LTD's Greenhouse Gas Inventory Results FY12-18

Board of Directors Work Session - September 16, 2019

OVERVIEW

- Purpose of the study
- Historical context
- Results 1: GHG impacts from Transit
- Results 2: GHG benefits of Transit
- Next Steps
- Q&A

PURPOSE

- Understand how LTD's emissions fit into regional, state, local goals
- Understand implications for operational decisions
- Update 2007 sustainability policy (Resolution No. 2007-027)
- Set GHG reduction goals

HISTORICAL CONTEXT

- 2007 - LTD Sustainability Policy, State GHG reduction goals set
- 2014 – LTD APTA Sustainability Commitment - Silver
- 2015 - Central Lane Scenario Planning
- 2016 - Eugene CRO – 4 goals set
- 2018 – LTD Sustainability Program Manager position; Fleet Plan grant
- 2019 - Electric bus testing, MOD pilots

GHG BENEFITS AND IMPACTS FROM TRANSIT

Net Greenhouse Gas Impacts of Transit
Emissions Produced – Emissions Displaced

Emissions Produced by Transit

Transit Operations

- Fleet vehicles fuel use
- Electricity & natural gas from buildings and stations
- Refrigerants used in vehicle air conditioning
- All other emissions sources

Emissions Benefits of Transit

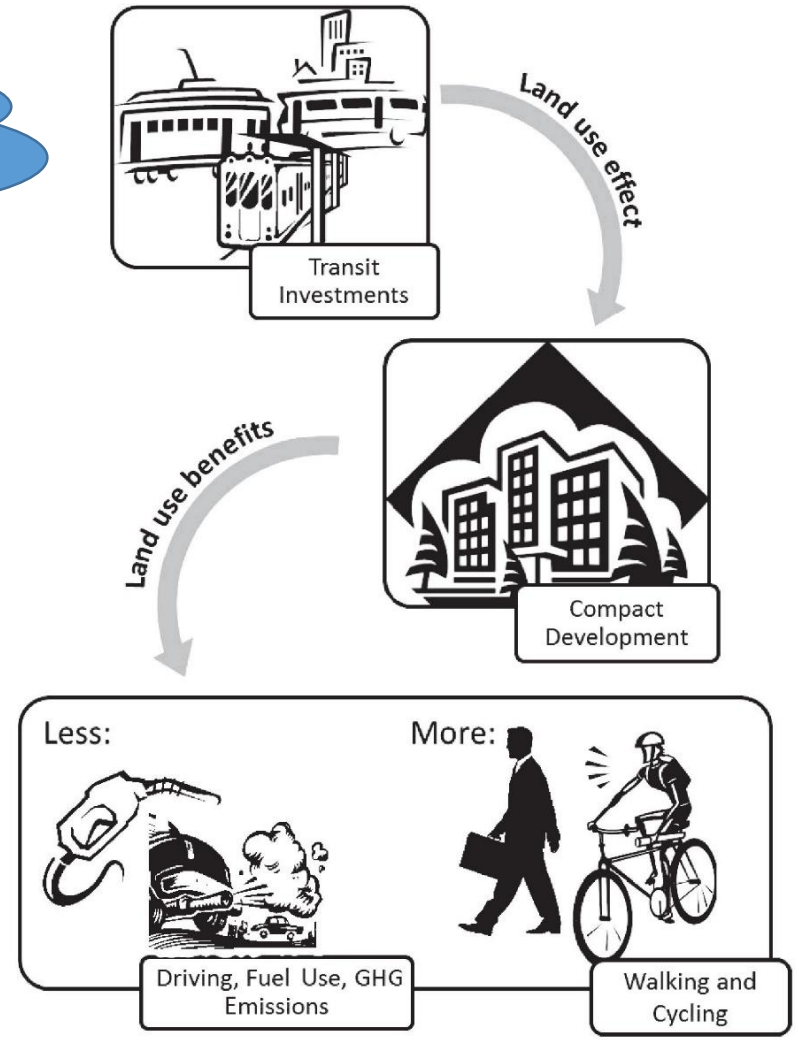
Ridership Benefit

- Reduced VMT from taking the bus instead of a private auto

Land Use Benefit

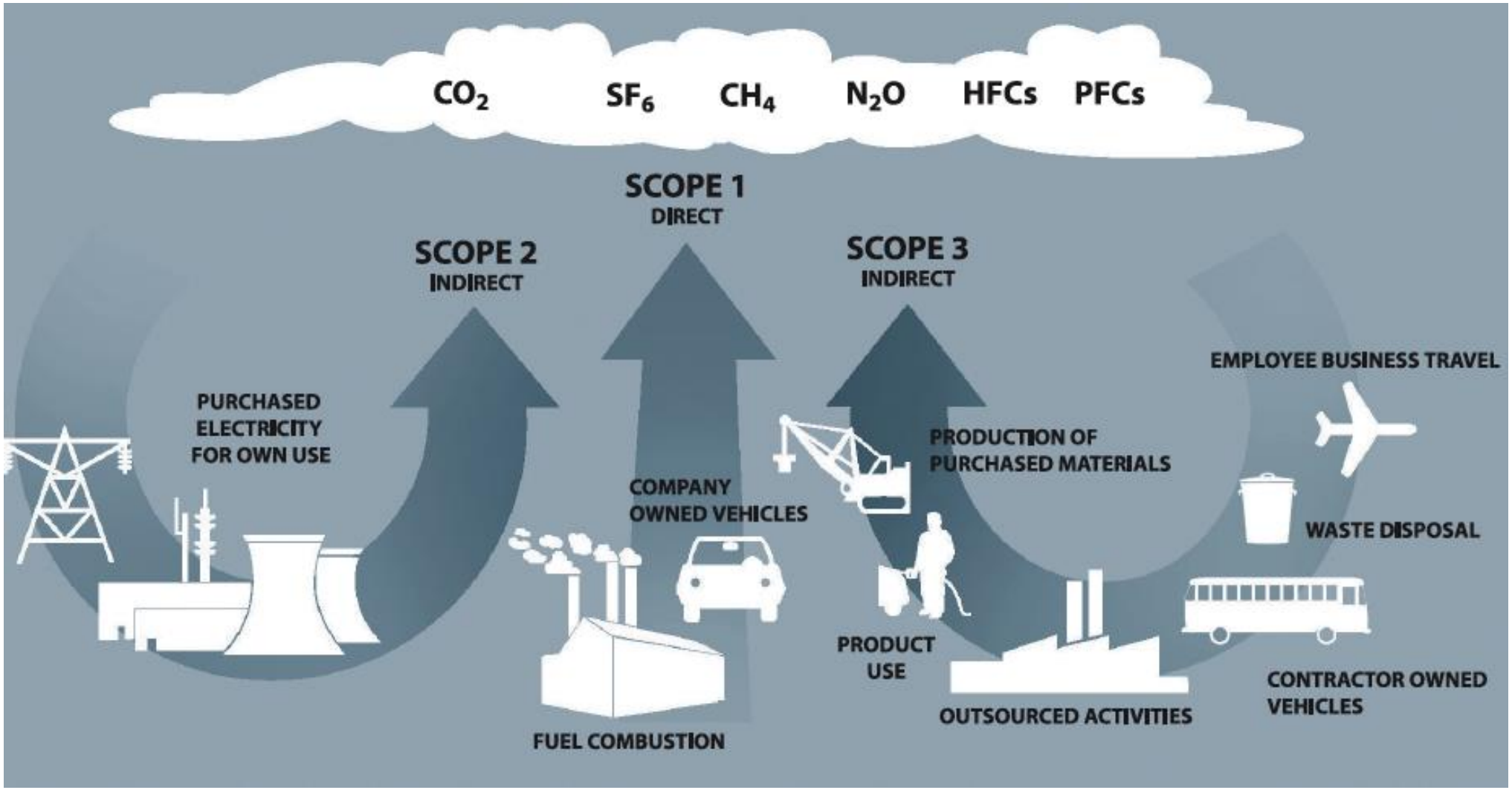
- Compact development around transit facilities reduces VMT for all
- Shorter trips makes biking/walking more attractive

Graphic Adapted from *Quantifying Greenhouse Gas Emissions from Transit,* APTA, 2009.



Graphic from TCRP 176 *GHG Benefits from Transit* User guide, 2015.

