



Photo Credits: Ralph Weisheit / WGLT

Developing a 2022 Greenhouse Gas (GHG) Model For McLean County

Illinois Modeling Users Group (ILMUG)

Friday, April 4th, 2025 Meeting

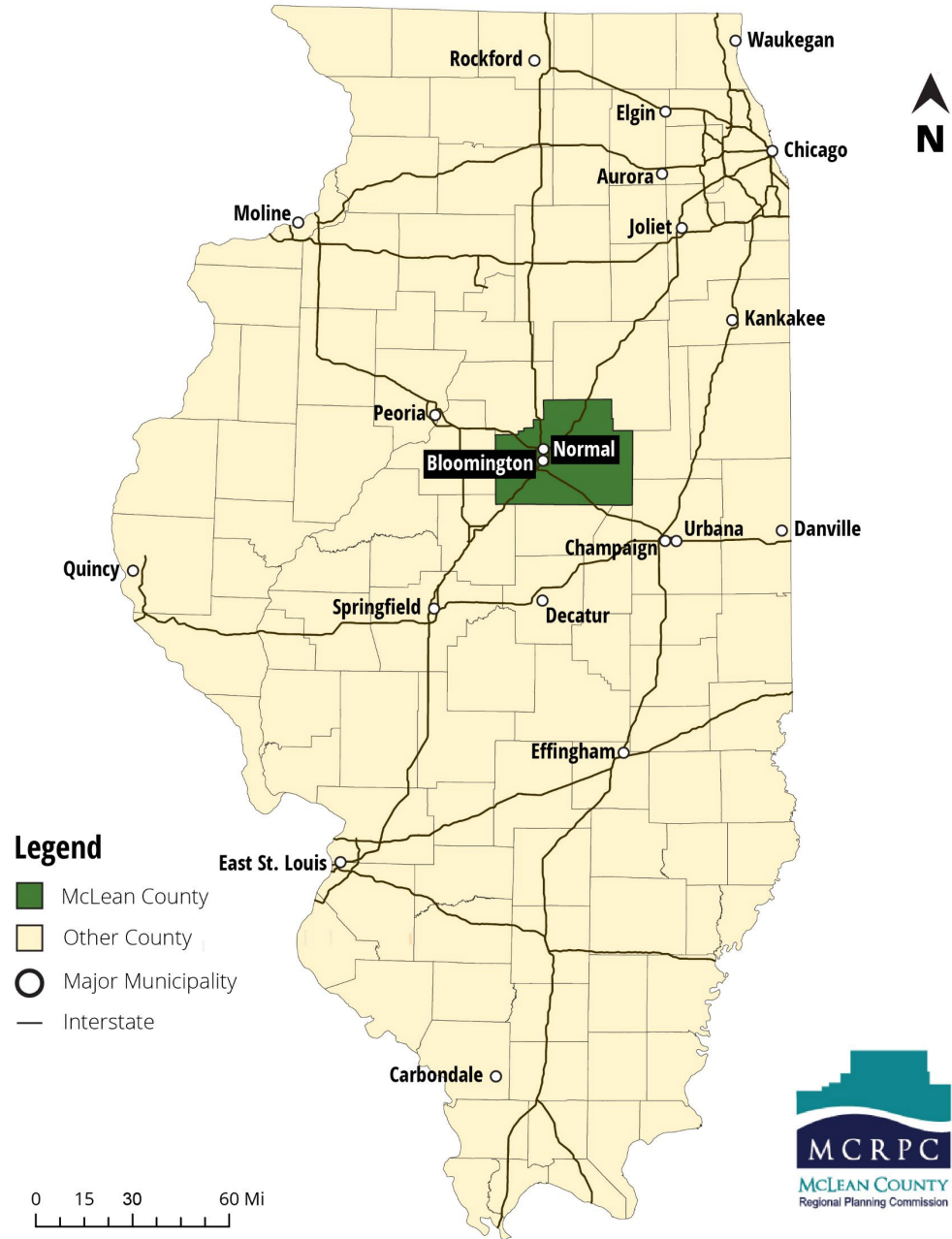


This presentation and the *McLean County MOVES Model* was inspired and guided by the *Champaign County MOVES Model* developed by the Champaign County Regional Planning Commission



