amount of solid waste disposed measured per year per capita and excluding waste from regional customers)*	812 kg/capita (2011)	799 kg/capita	830 kg/capita	2020 target is 600 kg/capita 2023 target is 500 kg/capita.	
Waste Diverted: percentage of waste diverted per year per tonne of waste land-filled.	10%	16%	14%	Increase to 30%	Yes, on track towards achieving the 2020 target

Results Summary

The 2017 Annual Report indicates measured achievement across all seven focus areas. The EMP is undergoing a review and refresh in 2018-19, giving close consideration to these results as well as actions and initiatives that will support Red Deer in meeting targets and goals.

Recommendations

As the review of the Environmental Master Plan is underway, no recommendations for edits or changes to the Plan are suggested at this time.

Appendix A: Year End Status Reports of Plans Adopted under the direction of the Environmental Master Plan

- Greening the Fleet: 2017 Annual Reporting
- Waste Management Master Plan: 2017 Annual Reporting
- Built Environment Focus Area: 2017 Annual Reporting
- Corporate Greenhouse Gas Emissions Analysis and Reporting 2017
- Urban Forest Management Plan: 2017 Annual Reporting

Greening the Fleet

INTRODUCTION

The Environmental Master Plan (EMP) identified opportunities to reduce Green House Gas (GHG) emissions in our community by Greening the Fleet. Greening the Fleet means to: reduce the environmental impact of our fleet, be fiscally responsible and be mindful of social benefits. The current status of the primary initiatives taken to Green the Fleet is as follows:

I)   ALTERNATIVE FUEL VEHICLE IMPLEMENTATION (CNG)

<u>Background:</u>   In 2014, Council approved the Compressed Natural Gas (CNG) Transit Bus Proposal. It was determined that the use of CNG fuel in full size Transit buses will significantly reduce GHG emissions since Transit consumes two-thirds of all fuel used by the City subfleets.   Implementing a CNG fueling infrastructure will make it viable to expand CNG into other subfleets, increasing synergies and further reducing GHG emissions.

<u>Potential Benefits:</u> Migrating to a CNG Infrastructure for Transit Buses, Paratransit Buses, Pickup Trucks (1 ton, ¾ ton, ½ ton), HD Dump and Utility Bed Trucks has the potential to reduce petroleum consumption and environmental impact by decreasing fuel consumption and increasing fuel savings.

<u>Current Status:</u> The CNG project is operational, with 13 new CNG transit and paratransit buses delivered in 2016/17. Construction of the CNG fueling station and associated building modification is complete and the ribbon cutting ceremony for the new CNG buses occurred in July 2017.

Procurement for an additional 10 CNG Transit buses complete with delivery in 2018, for a total of 23 CNG buses in the fleet.

II)   IDLE FREE INITIATIVE

Background: In 2008, the City of Red Deer launched a fleet wide idle free initiative. To support this initiative, The City deployed signs, placed decals on vehicle doors, created an information card, and acknowledged employees with exemplary idling behaviors.

In 2015, the corporate Idle Free program was re-launched as the "Idling Gets You Nowhere" Program. Fuel saving information was interactively shared with staff at the Civic Yards through several 'green' cork boards that showcased monthly idle free and fuel saving practices. Coffee cards were rewarded to successful draw applicants that answered fuel saving questions correctly.

Potential Benefits: For a relatively low implementation cost this initiative has the potential to increase corporate fuel efficiency thereby reducing the emissions footprint and increasing significant operational cost savings fleet wide.

Current Status: The Fleet Garage, as part of regular maintenance, has the ability to identify idle times for certain fleet vehicles and are communicating this data back to the sub-fleets (specifically Transit).

The cultural shift away from excessive idling is still encouraged but requires persistent advocacy from operational supervisors and management. Fleet Services will continue to advance the "Idling Gets You Nowhere" and acknowledge individuals who lead this change.

In 2017 the electric car rotated throughout City departments, with positive response for local driving.

Next Possible Actions:
- Expand GPS system to more units to collect fuel use and driver behavior
- Build on technology to collect and analyse data on idling behaviour
- Ignite – "Idling 'Gets You Nowhere" Program
- Implement metrics to track progress
- Define achievable goals
- Encourage good behavior and enforce policy

III)   SMART DRIVER INITIATIVE

Background: Implementing a Smart Driver Training program was identified as "low hanging fruit" that could significantly reduce operational costs and GHG emissions fleet wide.