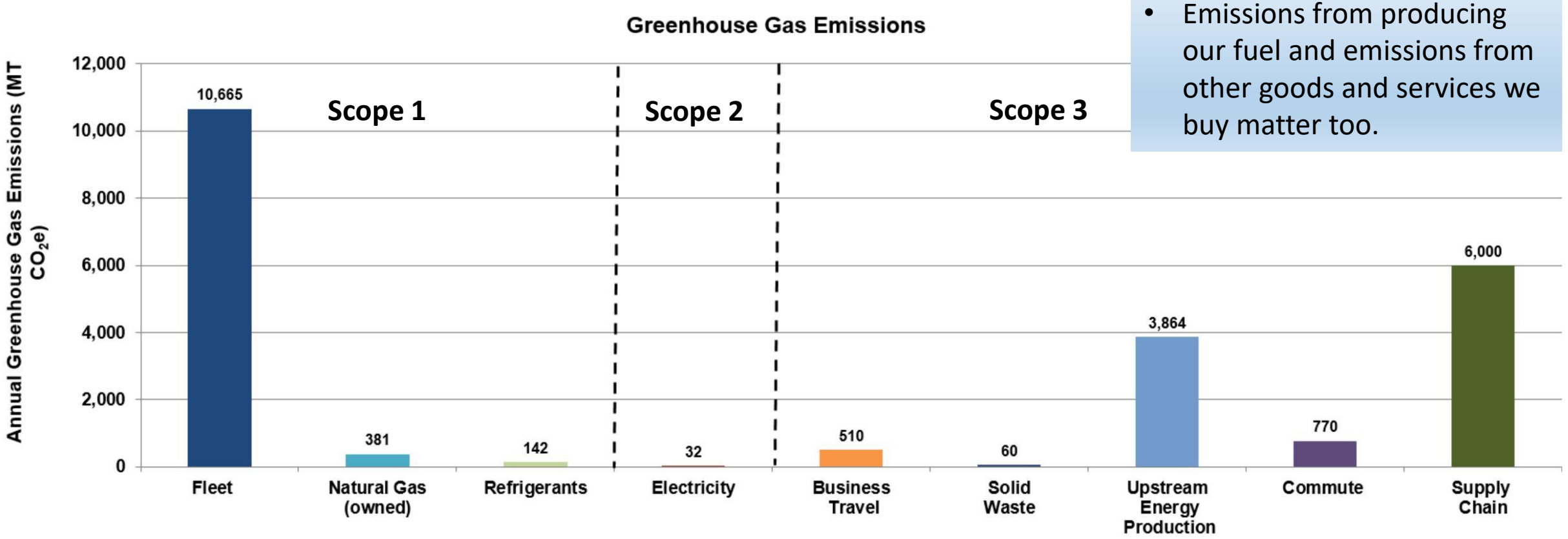
GHG ACCOUNTING – 3 SCOPES



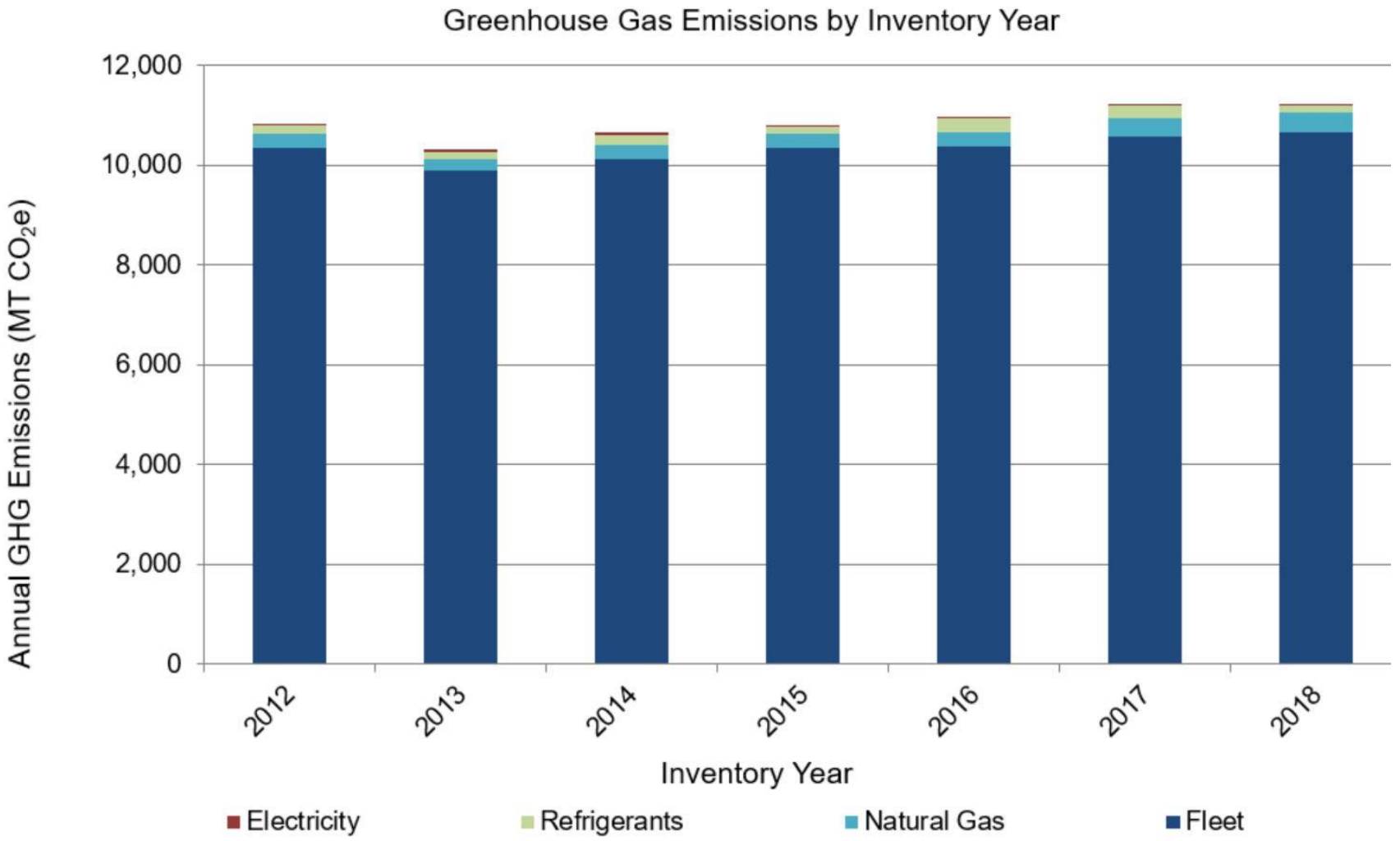
GHG EMISSIONS FROM TRANSIT FY 2018

KEY LESSONS:

- Fleet matters most!
- Emissions from producing our fuel and emissions from other goods and services we buy matter too.



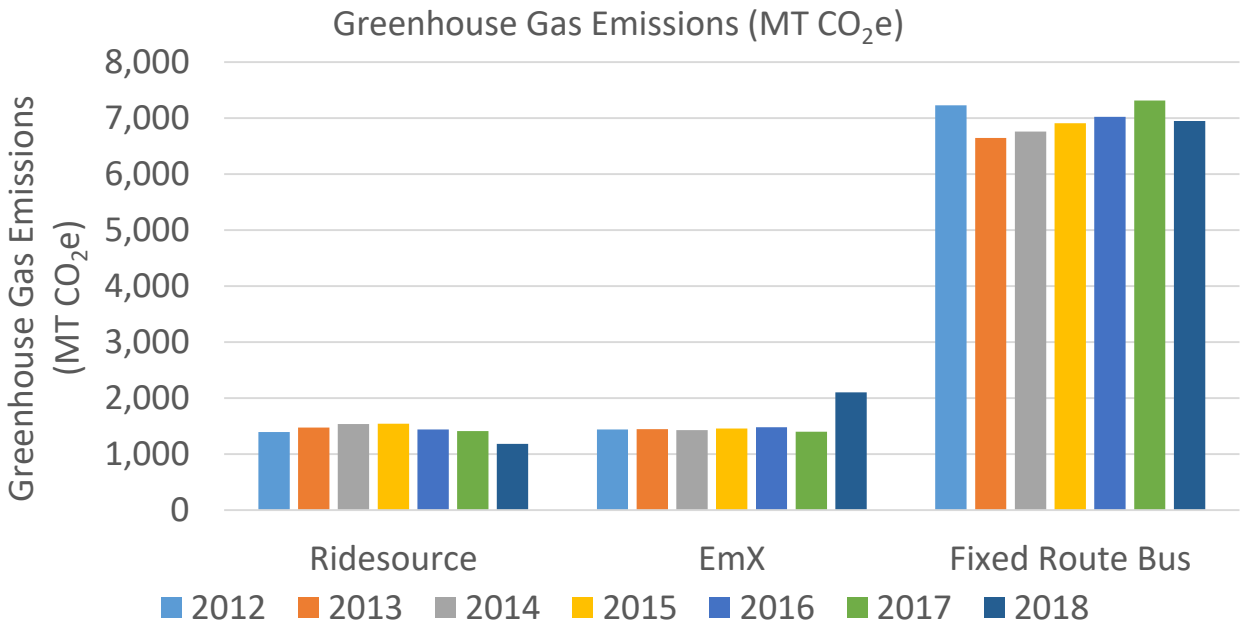
SCOPE 1 & 2 EMISSIONS - FY12-18



KEY LESSONS:

- Aggregate Fleet emissions have been fairly consistent over time.
- Fleet emissions represent 94%+ of emissions LTD has full control over.

