DRAFT WORK PLAN AND INVENTORY METHODOLOGY

CHICAGO REGIONAL GREENHOUSE GAS EMISSIONS INVENTORY

PREPARED FOR:

Chicago Metropolitan Agency for Planning (CMAP)

PREPARED BY:

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1. Introduction

Purpose and Scope of the Project

The objective of this project is to develop a greenhouse gas (GHG) emissions inventory for 2015 for the Chicago Metropolitan Agency for Planning (CMAP). The inventory will cover the CMAP region, defined as the seven counties of Cook, DuPage, Kane, Kendall, Lake, McHenry, and Will, and will comply with the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC) BASIC level requirements. The project will also involve updating the region's 2010 inventory, analyzing results and trends, and developing emission projections. The results from this work will be documented in a final report, and will be used to gauge progress towards the *ON TO 2040* GHG reduction targets and identify new targets for the *ON TO 2050* comprehensive plan.

Key Points of Contact

ICF's main points of contact include the following:

Name	Role	Phone	Email
Emily Golla	Project Manager	(202) 862-1246	Emily.Golla@icf.com
Rich Walter	Principal in Charge	(510) 290-1860	Rich.Walter@icf.com
Anthony Chau	Contract Administrator	(703) 934-3714	Anthony.Chau@icf.com

CMAP's main points of contact include the following:

Name	Role	Phone	Email
Jared Patton	Project Manager	(312) 386-8623	jpatton@cmap.illinois.gov
Kristin Ihnchak	Principal, Local Planning	(312) 386-8834	kihnchak@cmap.illinois.gov
Bob Dean	Director of Planning	(312) 676-7462	BDean@cmap.illinois.gov
Penny Dubernat	Procurement Officer	(312) 386-8756	PDubernat@cmap.illinois.gov

2. Approach

This section summarizes ICF's approach to meeting the goals of this project. The work has been divided into the three following phases, in addition to a project management task, as described in our proposal:

- Project Management
- Phase 1: Define the Project Approach and Methodology and Collect Data
- Phase 2: Calculate and Analyze Regional Emissions
- Phase 3: Develop and Finalize Report

Project Management

ICF will work closely with CMAP throughout this project to ensure that our work is well informed and consistent with CMAP's objectives. To this end, ICF's Principal in Charge and Project Manager will participate in bi-weekly check-in calls with CMAP's Project Manager to discuss progress made, challenges encountered, and next steps. ICF will additionally be responsive on email and available by phone to answer questions or discuss time-sensitive issues in between routine check-in calls. ICF's Project Manager will coordinate the development of all deliverables across the project team and the Principal in Charge will provide overall quality assurance/quality control and direction to ensure the delivery of high quality work products that are consistent with CMAP expectations.

ICF's Project Manager will maintain a budget tracking tool to closely track and manage the budget. We will prepare monthly invoices and monthly progress reports that include a description of the services performed, the number of hours worked, and an itemization of travel and other costs.

Define the Project Approach and Methodology and Collect Data

As part of the first phase of this project, ICF will define the project approach and methodology and collect data for preparation of the GHG inventory. The specific tasks that will be undertaken to complete this phase of the work are described below.

Task 1.1: Define project work plan and inventory methodology

As a first step, ICF has prepared this draft work plan and inventory methodology. The work plan describes the scope of the assignment, our approach and proposed methodology for preparing the emissions inventory, anticipated data needs, and the project schedule, including the timeline for deliverables and a schedule for bi-weekly check-in calls with CMAP. As part of this document, ICF has defined the sectors/sub-sectors and scope of the inventory, identified proposed revisions to the methodology employed for the 2010 Regional Inventory, and identified differences in our approach relative to the 2015 Chicago Inventory.