Potential Benefits: Implementing Smart Driver Training fleet wide has the potential to improve fuel efficiency thereby decreasing fuel consumption and high maintenance costs.

Current Status: The Smart Driver Training is currently implemented for all new drivers and drivers needing to refresh their driving training certification, fleet wide. Some of the Smart Driver training includes: driving within the speed limit, coasting around corners, not over-using the brakes, not being on-and-off the accelerator, non-aggressive driving, low rpms for fuel efficiency and more.

Though training is being provided, it is difficult to determine if the Smart Driver behaviour is being practiced.

Next Possible Actions:
- Install driver information systems to show real-time efficiency and effects of driving behavior
- Develop driver incentives
- Publish Smart Driver Tips in the Civic Spirit
- Display Smart Driver Tips on the Green Cork Boards at the Civic Yards
- Ensure new contractor continues to incorporate Smart Driver training

IV)   VEHICLE RIGHT- TYPING

Background: Initially started in 2009 to reduce overall capital expenditures and operating costs, the City is currently taking steps to Right-type equipment with the input of subfleet representatives to ensure optimized vehicles are being purchased and utilized.

Potential Benefits: Right-typing has potential for a sizable operational cost and emission footprint reduction by purchasing smaller fuel efficient replacement vehicles fleet wide.

Current Status: Public Works Fleet Service continues to guide subfleets into selecting vehicle types that are best suited for their daily operations. In 2017, Public Works commenced a corporate Fleet Policy, to help right typing reach its full potential.

Next Possible Actions:
- Finalize and launch a Vehicle Right-Typing section within the Fleet Policy

V)   VEHICLE RIGHT- SIZING THE FLEET

Background: It was identified that Right Sizing the fleet has potential to increase the unit utilization by partnering and pooling resources with the subfleets.

Potential Benefits: Right-Sizing the Fleet has potential for generating savings by reducing operational costs (vehicle leases, new acquisitions, preventative maintenance) in accordance with the size of the fleet.

Current Status: There was a fleet pool started in 2017 for pick-up trucks. Fleet kept seven fully depreciated vehicles within the fleet to rent as needed at a reduced rate. The response has been excellent, and all are rented out long-term. With this success, it is hoped to expand this pooling concept. Like the Idle Free initiative, support and leadership from frontline supervisors, superintendents and managers will be needed to create a cultural change in the way we maximize the use of our resources.

Next Possible Actions:
- Finalize and launch Vehicle Right-Size section within the Fleet Policy

CONCLUSION

Numerous Greening the Fleet initiatives are advancing in various stages to meet the directive of reducing our GHG emissions on our community as identified by the EMP. The next possible actions have been identified to help drive these initiatives forward.

Waste Management Master Plan: 2017

The Waste Management Master Plan (WMMP) was approved by Council on May 13, 2013, making 2017 the fourth full year of implementation.

2017 Activities
Education / Promotional Approaches:
- Government leadership
  - After a successful pilot project with the Public Works Department, and subsequent expansion to the departments located at the Civic Yards, the Corporate Waste Diversion program was further expanded to Fire Stations 3 & 4, City Hall and the Wastewater Treatment Plant.
- Zero Waste Public Events
  - Began drafting a "zero waste events" guide to summarize best practices to minimize waste at events.
  - Developed zero waste stations that can be used at events and reinforce the same colours for containers for collecting materials as is used in the Cart Pilot Project. The stations were piloted at a handful of internal events, and adjustments to processes and signage were made based on lessons learned.

Residential Waste Reduction / Diversion:
- Continued the award winning Composting at Home program, providing the opportunity for another 200 Red Deer households to learn how to back yard compost.

Industrial, Commercial and Institutional (ICI) Waste Reduction:
- The corporate waste diversion program was developed and expanded with the intent to use the program as a pilot/model to help assist the ICI sector.

Cart Pilot Project:
- Following the evaluation of the cart pilot project's results, namely that pilot households reduced the amount of garbage they produce by 39% compared to non-pilot households, Council approved implementing a city-wide Green Cart program in April 2018, to be followed by a city-wide Blue and Black Cart program in the spring of 2019.

- Extensive preparations were conducted in 2017 in advance of 2018's Green Cart launch, including procuring carts, collection services and composting capacity, drafting Utility Bylaw updates and developing a robust education and marketing campaign to support the new Green Cart program.