Motor Vehicle Emissions Simulator (MOVES)

Regional Context of McLean County



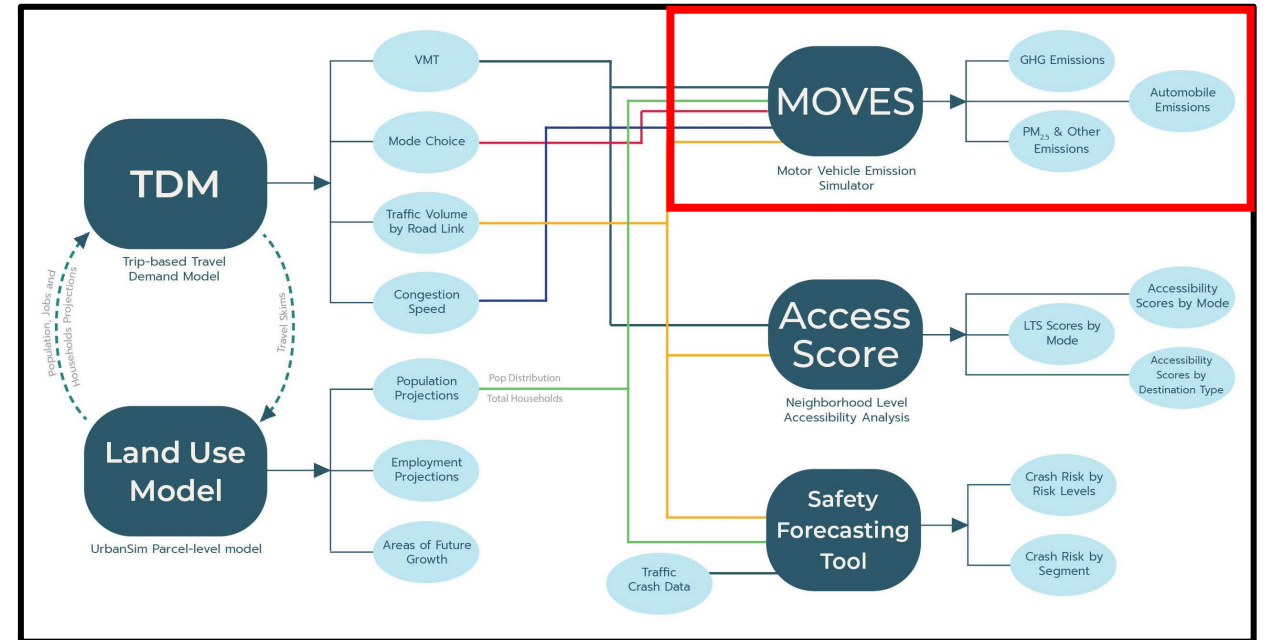
Overview

- Introduction
- Brief Overview of the McLean County Travel Demand Model (TDM)
- 2022 McLean County Greenhouse Gas (GHG) Model
- Use of Data and Next Steps

Introduction

- **Main Software:**
 - MOVES 4 GUI (released 2023)
 - CUBE Voyager
- **Simulation Year:** 2022
- **Area Covered:** McLean County, Illinois
- **Roadways:** Interstates, Arterials, Collectors
- **Model Type:** On-road Emissions
- **Main Objective:** Calculate GHG Emissions in McLean County for the year 2022 in order to establish a GHG reduction plan & to complement TIPs/LRTPs/other plans

CUUATS Modeling Suite



Source: Champaign County Regional Planning Commission - CUUATS

McLean County Travel Demand Model (TDM)

- McLean County's traditional four-step **Travel Demand Model (TDM)** was used to develop several inputs for MOVES:
 - Vehicle Miles Traveled (VMT) by Vehicle Type
 - Vehicle Miles Traveled (VMT) by Road Type
 - Average Speed Distribution
- **Original Base Year: 2019**
- **New Base Year: 2022**
- Only *socio-economic data* was updated to 2022. All other components of the TDM retained their 2019 characteristics