Task 1.2: Present work plan and inventory methodology

Following delivery of the draft work plan and inventory methodology, ICF's Principal in Charge and Project Manager will meet with CMAP by phone to review and discuss the draft work plan and inventory methodology. ICF will prepare a presentation based on the draft document that summarizes key information from the work plan, timeline, and methodology. ICF's Principal in Charge and Project Manager will travel to Chicago and present the information to CMAP's Environment and Natural Resources working committee on November 2, 2017. ICF will gather feedback from CMAP and the committee and update the work plan and methodology, accordingly.

Task 1.3: Obtain inventory data

In conjunction with the development of this work plan and inventory methodology, ICF has prepared a detailed list of anticipated data needs (see Section 4). These needs will also be documented in a data collection template that will be used to facilitate the data collection and tracking process. ICF will work with CMAP to identify data sources, establish responsibilities for data collection, and conduct outreach to collect data. In cases where data gaps exist, ICF will identify options for filling data gaps.

Calculate and Analyze Regional Emissions

As part of the second phase of this project, ICF will calculate the 2015 emissions inventory, update the 2010 emissions inventory, analyze the results, forecast future emissions, and propose options for ON TO 2050 emission targets. The specific tasks that will be undertaken to complete this phase of the work are described below.

Task 2.1: Calculate, analyze, and produce the 2015 emissions inventory and 2010 inventory update

Under this task, ICF will develop the 2015 regional inventory that is consistent with the GPC at the BASIC level. ICF will also update the 2010 regional inventory to comply with GPC Protocol requirements using readily available data. Inventory results will be presented in aggregate, by sector, by county, and on a per capita basis. Emission totals for the City of Chicago and suburban Cook County will also be broken out and presented separately. ICF will compare emissions from each sector, sub-sector, scope, and geography for the 2010 inventory with the 2015 inventory to identify key trends. We will also analyze results relative to the region's population, households, employment, GDP, and heating and cooling days.

Once the 2010 update and 2015 inventories are complete, ICF will forecast emissions for 2020, 2025, 2030, 2035, 2040, 2045, and 2050 using population growth estimates provided by CMAP. Emission projections will be calculated for three separate scenarios in which per capita emissions are assumed to (1) remain constant, (2) increase, and (3) decrease. ICF will work with CMAP to determine the appropriate magnitude of the increase and decrease for the various scenarios.

The inventory calculations, emission forecasts, and analysis will be documented in a series of Microsoft Excel workbooks that build off of the spreadsheets used to calculate the 2010 inventory.

Task 2.2: Propose potential ON TO 2050 emissions targets

Based on the 2015 regional emissions inventory and forecasted emissions, ICF will identify at least three options for emissions targets for 2020, 2035, and 2050. ICF will consider goals set by other jurisdictions and sector-specific trends in the developing our proposal. We will also take into consideration what is likely to be technically feasible and economically cost-effective.

Develop and Finalize Report

As part of the third phase of this project, ICF will prepare the 2015 regional inventory report. The specific tasks that will be undertaken to complete this phase of the work are described below.

Task 3.1: Prepare draft report

Following delivery of the inventory spreadsheets, ICF will prepare the draft regional greenhouse gas emissions inventory report. Key steps that we will follow to prepare the draft report include:

1. **Develop Creative Brief:** The creative brief will identify the target audience(s), objectives, key messages, outline, and look and feel for the report. The creative brief will establish agreement between ICF and CMAP on key characteristics of the report. ICF will work with CMAP to develop and refine this brief to ensure that all parties have a shared vision for the report.
2. **Develop Report Template:** Using the agreed-upon creative brief as a guide, ICF will leverage its graphic design team to develop a visually appealing, public-facing template using Microsoft Word. The template will cover all sections identified in the outline developed as part of the creative brief, and will include cover art, graphic elements, tables, graphs, figures, textboxes, and equations.
3. **Draft Content:** The draft report will succinctly present the inventory results and emission projections consistent with GPC requirements; summarize the methodology, data sources, and assumptions used to develop the estimates; and describe emission trends. The report will also include an executive summary, a background section, and a summary of key data limitations and modeling uncertainties.