FLEET EMISSIONS BY SERVICE TYPE

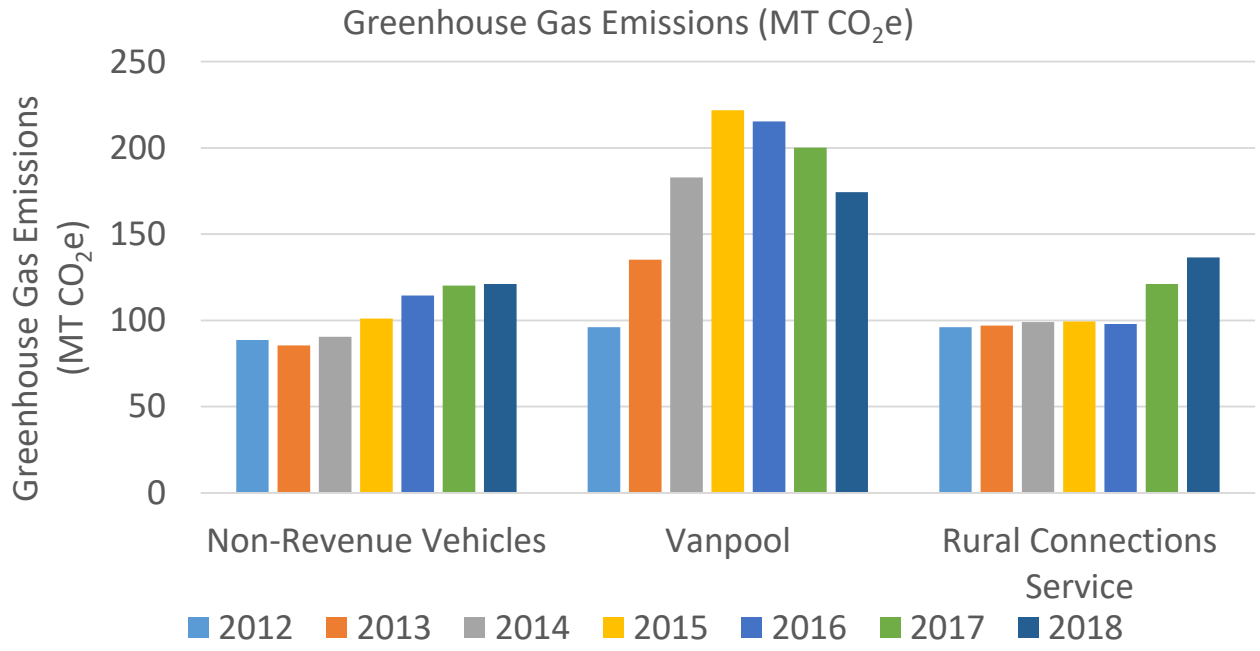


KEY LESSONS:

- Fixed route is largest share of total emissions
- EmX and Ridesource emissions are similar in scale
- 2018 EmX increase from EmX West opening
- Fixed Route efficiency gains between '12-'13; reduced vehicle miles and minor efficiency gains in '18.

KEY LESSONS:

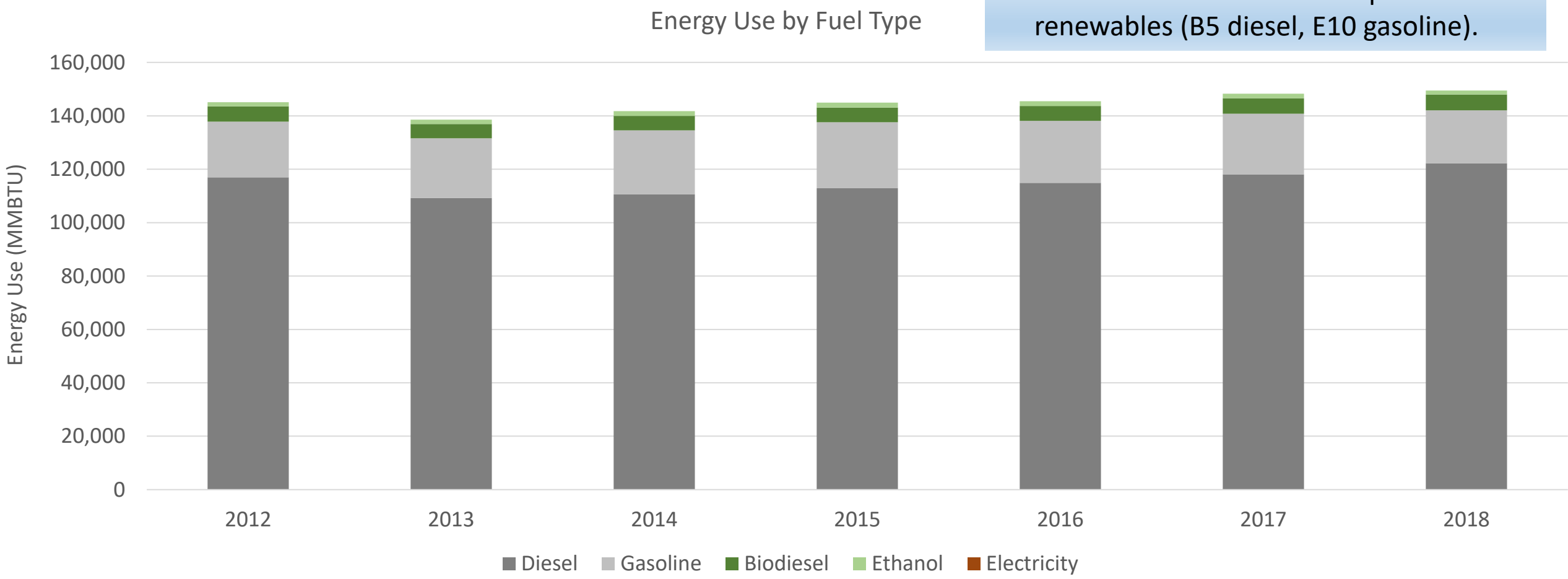
- Note difference in scale between two charts
- Non-Revenue vehicle increase from increased staff/miles
- Vanpool changes due to demand
- Rural Connections: added Rhody Express and Florence-Yachats reporting to this category in '18.