CUBE
CONNECT Edition

Model Study Area

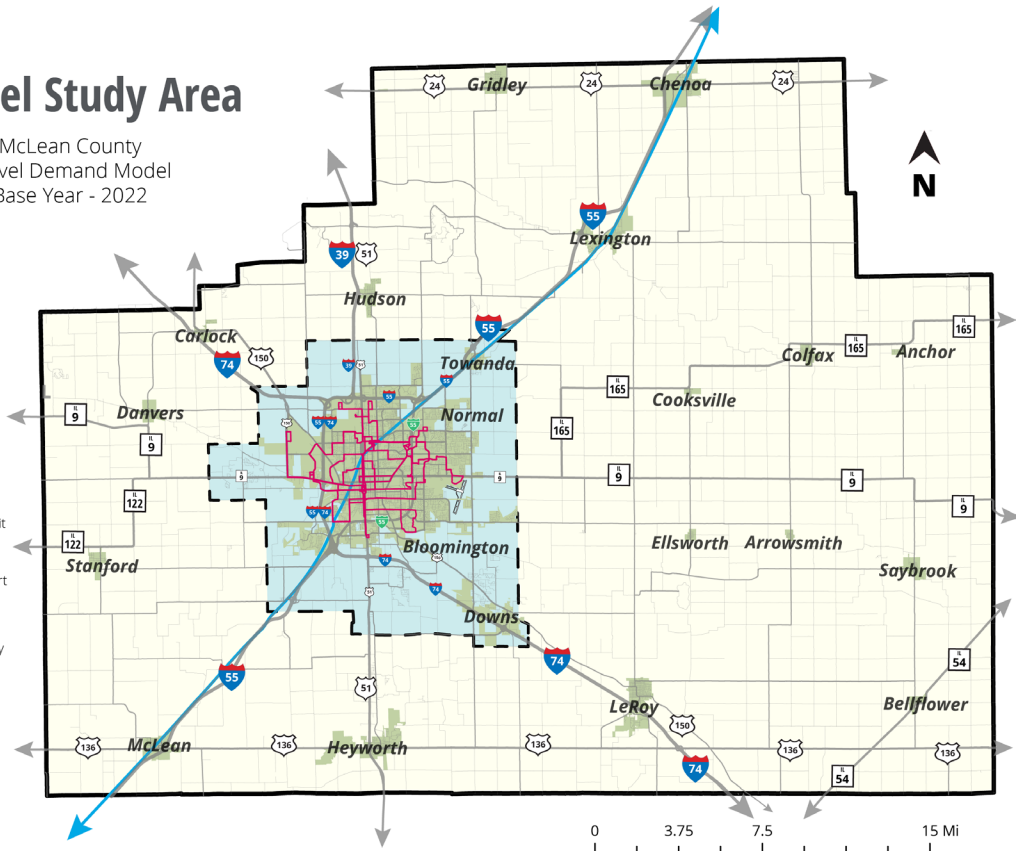
McLean County
Travel Demand Model
Base Year - 2022

Legend

- Road Class**
 - Interstate
 - Major Arterial
 - Minor Arterial
 - Collector
 - Local Roads/Streets
- Other Elements**
 - Amtrak
 - Connect Transit Bus Routes
 - Central Illinois Regional Airport
 - Metropolitan Planning Area
 - McLean County Border
 - Incorporated Municipality