Task 3.2: Present draft report

Based on any initial feedback provided by CMAP, ICF will modify the draft report. ICF's Principal in Charge and Project Manager will then travel to Chicago and present the results to CMAP's Environment and Natural Resources working committee at the April 2018 committee meeting.

Task 3.3: Finalize and submit the report and other deliverables

Based on feedback provided by CMAP's Environment and Natural Resources working committee, ICF will update the inventory report and submit it to CMAP for final review. ICF will revise and finalize the report based on this final round of feedback. ICF will also finalize the inventory spreadsheets and any other supporting documentation. At the same time, ICF will prepare and submit a letter stating that the inventory complies with GPC requirements.

3. Proposed Methodology

The proposed methodology that ICF will use to develop the emissions inventory is described in the sections below by sub-sector. Updates relative to the methodology used for the 2010 Regional Inventory and a comparison with the 2015 City of Chicago inventory is also presented.

Stationary Energy

Residential Buildings

Proposed Methodology

Stationary energy emissions from residential buildings will be estimated based primarily on electricity and natural gas data specific to each jurisdiction, as provided by the utilities that serve the Chicago Region. Emissions from electricity use will be calculated by multiplying consumption data by the current CO_2, CH_4, and N_2O emission factors for the RFCW eGRID sub-region. Emissions from natural gas will be calculated by multiplying consumption data by CO_2, CH_4, and N_2O emission factors from the U.S. Environmental Protection Agency's (EPA) *Inventory of U.S. Greenhouse Gas Emissions and Sinks.*

ICF will additionally review data from the U.S. Energy Information Administration (EIA) to determine if stationary combustion emissions for other fuels can be estimated in the Residential Buildings sub-sector. If data are available, emissions will be estimated by multiplying consumption of each fuel type by fuel-specific CO_2, CH_4, and N_2O emission factors from EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks.*

Updates relative to the 2010 Regional Inventory

An average eGRID emission factor will be used for the region to estimate Scope 2 electricity emissions, rather than a custom emission factor, for consistency with the 2015 Chicago Inventory. In addition, average emission factors will be used to estimate natural gas emissions, compared with the custom CH_4 emission factor used in the 2010 Regional Inventory. Global warming potentials (GWP) from the *Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report* will be used instead of values from the *IPCC Second Assessment Report*. The information will be presented by sub-sector, rather than by fuel source.

Comparison to 2015 Chicago Inventory

No deviation.

Commercial and Institutional Buildings and Facilities

Proposed Methodology

Stationary energy emissions from commercial and institutional buildings and facilities will be estimated based primarily on electricity and natural gas data specific to each jurisdiction, as provided by the utilities that serve the Chicago Region. Emissions from electricity use will be calculated by multiplying consumption data by the current CO_2, CH_4, and N_2O emission factors for the RFCW eGRID sub-region. Emissions from natural gas will be calculated

by multiplying consumption data by CO_2, CH_4, and N_2O emission factors from EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks.*

ICF will additionally review data reported under EPA's Greenhouse Gas Reporting Program (GHGRP) and EIA data to estimate stationary combustion emissions for other fuels in the Commercial and Institutional Buildings and Facilities sub-sector. If emissions data from GHGRP are available, those will be used. If consumption data are available, emissions will be estimated by multiplying consumption of each fuel type by fuel-specific CO_2, CH_4, and N_2O emission factors from EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks.*

Updates relative to the 2010 Regional Inventory

An average eGRID emission factor will be used for the region to estimate Scope 2 electricity emissions, rather than a custom emission factor, for consistency with the 2015 Chicago Inventory. GWP values from the *IPCC Fifth Assessment Report* will be used instead of values from the *IPCC Second Assessment Report*. The information will be presented by sub-sector, rather than by fuel source. In addition, energy emissions that were reported under the Wastewater and Water Consumption sectors will be incorporated into this sub-sector.