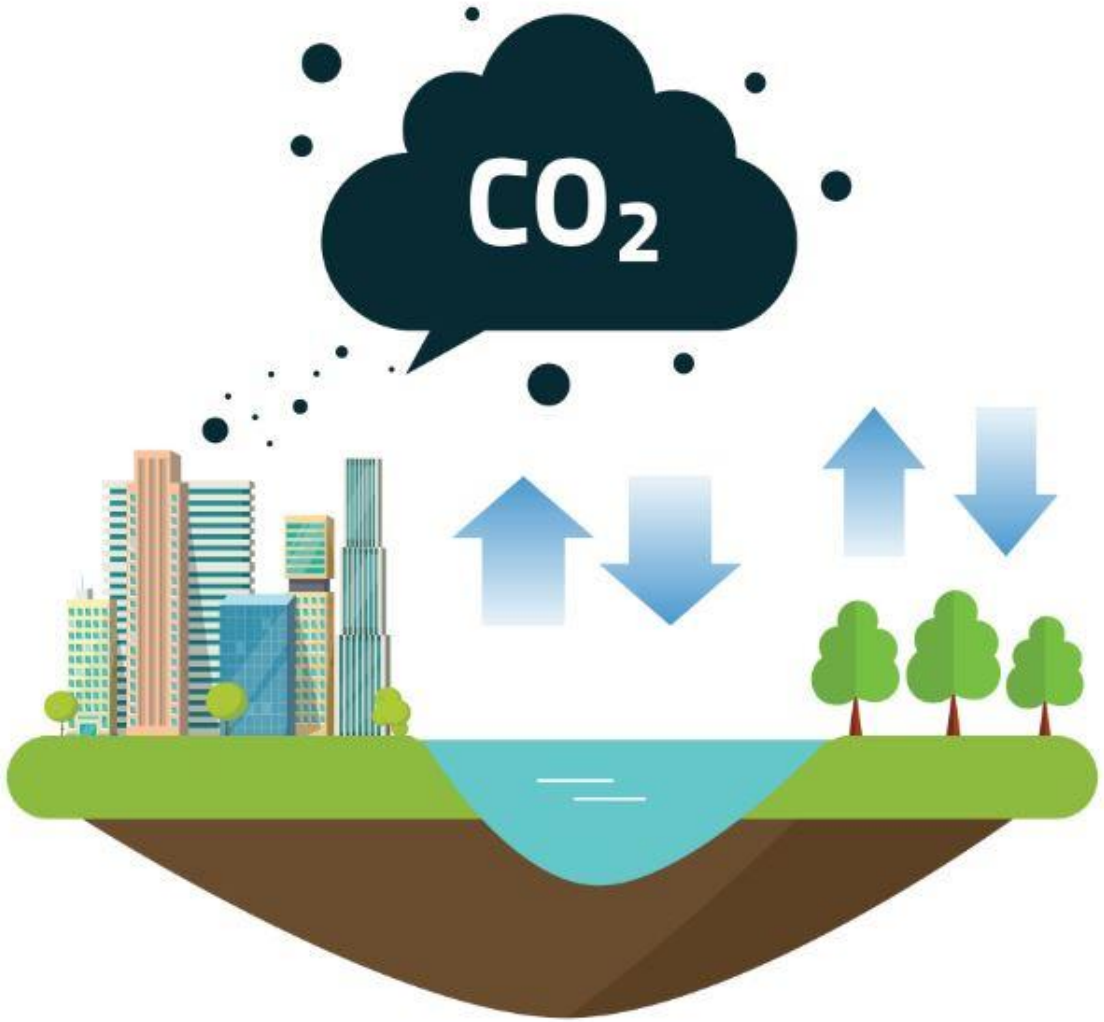
FLEET ENERGY CONSUMPTION BY FUEL TYPE

KEY LESSON:

- 5% of LTD fleet fuel consumption is from renewables (B5 diesel, E10 gasoline).