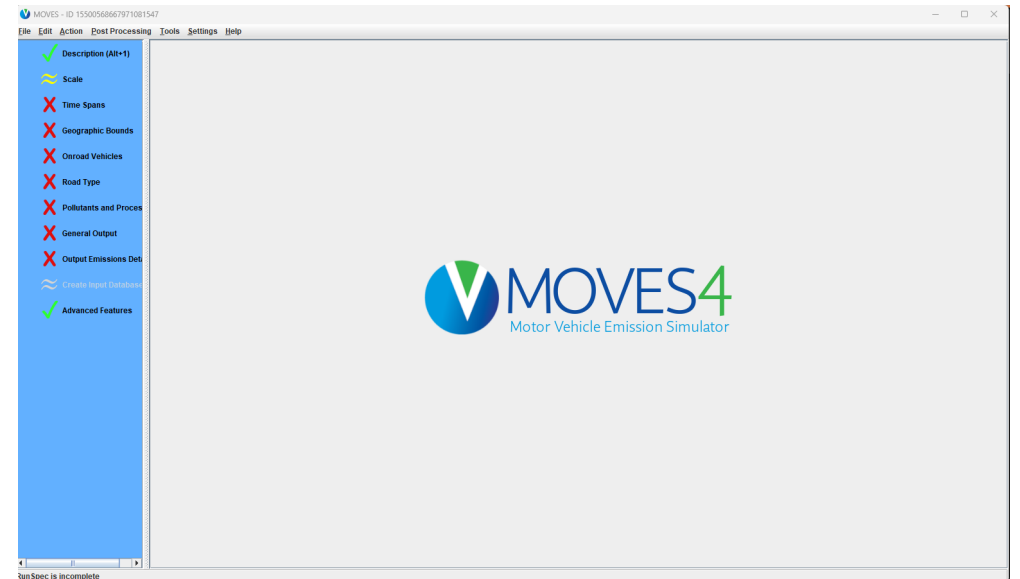


Data Source: McGIS Database



MOVES 4 GUI

- **MO**tor **V**ehicle **E**missions **S**imulator (**MOVES**)
- **Estimates:** Transportation emissions
- **Scale:** County
- **Model Year:** 2022



On-Road Emissions vs. Non-Road Emissions

On-Road

Vehicles used on roads for transportation of passengers or freight

Non-Road

- Agriculture
- Airport Support
- Commercial
- Construction
- Industrial
- Lawn/Garden
- Underground Mining
- Oil Field
- Pleasure Craft
- Railroad
- Recreational
- Logging