Comparison to 2015 Chicago Inventory

Emissions from water conveyance and treatment were presented separately in the 2015 Chicago Inventory.

Manufacturing Industries and Construction

Proposed Methodology

Stationary energy emissions from manufacturing industries and construction will be estimated based primarily on electricity and natural gas data specific to each jurisdiction, as provided by the utilities that serve the Chicago Region. Emissions from electricity use will be calculated by multiplying consumption data by the current CO_2, CH_4, and N_2O emission factors for the RFCW eGRID sub-region. Emissions from natural gas will be calculated by multiplying consumption data by CO_2, CH_4, and N_2O emission factors from EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks.*

ICF will additionally review GHGRP and EIA data to estimate stationary combustion emissions for other fuels in the Manufacturing Industries and Construction sub-sector. If emissions data from GHGRP are available, those will be used. If consumption data are available, emissions will be estimated by multiplying consumption of each fuel type by fuel-specific CO_2, CH_4, and N_2O emission factors from EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks.*

Updates relative to the 2010 Regional Inventory

An average eGRID emission factor will be used for the region to estimate Scope 2 electricity emissions, rather than a custom emission factor, for consistency with the 2015 Chicago Inventory. GWP values from the *IPCC Fifth Assessment Report* will be used instead of values from the *IPCC Second Assessment Report*. The information will be presented by sub-sector, rather than by fuel source. In addition, stationary combustion emissions that were reported under the Stationary, Industrial, and Product Use sector will be incorporated into this sub-sector.

Comparison to 2015 Chicago Inventory

No deviation.

Energy Industries

Proposed Methodology

Stationary energy emissions from energy industries will be estimated by compiling emissions data from energy generation units that report under EPA's GHGRP. ICF will review available data on energy generating units in the region and cross-check that with entities reporting through EPA's GHGRP to ensure completeness. If any energy generation units do not report through EPA's GHGRP, ICF will review available facility-level data from EIA and estimate emissions by multiplying consumption of each fuel type by fuel-specific CO_2, CH_4, and N_2O emission factors from EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks.*

Updates relative to the 2010 Regional Inventory

Emissions from energy industries that were reported under the Stationary, Industrial, and Product Use sector will be incorporated into this sub-sector.

Comparison to 2015 Chicago Inventory

Only data reported under EPA's GHGRP were included in the 2015 Chicago Inventory.

Agriculture, Forestry, and Fishing Activities

Proposed Methodology

No emission sources are anticipated under this sub-sector.

Updates relative to the 2010 Regional Inventory

Not included in the 2010 Regional Inventory.

Comparison to 2015 Chicago Inventory

Not included in the 2015 Chicago Inventory.

Non-Specified Sources

Proposed Methodology

No emission sources are anticipated under this sub-sector.

Updates relative to the 2010 Regional Inventory

Not included in the 2010 Regional Inventory.

Comparison to 2015 Chicago Inventory

Emissions from water conveyance and treatment and wastewater treatment were reported under this sub-sector in the 2015 Chicago Inventory, but will be included in the Commercial and Institutional Buildings and Facilities sub-sector in the 2015 Regional Inventory.

Fugitive Emissions from Mining, Processing, Storage, and Transportation of Coal

Proposed Methodology

No emission sources are anticipated under this sub-sector as there is no coal production in the Chicago Region.

Updates relative to the 2010 Regional Inventory

Not included in the 2010 Regional Inventory.

Comparison to 2015 Chicago Inventory

Not included in the 2015 Chicago Inventory.

Fugitive Emissions from Oil and Natural Gas Systems

Proposed Methodology

Fugitive emissions from oil and natural gas systems will be estimated by compiling emissions data reported under EPA's GHGRP. Other data sources including EIA, Natural Gas STAR, and EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks* will be reviewed to determine if there are additional emissions from this sub-sector that are not captured under EPA's GHGRP. The methodology used to estimate emissions from sources not covered under EPA's GHGRP will be determined based on type of data available.