What's next in 2018:
- Green Cart collection will begin for households the week of April 9, 2018.
- Further detailed planning to support the launch of Blue and Black Carts in the spring of 2019.
- Further expansion of the Corporate Waste Diversion program to the Water Treatment Plant and the remainder of the Fire Halls.

Built Environment Focus Area

September, 2018

Introduction

The Environmental Master Plan (EMP) identifies a Built Environment goal of creating "vital, well integrated, compact communities that minimize negative environmental impacts"[1]. Activities which support compact urban form and minimum densities, environmental design standards, integrated parking, and underutilized site redevelopment are germane to this focus area.

1) ***Downtown Red Deer's Investment Attraction Plan* (DIAP) – *Stimulating Development on Underutilized Sites* (Section 3)**

Background

The EMP recommends encouraging the redevelopment of brownfield sites (in accordance with Greater Downtown Action Plan). To help further this work, the *Downtown Red Deer's Investment Attraction Plan* was undertaken in 2016.

The DIAP was approved by Council as a corporate planning tool on May 26, 2016. The plan is comprised of three key areas of focus: 1) Business Retention and Investment Attraction, 2) Parking Management, and 3) Stimulating Development on Underutilized Sites. Underutilized sites, for the purposes of the DIAP, includes both greyfield and brownfield sites. The plan provides a detailed overview of the legislative and policy landscape both locally and provincially surrounding underutilized sites development, as well as an assessment of promising practices, and recommended strategies for The City to explore in efforts to stimulate development on underutilized sites.

Benefits

Brownfield site redevelopment is recognized as an effective strategy in the mitigation or elimination of health/safety risks related to contaminated sites, restoration of environmental quality, reducing urban sprawl, reducing GHG emissions, supporting more compact urban form, and promoting ecological health.

---

[1] EMP, pg. 38

Potential initiatives stemming from DIAP recommendations could have positive impacts contributing to *Environmental Master Plan* goals of reduced environmental contamination in our city, reduced pressure for greenfield development, and improved air quality resulting from more compact urban redevelopment and the resulting reduction in transportation needs.

Current Status
Forthcoming *Municipal Government Act* changes will have an impact on how municipalities manage brownfield redevelopment moving forward. In order to establish the necessary policy base to support future efforts around brownfield redevelopment, City Administration is preparing to bring forward a *Brownfield Sites Bylaw*, intended to establish parameters for The City regarding brownfield redevelopment and incentive programs. The development of the *Brownfield Sites Bylaw* is contingent on forthcoming MGA changes, and next steps will be determined subsequent to these being adopted.

2) Downtown Residential Attraction Study Project

Background
The EMP recommends that The City "explore tax and other incentives to facilitate downtown reinvestment complimentary to the Greater Downtown Action Plan"[2]. To further previous guiding work the municipality has done, such as the *Economic Development Strategy*, *Downtown Red Deer's Investment Attraction Plan*, and *Greater Downtown Action Plan*, The City applied for provincial funding for a "Downtown Residential Attraction Study".

Benefits
The aim of the study is to increase the number of residents living in our downtown, which will have a direct impact on improving the downtown local business environment and increasing downtown investment.

Current Status
Administration anticipates this report to be completed in Q4, 2018.

---

[2] EMP pg 39

3) *Downtown Red Deer's Investment Attraction Pla*n (DIAP) – *Parking Study* (Section 2) & *Parking Management Strategy* (2017)

Background

The *Environmental Master Plan* recommends that The City "include consideration of parking practices and policies that encourage public transit use and alternative forms of transportation"[3]. *Municipal Development Plan* policy 16.2 directs The City to "prepare and maintain transportation plans for Red Deer incorporating polices, standards and proposals related to the movement of private and commercial vehicles, transit (including special needs), **parking**, bicycling and walking"[4].

As noted, the DIAP (2016) includes a *Parking Study* component along with recommended short, medium and long-term actions to help improve municipal parking management activities. To guide the prioritization and implementation of these parking actions, Administration worked with Council in 2016 to develop parking management principles intended to ensure integrated parking management policies and procedures, and support balanced implementation moving forward.

Developed to guide implementation of the stated parking principles and objectives, the *Parking Management Strategy* (2017) strives to achieve efficient and effective public parking management while supporting business vitality and sustainable transportation policies. In support of *Municipal Development Plan* and *Environmental Master Plan* direction, principle # 3 within the strategy compels administration to "promote, establish and maintain programs and facilities that encourage the use of alternative modes of transportation including public transit, car/van pooling, taxis, auto-sharing, cycling and walking".