Input Data Overview

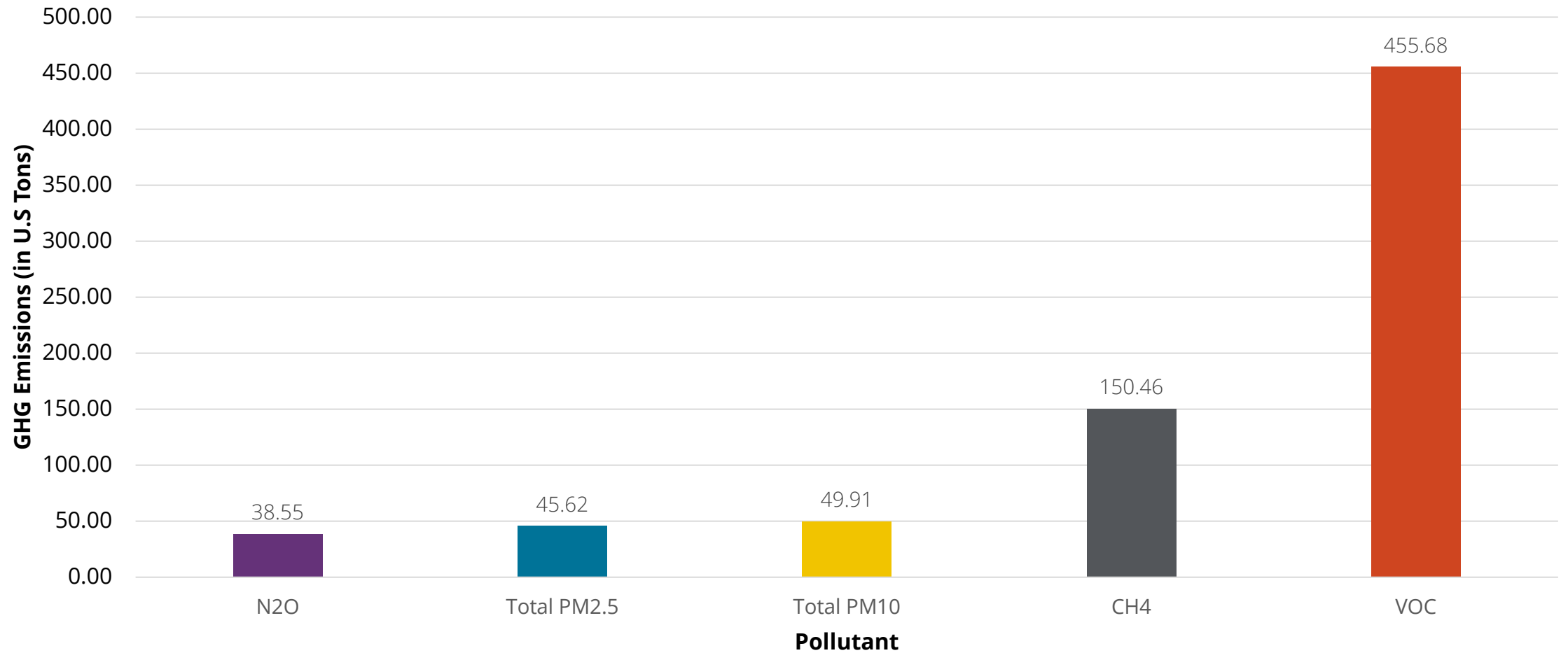
Data Point(s)	Source
Vehicle Population by Type	Illinois Secretary of State (SOS) – 2024 McLean County Vehicle List
Vehicle Age Distribution	
VMT by Vehicle Type	McLean County TDM 2022 Base Year Model & 2022 Illinois Travel Statistics (IDOT)
VMT by Road Type	McLean County TDM 2022 Base Year Model
Average Speed Distribution	
Meteorological Data	Meteostat (Python Package)
Month/Day/Hour VMT Fractions	MOVES Default Data
Fuel Supply/Formation	

Formula/Abbreviation Explanation of Pollutants

Formula/Abbreviation	Description
N2O	Nitrous Oxide
Total PM2.5	2.5 micrometers of Particulate Matter
Total PM10	10 micrometers of Particulate Matter
CH4	Methane
VOC	Volatile Organic Compounds
NOX	Oxides of Nitrogen
CO2	Atmospheric CO2
CO2 Equiv	CO2 Equivalent