Updates relative to the 2010 Regional Inventory

Not included in the 2010 Regional Inventory.

Comparison to 2015 Chicago Inventory

Only data reported under EPA's GHGRP by People's Gas were included in the 2015 Chicago Inventory. Fugitive emissions from oil systems were not included.

Transportation

On-Road

Proposed Methodology

On-road transportation emissions will be calculated based on vehicle miles traveled (VMT) by transportation mode and vehicle type. VMT data by county and emissions factors broken out by vehicle class, fuel type, and age distribution will be provided by CMAP based on the EPA MOVES2014a model. Emissions from on-road alternative fuel vehicles (AFVs) will be estimated separately by taking national AFV vehicle population/mileage data from either the U.S. Department of Energy's (DOE) Transportation Energy Data Book or EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks*, and scaling it down to the CMAP region based on vehicle population data. Emissions from electric vehicles will be subtracted from the Residential Buildings and Commercial and Institutional Buildings and Facilities sub-sectors to avoid double counting.

Updates relative to the 2010 Regional Inventory

The latest version of the MOVES model (MOVES2014a) will be used to identify regional VMT data and emission factors for 2015. The 2010 inventory used MOVES2010. GWP values from the *IPCC Fifth Assessment Report* will be used instead of values from the *IPCC Second Assessment Report*.

Comparison to 2015 Chicago Inventory

VMT data and emissions factors were not broken out by fuel type.

Railways

Proposed Methodology

Emissions from passenger and freight rail will be calculated by applying appropriate emissions factors to CMAP regional rail activity data for both passenger and freight rail. ICF will obtain activity data from various data sources, including the Regional Transit Authority, National Transit Database, Amtrak, the Northern Indiana Commuter Transportation District, Metra Rail, the Chicago Transit Authority, Bureau of Transportation Statistics, and the Association of American Railroads. Rail data will be scaled down to the regional level using route mileage data provided by CMAP as well as route maps, timetables, and/or GIS mapping, where feasible.

Updates relative to the 2010 Regional Inventory

Emissions factors will be updated, as appropriate, based on new information from the American Association of Railroads, Regional Transit Authority and/or other agencies. GWP values from the *IPCC Fifth Assessment Report* will be used instead of values from the *IPCC Second Assessment Report*.

Comparison to 2015 Chicago Inventory

Only included emissions from passenger rail; emissions from freight were not included.

Waterborne Navigation

Proposed Methodology

Emissions from waterborne navigation will be calculated by taking in account emissions from both recreational (i.e., pleasure craft) and commercial activities depending on available data. For recreational boats, activity and emissions factor data will sourced from the NONROAD component of the MOVES2014a model as provided by CMAP. For commercial boats, ICF will contact water-based transportation service providers such as tour companies and water ferries to obtain activity data. Fuel-specific emissions factors will be obtained from EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks*.

Updates relative to the 2010 Regional Inventory

Not included in the 2010 Regional Inventory.

Comparison to 2015 Chicago Inventory

Emissions from personal recreational boats (e.g., stern drive, outboard spark ignition engines) and water taxis (e.g., Chicago Water Taxi) not included.

Aviation

Proposed Methodology

Emissions from the direct combustion of fuel for aviation trips that occur within the CMAP region (i.e., trips that depart and land within the region) will be calculated by obtaining activity data (e.g., fuel consumption) from regional helicopter service providers. Fuel-specific emissions factors will be obtained EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks*. Emissions from landing and takeoff will not be included as these emissions are not required for GPC Basic reporting.

Updates relative to the 2010 Regional Inventory

Not included in the 2010 Regional Inventory.

Comparison to 2015 Chicago Inventory

Included landing and takeoff emissions from aircraft-related operations activity occurring at O'Hare and Midway airports. This included both aviation and operation activities.