Benefits

Integrating parking management activities aligned with multimodal transportation, economic development, and financial leadership objectives will help ensure that public parking management supports broad corporate and community objectives in a comprehensive manner.

Current Status

The 2017 *Parking Management Strategy* is being actively utilized to guide the development of Corporate Administrative policies regarding integrated parking management moving forward.

---

[3] EMP, pg 38
[4] MDP, pg 46

4) Capstone at Riverlands

Background

The future vision for Capstone at Riverlands has been well established, and continues to be refined. In 2015, The City initiated a conceptual design process of Riverlands, to build on the valuable work that has been done and begin to create some imaginative and inviting designs, focusing on Alexander Way and the Riverwalk. The conceptual design was prepared with a people-first design approach, evolving the plan around public space and public life. Using the conceptual design as a basis, and through additional public engagement, the Area Redevelopment Plan (ARP) and the Land Use Bylaw (LUB) were both updated in 2016 and approved by Red Deer City Council in December of 2016. Since then, work continues to finalize the design and start construction on upgrades to key infrastructure, before above ground redevelopment starts.

Benefits

The redevelopment of the Capstone at Riverlands neighbourhood hits the mark on a number of concepts that support some of the priority policies identified within the EMP, and also some of the recommendations from the DIAP. At a fundamental level, this redevelopment project will encourage new development within existing underutilized lands.The redevelopment of Riverlands will have a positive influence on a number of the focus areas from the EMP. For example, consider Ecology; the Riverlands plan includes preservation of existing natural areas, development of additional green spaces and naturalized parks. The increased density requirements and the very nature of redevelopment will help improve our metrics relating to the Built Environment; the per capita land requirements will be much less than the targets set in the EMP and the plan includes space for high quality community gardens. Riverlands will also be leading the way for urban development in Red Deer from a mobility perspective and also with regards to energy efficient buildings.

The DIAP recommends Marketing as one of the focus areas, and this is also one of the key focus areas for Capstone – to attract top quality developers and businesses, and to bring new residents into the downtown. The investment that The City is making in Capstone with new infrastructure, including new parks, walkable streets, and public plazas will also help with retention and intensification of the existing businesses in the area. The DIAP also recommends focusing on underutilized lands, and Riverlands is currently one of the City's largest holdings of underutilized lands with 25 acres of vacant land currently owned by The City, and a number of other vacant sites within the neighbourhood. The investment that The City is currently making in Riverlands will help attract and incentivize private investment and development in the area.

Current Status

The planning and visioning stage for Capstone is complete, and we are now well into the implementation phase. Major capital upgrades completed in 2018 include, the replacement of a major storm water trunk main and outfall, replacement of aging underground water and sewer lines, replacement of underground electrical and communications lines and the start of new roads, sidewalks, trails and parks.

Next Steps

Capital construction in 2018 has focused on Alexander Way and 45 Street. In 2019, the focus will shift to the Canada 150 Square, the Riverwalk and hopefully the start of private development in the City's vacant lands.

5) Timberlands

Background

Red Deer's Timberlands neighbourhood addresses a number of focus areas with the *Environmental Master Plan.* The *EMP* states that the goal for the **Built Environment** is "to create vital, well-integrated, compact communities that minimize negative environmental impacts". Additionally, the **Ecology** section focuses on devoting more natural elements and materials with man-made community features, and the **Transportation** section states its goal as prioritizing active and public transportation.

Benefits

Implementing environmentally sustainable initiatives into our communities allow for lower City maintenance costs, more efficient land use, improved walkability and ultimately more housing options for Red Deerians. Timberlands North also exemplifies to Red Deer's private developers how to incorporate these principles into their communities.

Current Status

Timberlands North implements a number of environmentally sustainable initiatives that address the Built Environment, Ecology and Transportation sections of the EMP. Low Impact Development (LID) principles have been incorporated in a number of ways throughout the Timberlands community. LID design, such as the planting of native vegetation allows for improved drainage, more absorption, and increased stormwater infiltration, reducing impacts on natural wetlands and watercourses. As well, designing green spaces to mimic natural landscape elements (such as hardy trees and grasses) allow existing natural environments to flourish and reduce the amount of maintenance required. A greater dedication to trees means as the

community matures, the increased tree canopy will reduce potential risk of 'heat island effect'. Site furniture such as benches and gazebos in public spaces are made of durable materials to withstand aging, needing to be replaced less frequently. Timberlands has unique pedestrian-friendly LED lighting whose height is lower than the average community light pole, reducing the amount of light pollution spilled up and out of the community. And the commercial district was developed to include photo voltaic, meaning solar energy powers the stores.