Annual GHG Emissions in McLean County, 2022

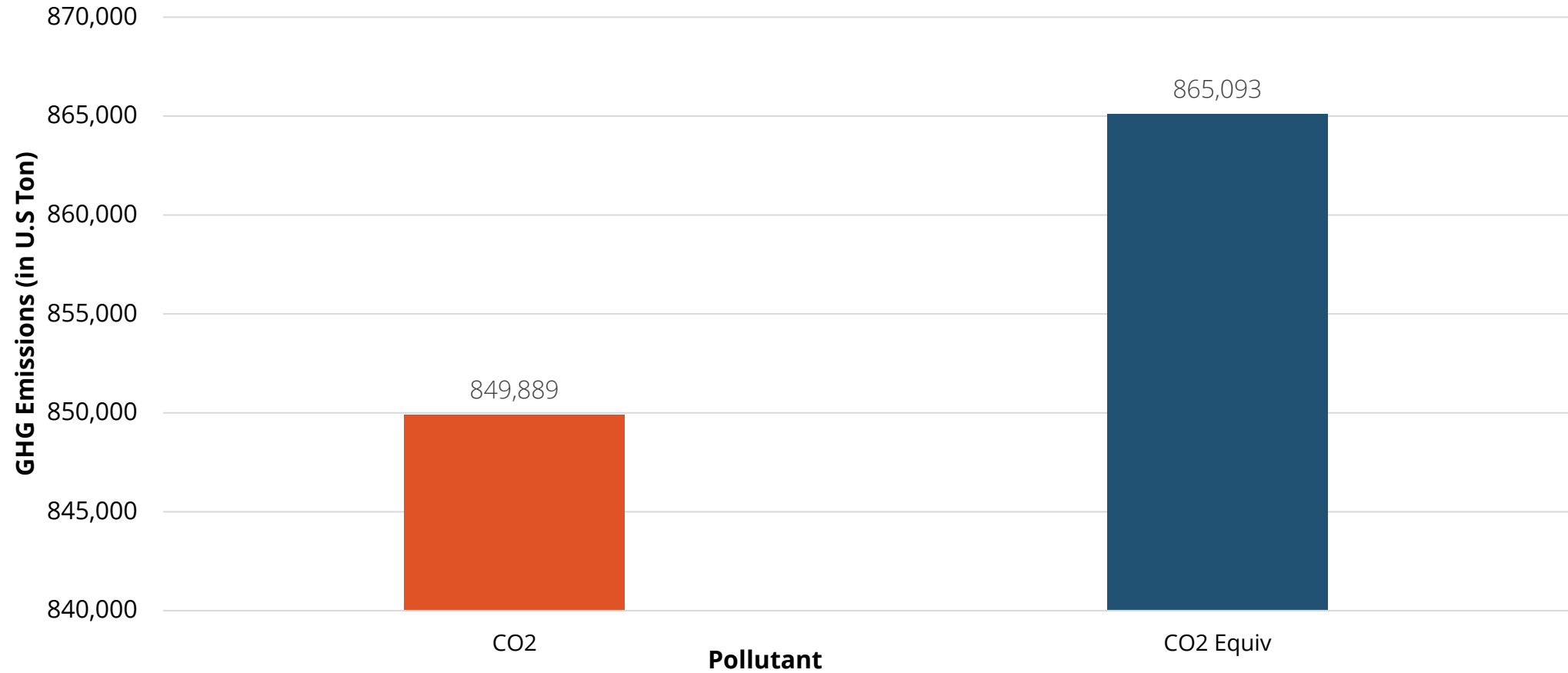
N2O, Total PM2.5, Total PM10, CH4, VOC



Note: Since MOVES measures transportation emissions only, the output data cannot be accurately compared with the NAAQS attainment level requirement as that accounts for all sectors