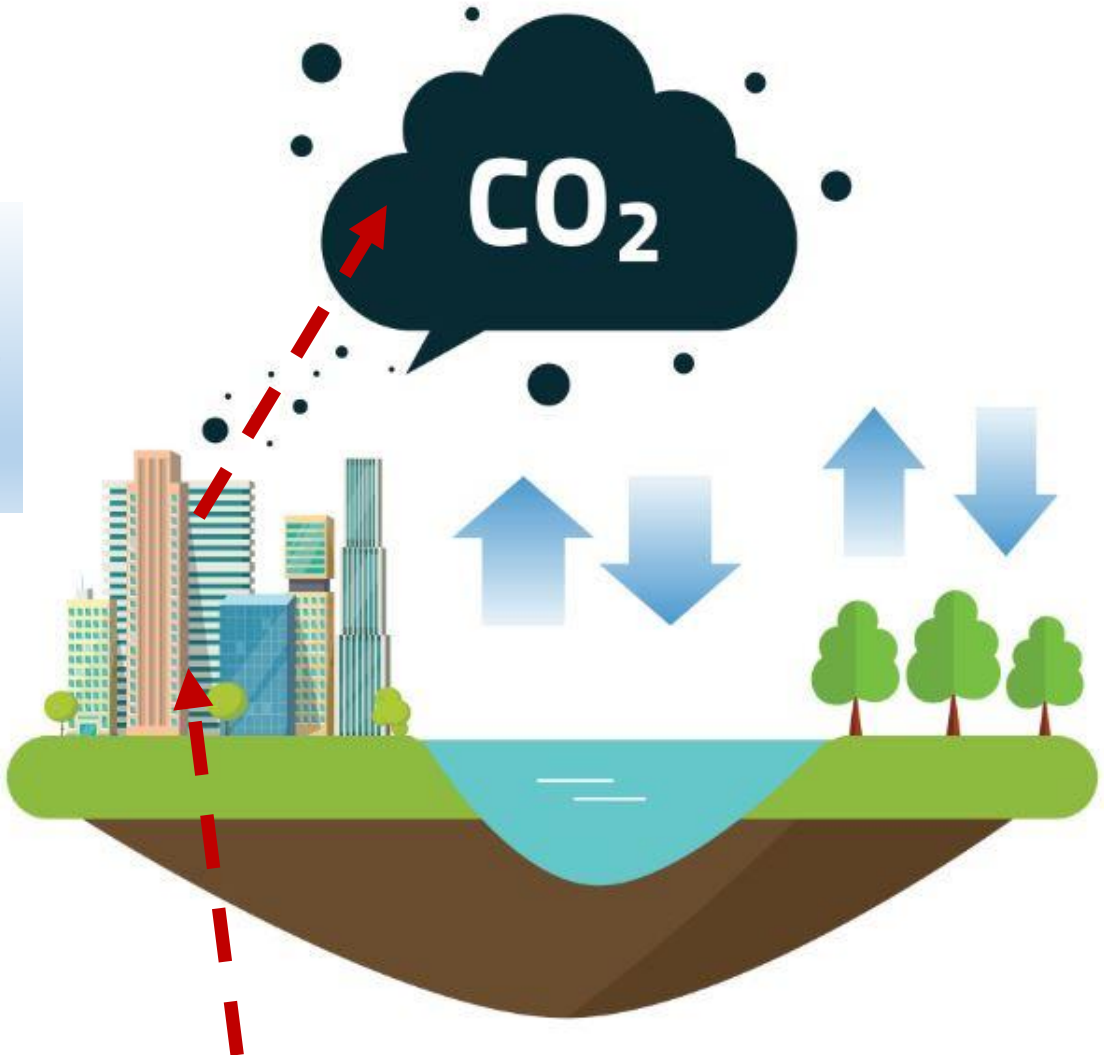


THE CARBON CYCLE



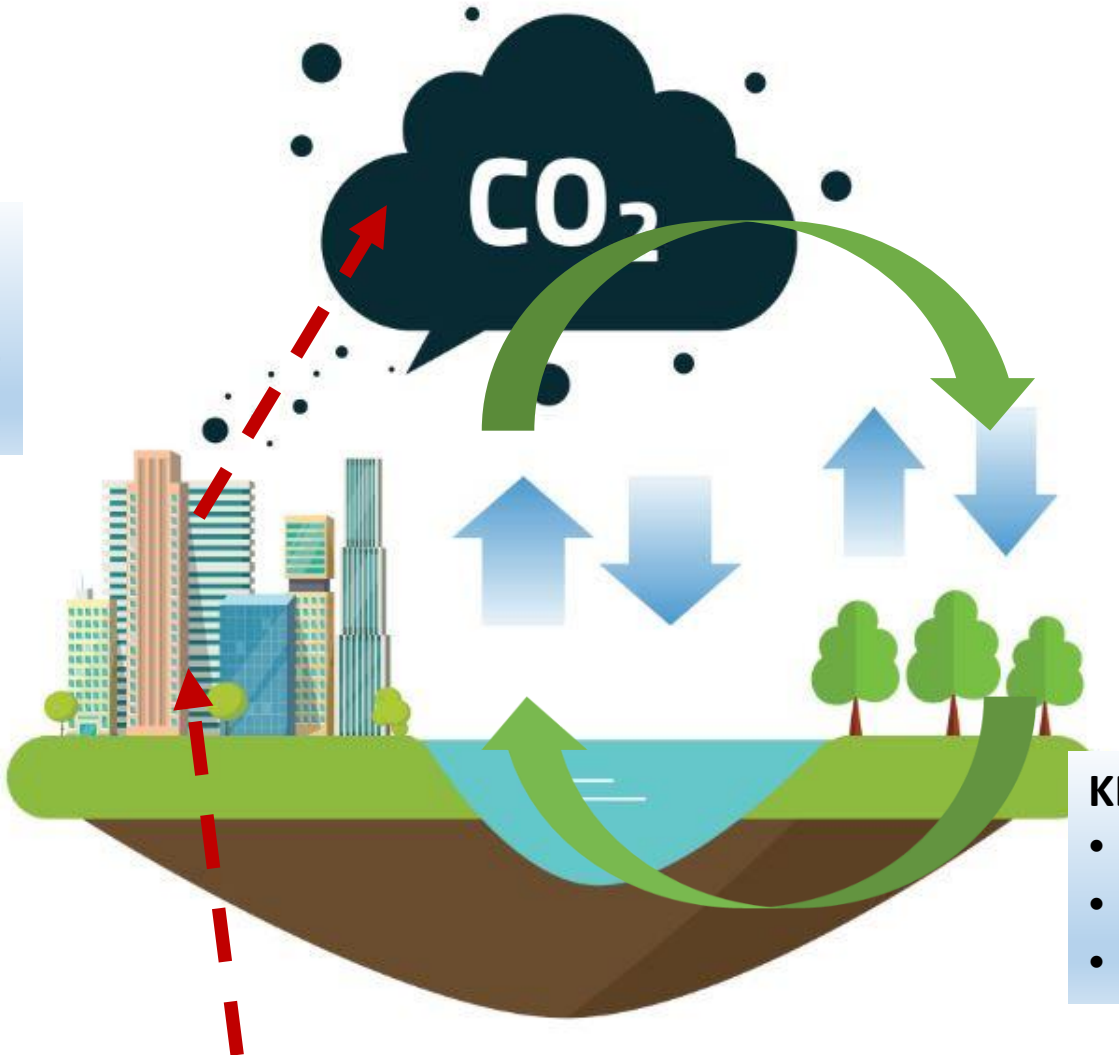
ANTHROPOGENIC EMISSIONS

Anthropogenic emissions: come from mining fossil fuels previously sequestered in the Earth's crust or significant land use changes.



ANTHROPOGENIC vs. BIOGENIC EMISSIONS

Anthropogenic emissions: come from mining fossil fuels previously sequestered in the Earth's crust.



Biogenic emissions: considered part of the natural carbon cycle.

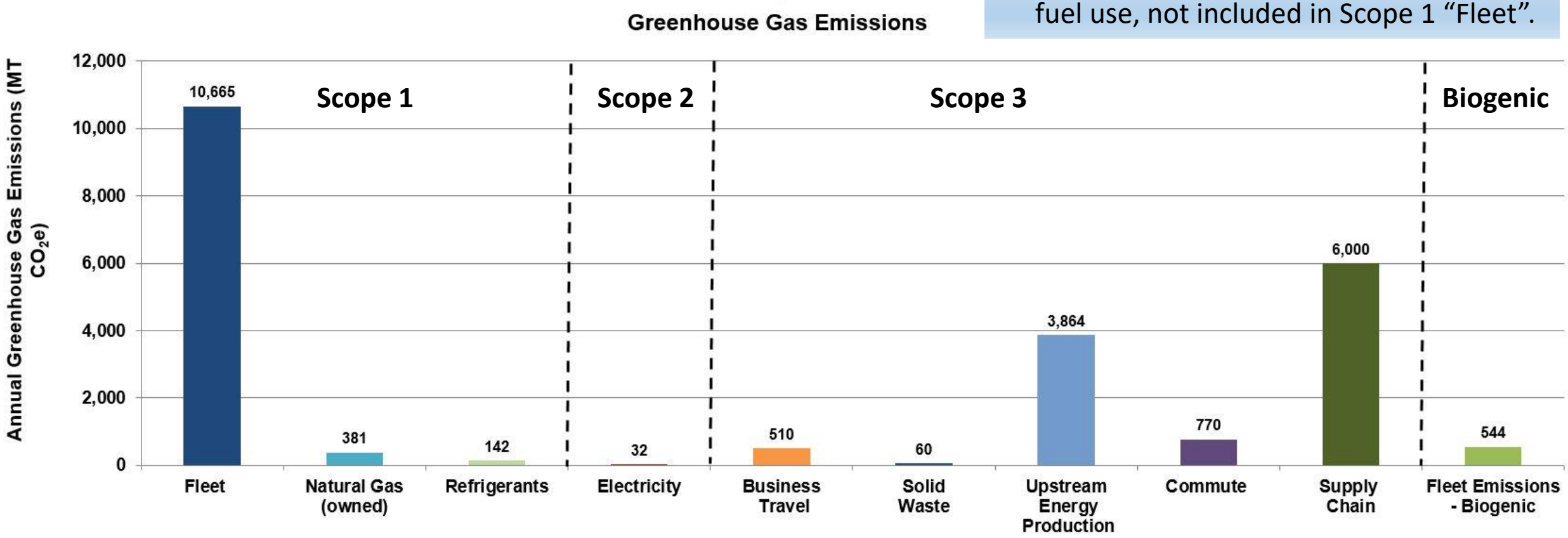
KEY LESSON:

- Not all emissions are created equal.
- Anthropogenic ≠ biogenic
- Fossil fuels ≠ renewable fuels

FY 2018 EMISSIONS, INCLUDING BIOGENIC

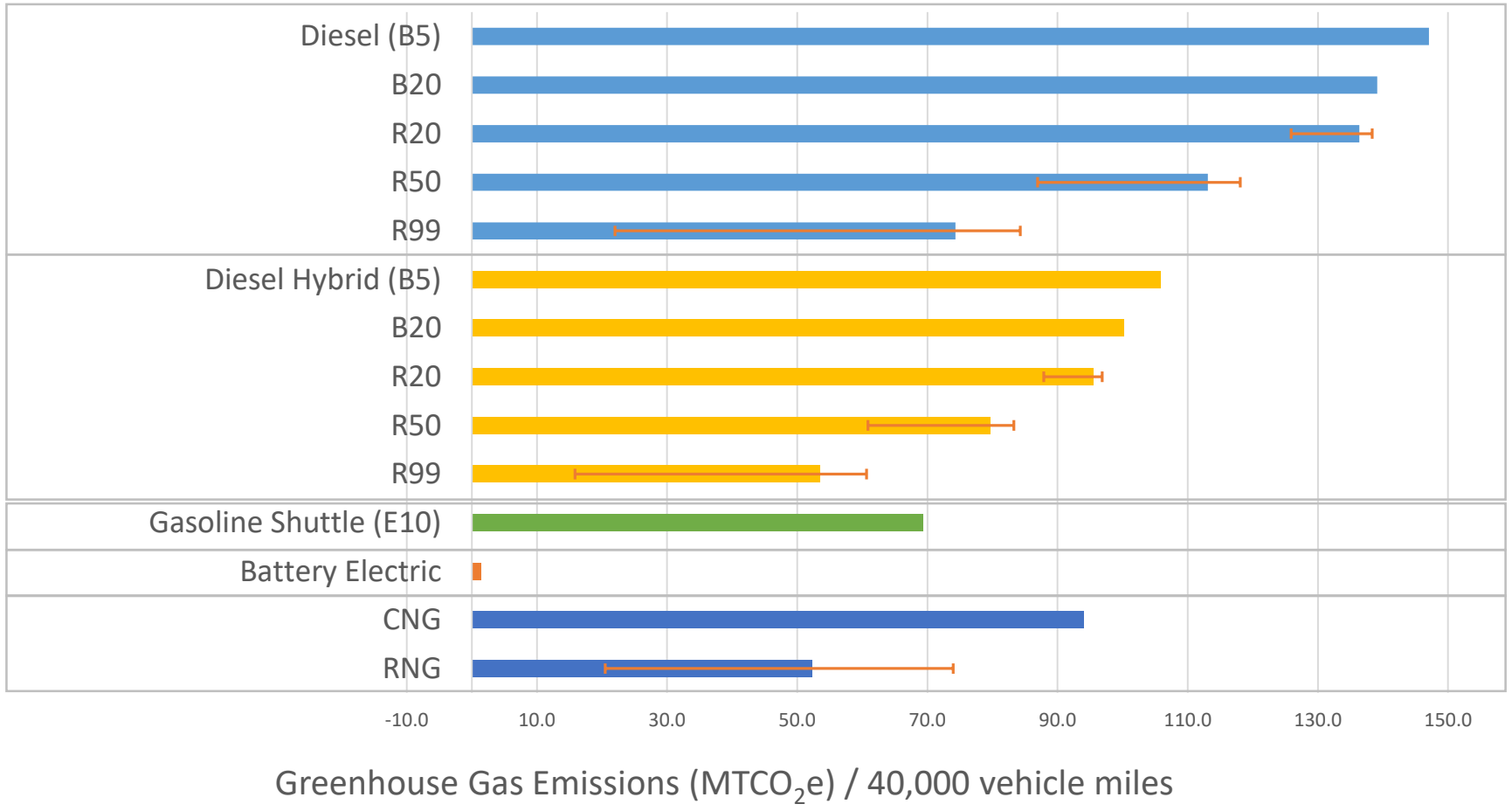
KEY LESSON:

- LTD's Biogenic emissions from renewable fuel use, not included in Scope 1 "Fleet".