Off-Road

Proposed Methodology

Emissions from off-road vehicles and equipment will be estimated using activity data and emissions factors from the NONROAD components of EPA's MOVES2014a model. Off-road vehicles and equipment include agricultural equipment, construction and mining equipment, off-road trucks, lawn and garden equipment, airport support equipment, industrial and commercial equipment, logging equipment, railroad support equipment, and recreational equipment.

Updates relative to the 2010 Regional Inventory

The latest version of NONROAD model, which is now included within EPA's MOVES2014a model, will be used to identify activity data and emission factors for 2015. The 2010 inventory used NONROAD2008. GWP values from the *IPCC Fifth Assessment Report* will be used instead of values from the *IPCC Second Assessment Report*.

Comparison to 2015 Chicago Inventory

No deviation.

Waste

Disposal of Solid Waste Generated in the City

Proposed Methodology

Emissions from waste generated within the CMAP region, including waste landfilled in the region and waste exported for landfilling outside the region, will be calculated using the methane commitment method outlined in the GPC, consistent with the 2015 Chicago Inventory.

Updates relative to the 2010 Regional Inventory

Instead of the methane commitment method, the 2010 Regional Inventory used the waste-in-place method to quantify landfill emissions. In addition to changing the methodology, GWP values from the *IPCC Fifth Assessment Report* will be used instead of values from the *IPCC Second Assessment Report*.

Comparison to 2015 Chicago Inventory

No deviation.

Biological Treatment of Waste Generated in the City

Proposed Methodology

Emissions from the biological treatment of waste will be calculated based on the quantity of waste composted and emission factors for composting. The quantity of waste composted in the region will be estimated using a national per capita average or as a percentage of total waste generated. Data collected for the 2015 Chicago Inventory will also be considered. Emission factors will be taken from the *2006 IPCC Guidelines for National Greenhouse Gas Inventories.*

Updates relative to the 2010 Regional Inventory

Not included in the 2010 Regional Inventory.

Comparison to 2015 Chicago Inventory

Emissions were calculated using data from the City of Chicago Department of Streets and Sanitation and the Chicago Park District rather than using a broader factor to estimate composting totals.

Incineration and open burning of waste generated in the city

Proposed Methodology

Emissions from the incineration of waste will be calculated based on the occurrence and availability of data on municipal incineration and medical incineration. ICF will first confirm that no municipal incineration is currently occurring. ICF will examine if medical incineration should be included based on practices in the region and the availability of data. However, based on previous analyses conducted by ICF, it is believed that a regular source of data on the inventory of medical waste incinerators does not exist and that emissions from medical waste incineration should be considered a de minimis source of emissions.

Emissions from the open burning of waste will not be quantified as open burn permits are commonly only given for burning of biomass (for agriculture and habitat restoration purposes), which results primarily in biogenic emissions and limited non-biogenic emission. Biomass is not considered "waste" per GPC.

Updates relative to the 2010 Regional Inventory

Not included in the 2010 Regional Inventory.

Comparison to 2015 Chicago Inventory

Not included in the 2015 Chicago Inventory.

Wastewater generated in the city

Proposed Methodology

Wastewater emissions will be calculated based on fugitive emissions and energy use rates reported for Metropolitan Water Reclamation District (MWRD) treatment plants. For the remainder of the region not covered by the MRWD plants, emissions will be calculated based on per-capita emission factors using data reported by MRWD plants.

Updates relative to the 2010 Regional Inventory

No deviation.

Comparison to 2015 Chicago Inventory

No deviation.

4. Anticipated Data Needs

The anticipated data needs to develop the emissions inventory are summarized in the table below by sub-sector. Possible sources of data are also presented.