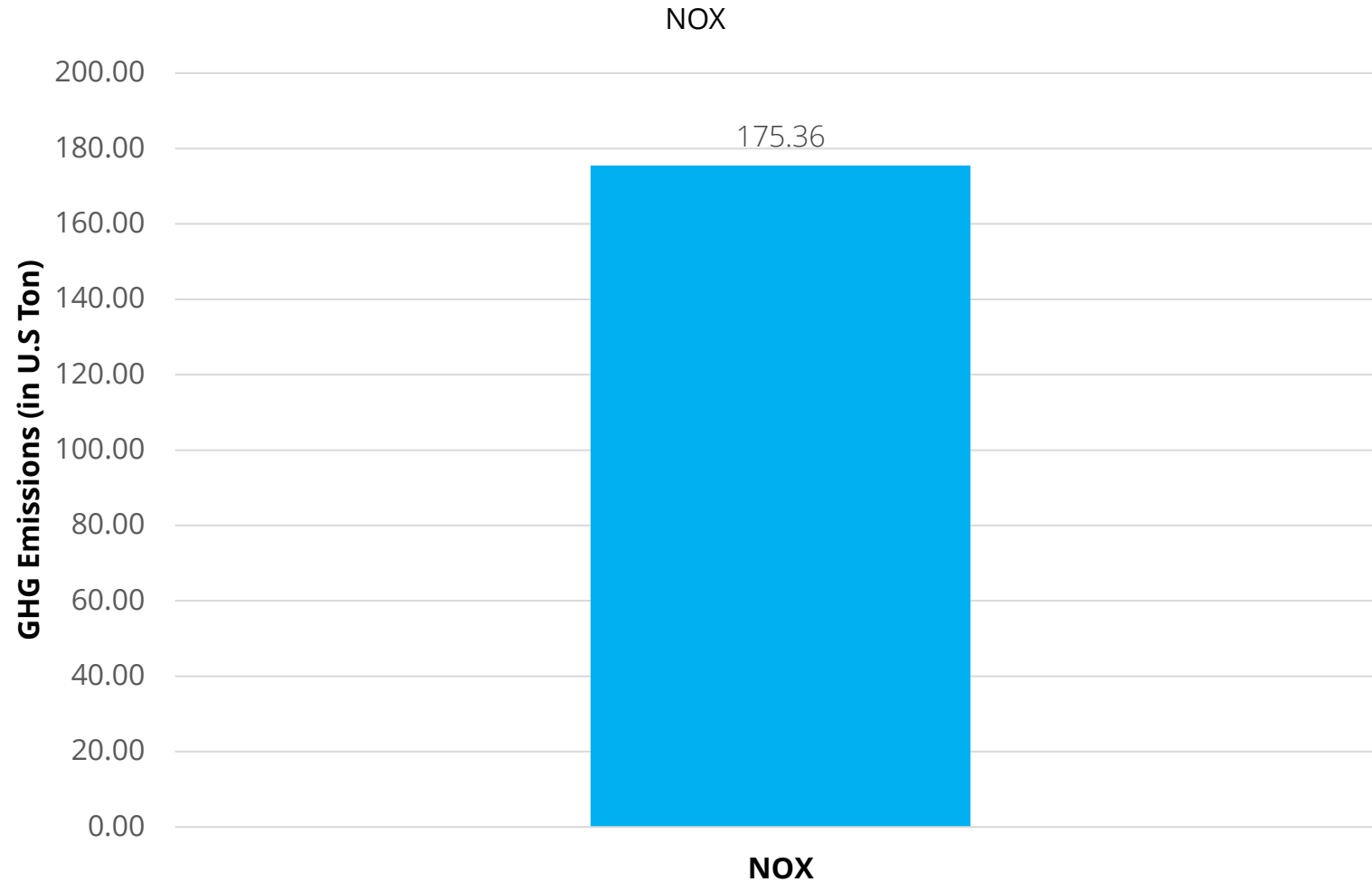
Annual GHG Emissions in McLean County, 2022