LIFECYCLE EMISSIONS BY FUEL TYPES

GHGs by Fuel Type for 40,000 miles of travel
(with error bars for range of carbon scores)

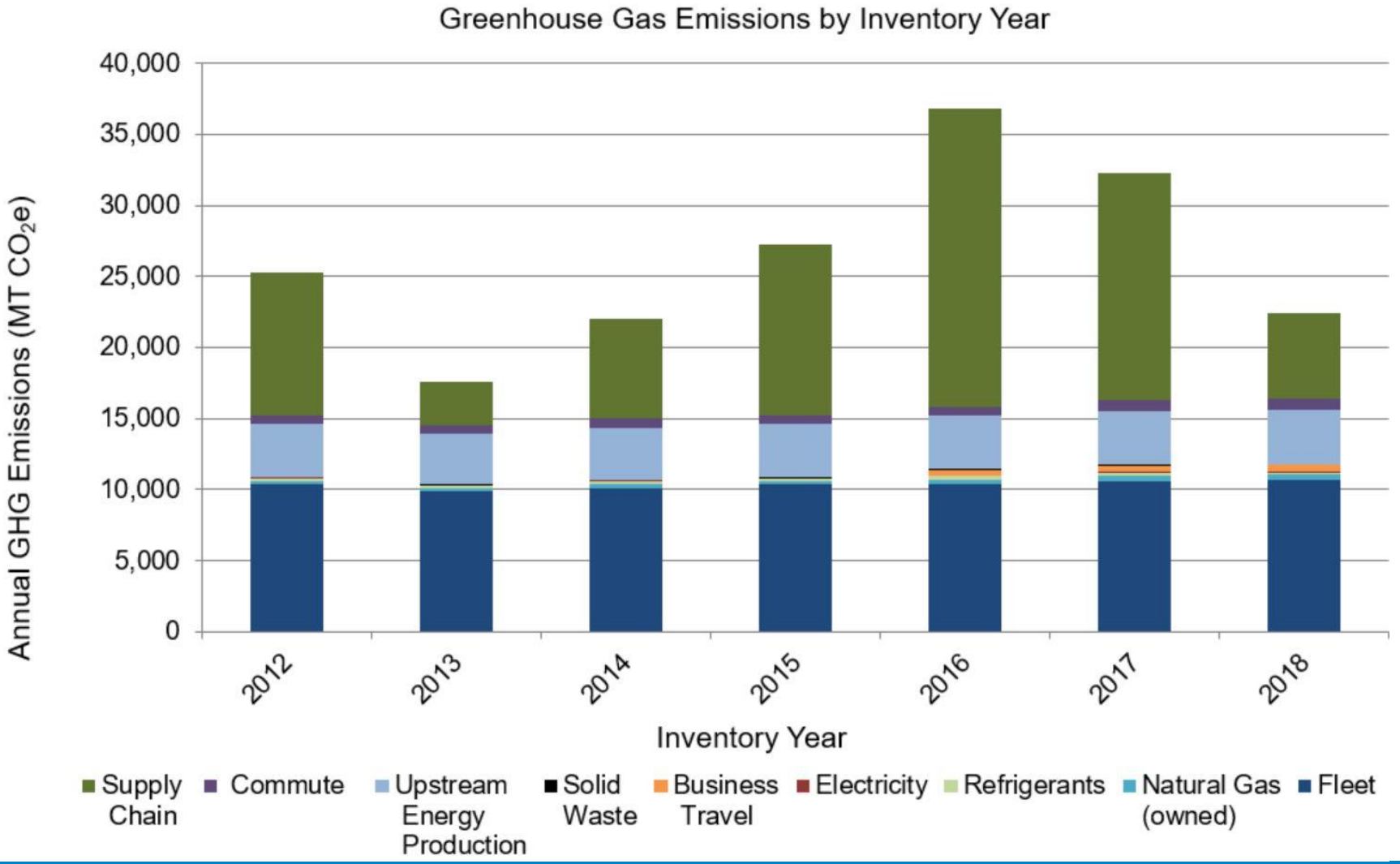


Greenhouse Gas Emissions ($MTCO_2e$) / 40,000 vehicle miles

KEY LESSONS:

- Opportunity abounds to reduce fleet emissions.
- LTD will study the opportunities in detail in 2020 for long-term fleet plan.

ADDING IN SCOPE 3 EMISSIONS - FY12-18



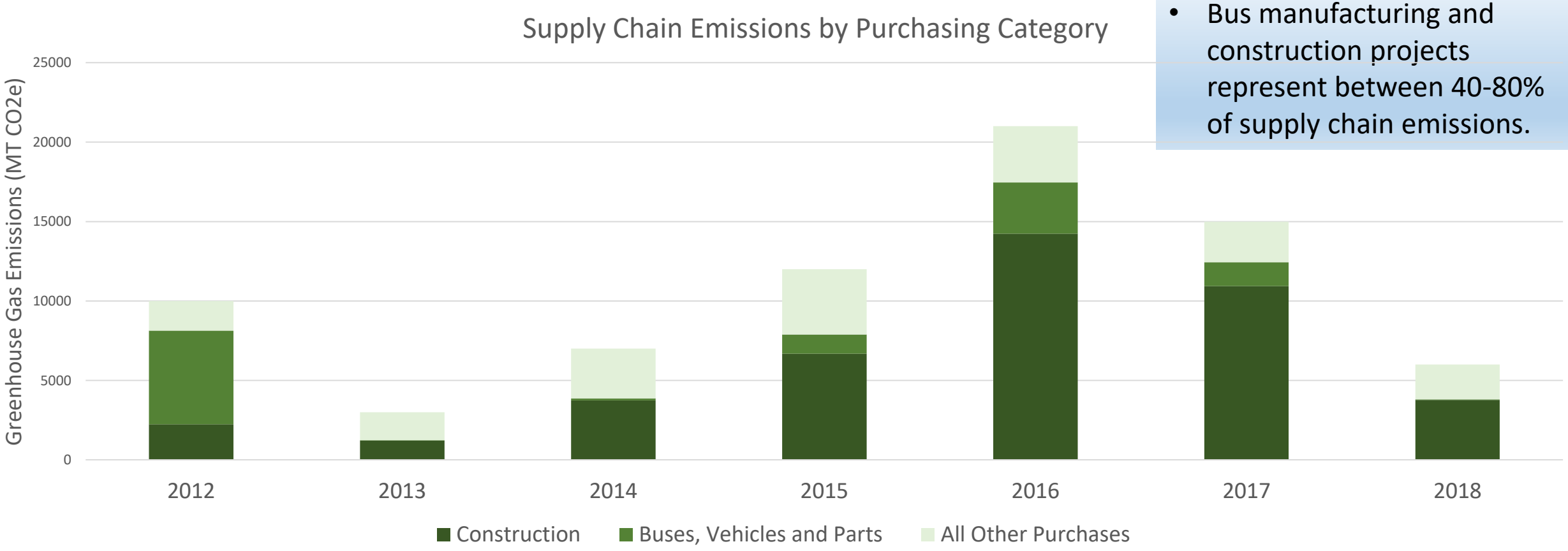
KEY LESSON:

- Supply chain emissions vary with expenditure on major projects.

SUPPLY CHAIN EMISSIONS DETAIL - FY12-18

KEY LESSON:

- Bus manufacturing and construction projects represent between 40-80% of supply chain emissions.