Sector/Sub-Sector	Data Needs	Proposed Data Source
Stationary Energy		
Residential buildings	• Electricity consumption • Natural gas consumption • Other fuel consumption	• People's Gas • Commonwealth Edison • Illinois Municipal Electric Agency • NICOR Gas • EIA
Commercial and institutional buildings and facilities	• Electricity consumption • Natural gas consumption • Other fuel consumption	• People's Gas • Commonwealth Edison • Illinois Municipal Electric Agency • NICOR Gas • EIA • EPA's GHGRP
Manufacturing industries and construction	• Electricity consumption • Natural gas consumption • Other fuel consumption	• People's Gas • Commonwealth Edison • Illinois Municipal Electric Agency • NICOR Gas • EIA • EPA's GHGRP
Energy industries	• Energy consumption by fuel type for energy generation units • Emissions from energy generation units	• EPA's GHGRP • EIA • Commonwealth Edison

		• Illinois Municipal Electric Agency
Agriculture, forestry, and fishing activities	• NA	• NA
Non-specified sources	• NA	• NA
Fugitive emissions from mining, processing, storage, and transportation of coal	• NA	• NA
Fugitive emissions from oil and natural gas systems	• Emissions from oil and gas operations (e.g., refineries)	• EPA's GHGRP • EIA • Natural Gas STAR
Transportation		
On-road	• On-road vehicle VMT, fuel consumption, and emissions factors • Alternative fuel vehicle VMT	• EPA MOVES2014a • EPA U.S. GHG Inventory • Transportation Energy Data Book
Railways	• Railroad operating data including route mileage, maps, and time tables	• Regional Transit Authority • National Transit Database • Amtrak • Northern Indiana Commuter Transportation District • Metra Rail • Chicago Transit Authority • Bureau of Transportation Statistics • Association of American Railroads
Waterborne navigation	• Fuel consumption for recreational and commercial boats	• EPA MOVES2014a model, NONROAD component • Local commercial/tour boat service providers
Aviation	• Fuel consumption from intraregional aviation (i.e., helicopters)	• Local helicopter service providers
Off-road	• Fuel consumption for off-road vehicles and equipment	• EPA MOVES2014a model, NONROAD component
Waste		

Disposal of solid waste generated in the city	• List of open and closed landfills in the region, including dates of opening/closure • List of landfills used by private haulers and DSS • Landfill gas capture practices at landfills • Annual amount landfilled and waste composition	• Chicago Department of Environment • CDM waste composition studies • U.S. EPA Landfill Methane Outreach Program
Biological treatment of waste generated in the city	• Amount of waste composted and waste composition at facilities in the region	• City of Chicago Department of Streets and Sanitation • Chicago Park District • U.S. EPA national average data
Incineration and open burning of waste generated in the city	• Medical incineration practices and volume incinerated	• TBD
Wastewater generated in the city	• Names and locations of wastewater treatment plants (WWTPs) serving the region • Population served by WWTPs and percentage that resides in the city and each county • Per-capita or total wastewater generation • Information on methane capture and recovery systems at each WWTP	• Metropolitan Water Reclamation District of Greater Chicago (MRWD) • U.S. EPA Integrated Compliance Information System (ICIS)

5. Project Schedule

Key project milestones together with the project timeline are summarized in the table below. In addition to the milestones identified, ICF's Project Manager and Principal in Charge will participate in bi-weekly check-in calls with CMAP's Project Manager (scheduled for Wednesdays at 2pm CT) and prepare monthly invoices and progress reports in accordance with the project management task.

Key Project Milestones

Task	Deliverable/Milestone	Deadline
1.1	Draft work plan and inventory methodology	October 26, 2017
1.2	Present draft work plan and inventory methodology	November 2, 2017
1.2	Final work plan and inventory methodology	December 1, 2017
2.1	2015 GHG emissions inventory and 2010 inventory update	February 1, 2018
2.2	Proposed ON TO 2050 emissions targets	February 1, 2018
3.1	Draft regional GHG emissions inventory report	March 19, 2018
3.2	Present draft regional GHG emissions inventory report	April 2018
3.3	Final regional GHG emissions inventory report	April 23, 2018