The Timberlands community was designed to be a more walkable community, with bus stops peppered throughout the community, lower street lamps to provide more pedestrian-friendly lighting, as well as illuminated bollards and signage to identify pedestrian corridors, parks and trails. Traffic calming curb bump-outs and textured paving patterns where sidewalks meet crosswalks also help identify crosswalks. Sidewalks in residential areas are separated from the road by tree-lined boulevards, increasing the feeling of safety for the pedestrian, as well as providing a visually-appealing streetscape.

Lastly, Timberlands North achieves higher density and efficiency of land use through creative community design, grid pattern street layout and a mix of housing products. The design of the Wide Shallow lots included shared back-fences, and saw the elimination of rear lanes, while carriage house (R1C) lots provide the opportunity for two units on one property, as a second home can be built above the rear detached garage. Additionally, living spaces have been incorporated into the commercial district with Live-Work product and Mixed Use commercial on the ground floor and living space above.

Corporate Greenhouse Gas Inventory & Plan

Update 2017

Background
- Created in 2012 and adopted by Council as a planning guide on April 2, 2013
- Stems from the EMP Air focus area: the inventory is one of the metrics and the reduction plan is a top priority action
- Recommends 30% reduction from 2010 levels by 2020 and 50% by 2035

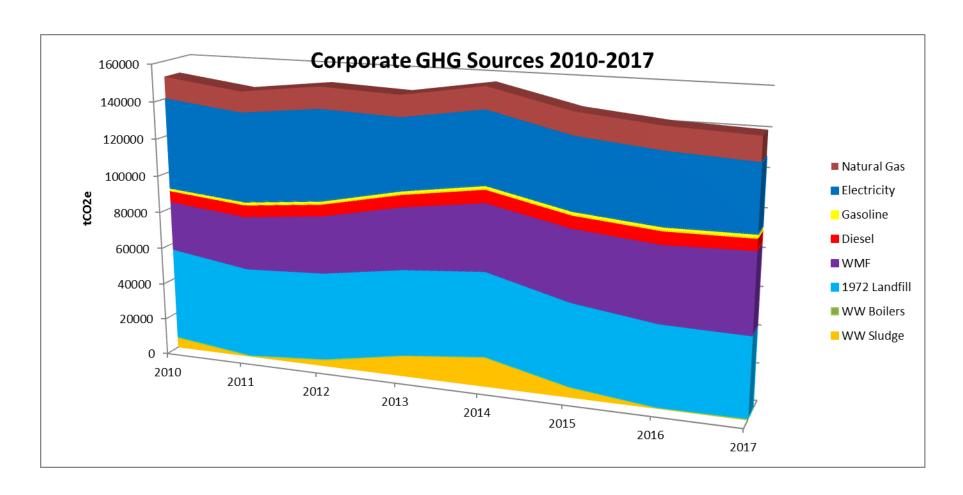**Year over year corporate GHG emissions summary**

In 2017 the Government of Alberta updated how they calculate emissions from methane in landfills. The carbon dioxide equivalent for methane increased from 21 to 25, resulting in increased emissions from Red Deer's landfills.

In order to compare apples to apples, and following Good Practice Guidance from the International Panel on Climate Change (https://www.ipcc-nggip.iges.or.jp/public/gp/english/7_Methodological.pdf page 7.18) we have recalculated emissions from solid waste in all previous years based on the revised emissions factor.