GHG BENEFITS AND IMPACTS FROM TRANSIT

Net Greenhouse Gas Impacts of Transit
Emissions Produced – Emissions Displaced

Emissions Produced by Transit

Transit Operations

- Fleet vehicles fuel use
- Electricity & natural gas from buildings and stations
- Refrigerants used in vehicle air conditioning
- All other emissions sources

Emissions Benefits of Transit

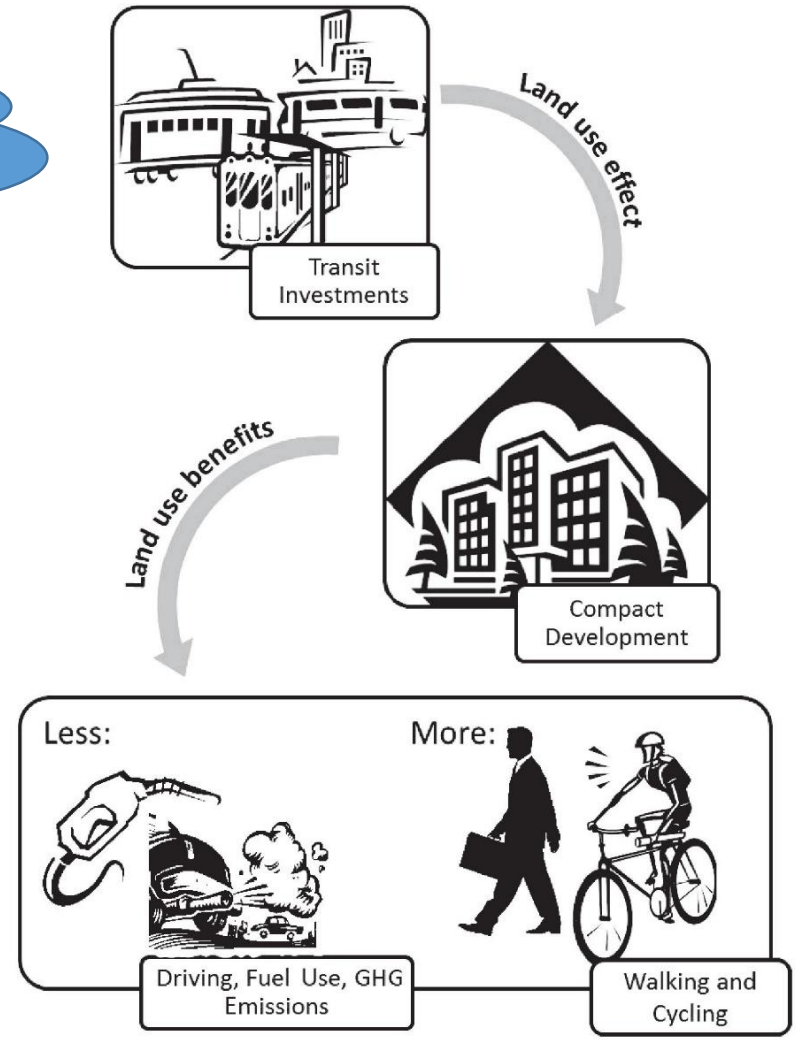
Ridership Benefit

- Reduced VMT from taking the bus instead of a private auto

Land Use Benefit

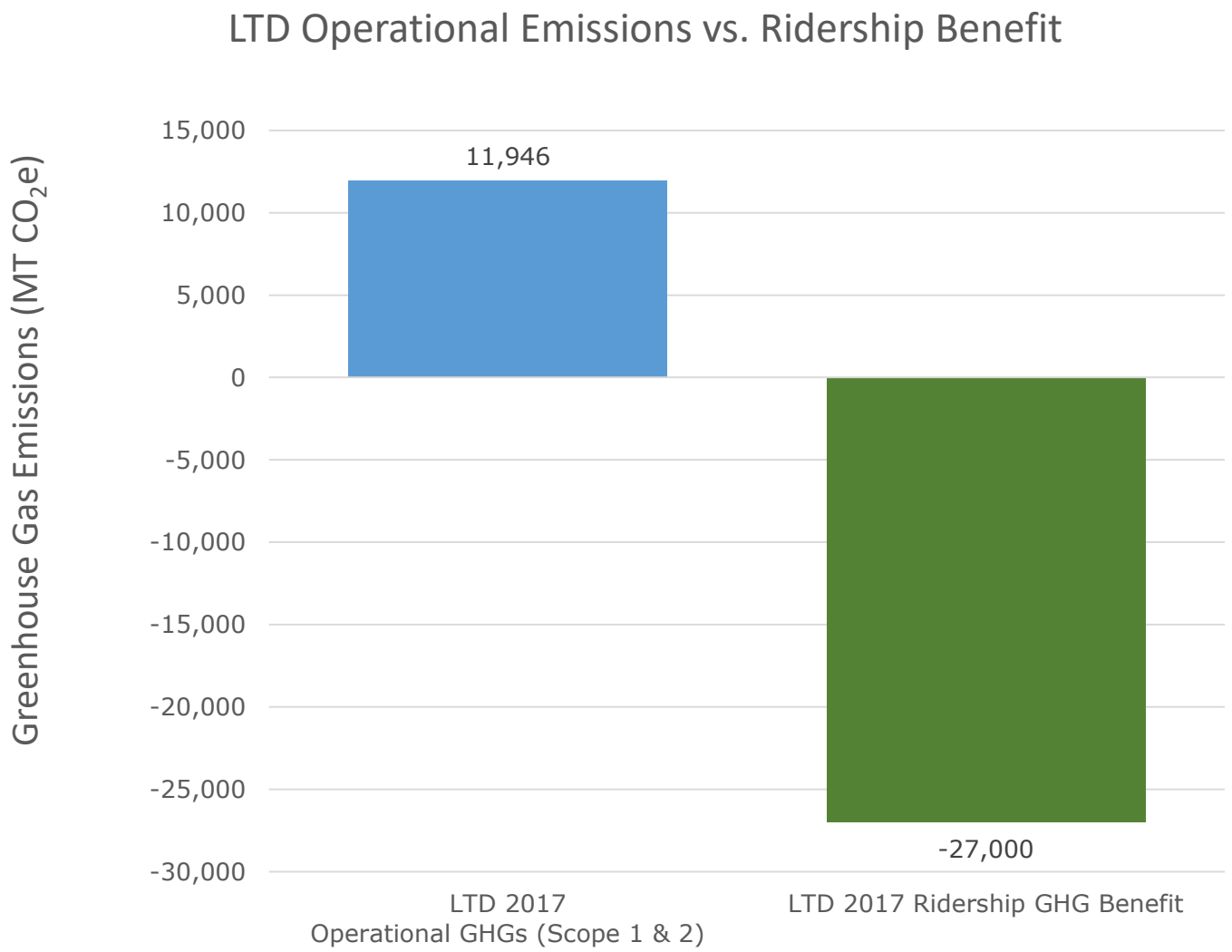
- Compact development around transit facilities reduces VMT for all
- Shorter trips makes biking/walking more attractive

Graphic Adapted from *Quantifying Greenhouse Gas Emissions from Transit,* APTA, 2009.



Graphic from TCRP 176 *GHG Benefits from Transit* User guide, 2015.