CO2 and CO2 Equiv



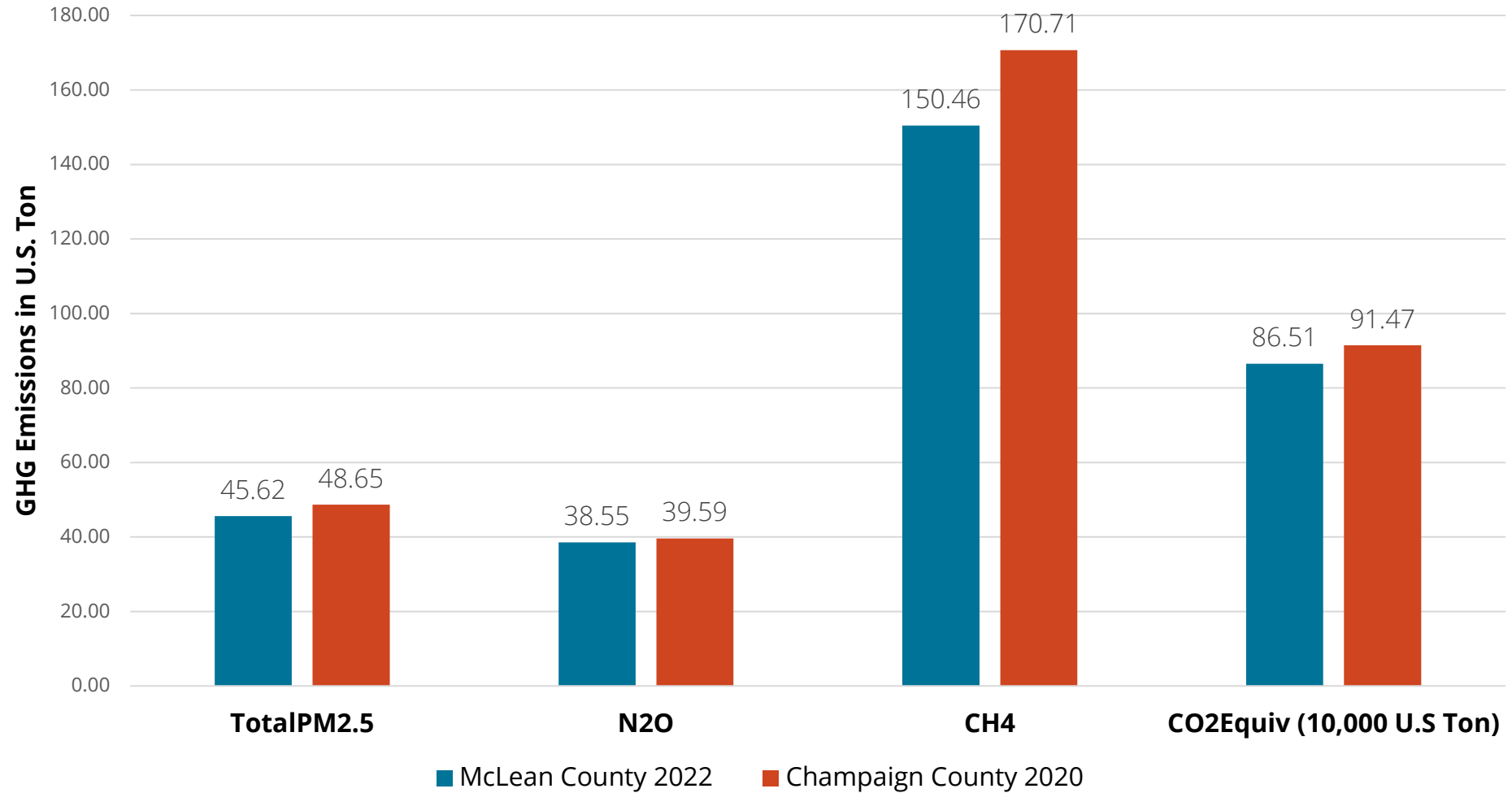
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Annual GHG Emissions in McLean County, 2022



Note: Since MOVES measures transportation emissions only, the output data cannot be accurately compared with the NAAQS attainment level requirement as that accounts for all sectors

GHG Emissions Comparison Between McLean County (2022) & Champaign County (2020)



Note: These pollutants were included in CCRPC's Long Range Transportation Plan (LRTP) 2050

Use of Data & Next Steps

- **GHG Modeling outputs can assist with:**
 - TDM Scenarios
 - County-wide GHG Reduction Plan
 - Short- and Long-Range Transportation Plans (LRTPs)
 - Transportation Improvement Programs (TIPs)
 - *New* McLean County Regional Comprehensive Plan
 - *New* McLean County & B-N Urban Area Strategic Land Use Plan
- **Access to New & Updated Software**
 - MOVES 5 (released November 2024)
 - TransCAD (IDOT is paying for several licenses for MPOs to use)
- **Continuing to improve our travel demand model using a 2022 base year**



BLOOMINGTON-NORMAL
Metropolitan Long-Range
Transportation Plan 2050
MCLEAN COUNTY REGIONAL PLANNING COMMISSION | Approved October 28th, 2022



Transportation Improvement Program SFY 2025 - 2029

McLean County Regional Planning Commission
for the
Bloomington-Normal Urbanized Area
Approved June 28, 2024

Transportation
Improvement
Program

STATE FISCAL YEARS 2025-2029

As of the publication date of this draft, the Illinois Department of Transportation, District 5, has not yet identified projects in the Metropolitan Planning Area. State projects will be included in the FY 2025 - 2029 Transportation Improvement Program either through the public review process or through later amendment.

Questions?

Thomas Valencia

Assistant Planner

McLean County Regional Planning Commission (MCRPC)

E-Mail: tvalencia@mcplan.org

Office Phone: 309-434-6836