	2010	2011	2012	2013	2014	2015	2016	2017	Difference from 2010
GHG emissions (tCO2e) ORIGINAL	138,980	133,320	138,036	136,401	142,941	132,820	128,359	n/a	
GHG emissions (tCO2e) REVISED	151,347	145,830	150,706	149,241	155,985	146,079	141,931	140,067	11,280
Percent increase (+) or decrease (-) from previous year		-3.65%	+3.34%	-0.97%	+4.52%	-6.35%	-2.84%	-1.31%	-7.45%

Corporate GHG Sources 2010-2017

Emissions are fairly flat:

- Increasing emissions from the Waste Management Facility are currently offset by decreasing emissions from the 1972 Landfill, but this will change as more waste is added to the Waste Management Facility;
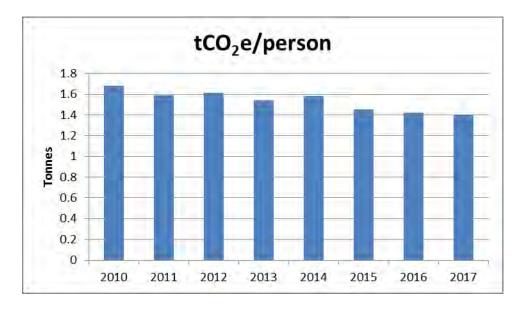- Natural gas, diesel, gasoline and wastewater boilers emissions are stable.

The bulk of the changes come from:
- Wastewater sludge, whose emissions can vary significantly from year to year;
- Electricity, which has decreased since 2012.

While The City is headed in the right direction overall with a 7.45% reduction in emissions since 2010, there is a ways to go to meet the recommended target of 30% reduction by 2020.

Though modest, reductions can be seen as somewhat positive since Red Deer's population continues to grow.

tCO$_2$e/person

However, reduction targets are based on absolute (total) rather than per capita emissions. This is important because (as per the 2010 Corporate Greenhouse Gas Inventory):

> "The intent of absolute targets is to set a cap for the annual quantity of GHG emissions being released into the atmosphere. Scientists have estimated the absolute maximum concentration of CO2 in the atmosphere and corresponding annual

emissions. This is a 'fixed' number. To avoid 'catastrophic climate related events', it is commonly accepted that we need to reduce emissions to 1990 levels for all future years… Absolute targets are the only way to control actual emissions and address climate change on a global level."

Actions taken in 2017

- Building methane capture infrastructure at Waste Management Facility
- Residential curbside organics collection pilot program continued with 2000 households, and plans progressed for city-wide roll-out in 2018
- Co-generation commissioning continues at Wastewater Treatment Plant
- Streetlight replacement with LEDs in progress throughout the city
- 16 Compressed Natural Gas buses added to the fleet
- Consultant hired to draft Green Building Policy
- Electric vehicle shared throughout City departments

What's Next

- Use Environmental Master Plan refresh to embed actions
- Continue to work on high priority actions for Behaviour Change, Operations & Maintenance and Capital Investment strategies
- Share building energy use information with building owners throughout the organization
- Use data collected from Fleet to inform actions to reduce emissions

Urban Forest Management Plan

The City's Environmental Master Plan identified the development and implementation of an Urban Forest Management Plan as a priority in 2011. In January of 2017, Urban Forest Innovations was hired to complete this plan, and did so with the input of City staff, Red Deer residents, and local stakeholders.

The plan was completed in January of 2018 and provides direction on how best to manage our urban forest. It utilizes guiding principles, strategic objectives, and action items to address best practices in monitoring, protecting, maintaining, and enhancing the urban forest, and provides metrics that can be used as evaluation tools to rank The City from low to high in regard to urban forest sustainability.

While this 20 year plan focuses primarily on planted trees in public spaces, it also addresses natural forested areas and privately owned trees.

The action items outlined in the Urban Forest Management Plan, which are linked to specific strategic objectives, are separated into four 5 year management periods. Implementation of some of those action items identified in the first management period (2018-2022) will begin in 2018, which include the following:

- Implement active adaptive urban forest management
- Promote the Urban Forest Management Plan and urban forestry programs to internal and external stakeholders
- Develop neighbourhood tree and forest assessments/plans
- Enhance interdepartmental (City) and interagency (external) urban forest collaboration
- Establish an urban forest reserve fund
- Adopt an asset management approach towards urban forestry
- Review existing and develop new Urban Forestry policies
- Streamline the request-based tree maintenance process
- Enhance tree risk assessment and management

- Increase integrated Pest Management (IPM) program capacity
- Enhance wildfire management
- Enhance protection of natural areas on future development lands
- Improve tree preservation processes and practices
- Improve tree establishment programs and practices
- Develop a tree compensation policy and investigate retaining securities for tree protection
- Create an urban forestry education/stewardship coordinator staff position
- Expand urban forestry education and engagement programs
- Enhance urban forestry education content
- Enhance Urban Forestry/Ecological Services online presence