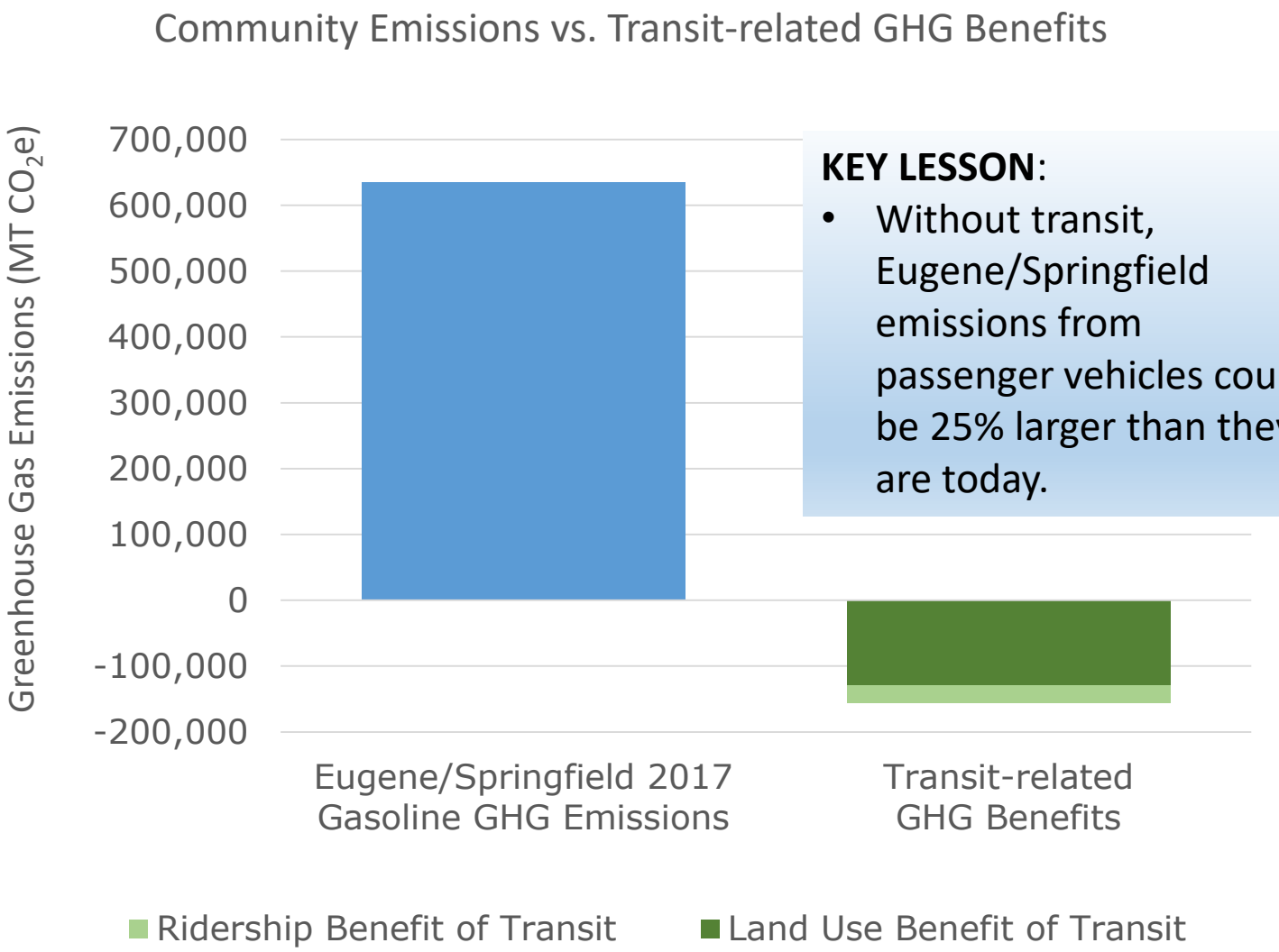
GHG BENEFITS OF RIDERSHIP



KEY LESSONS:

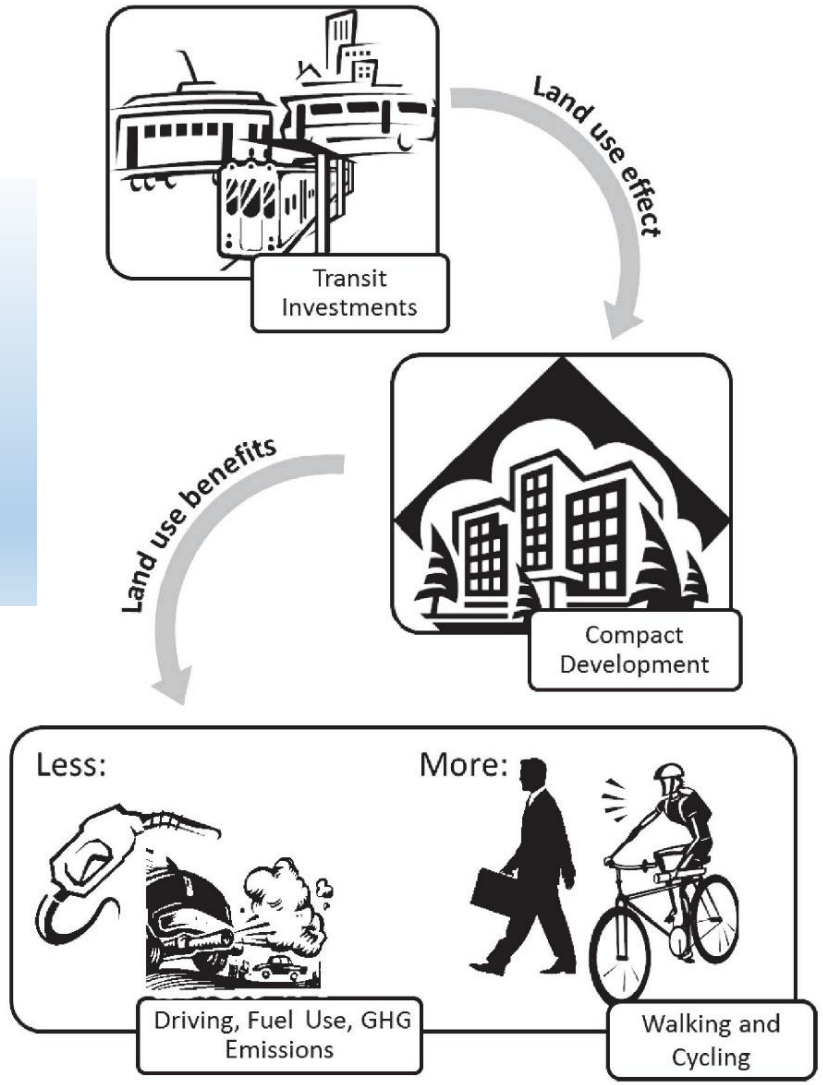
- **Ridership benefits from transit are more than 2x the emissions from transit operations.**
- **Public transit is an important strategy to reduce community emissions.**

GHG BENEFITS OF LAND USE EFFECT



KEY LESSON:

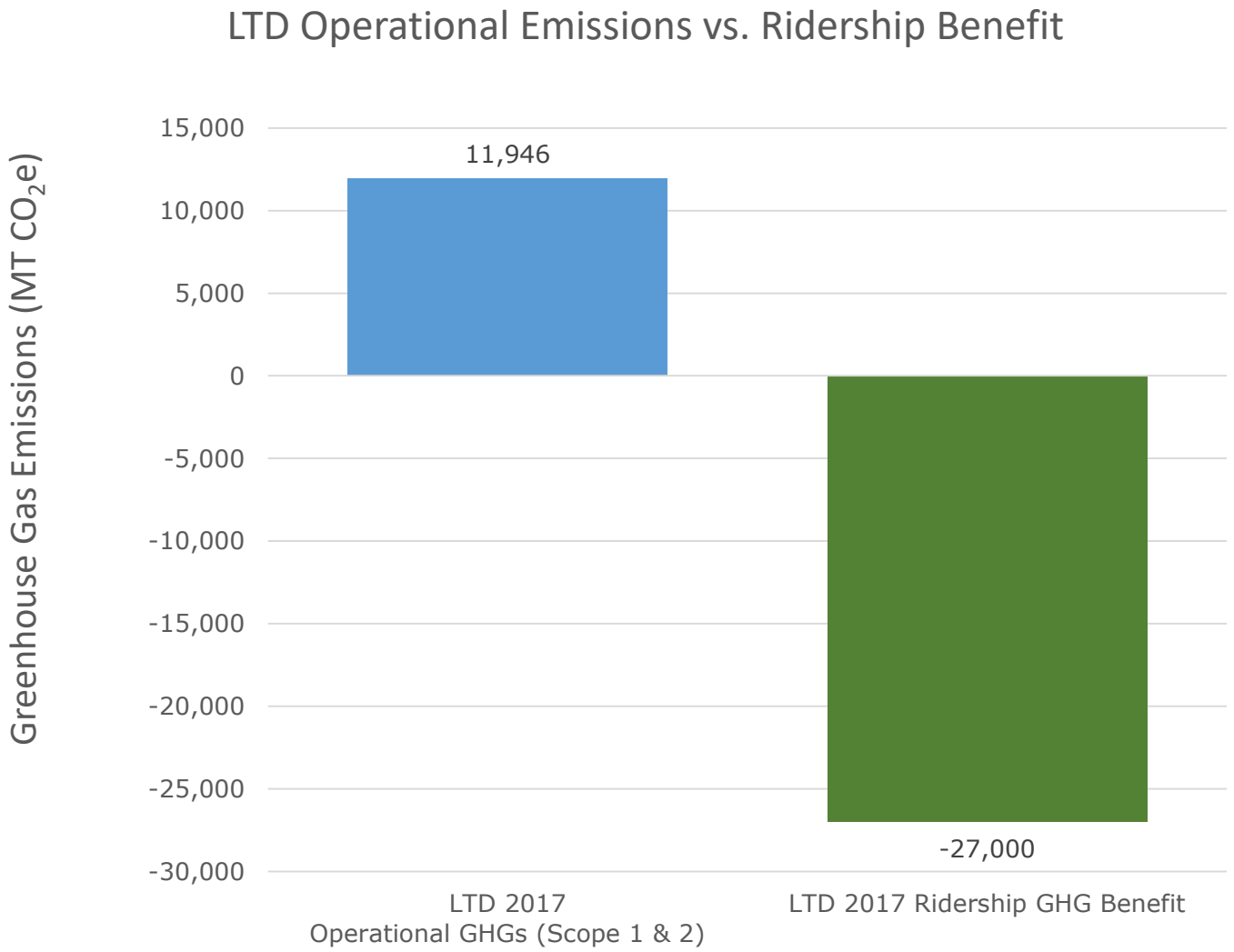
- Without transit, Eugene/Springfield emissions from passenger vehicles could be 25% larger than they are today.



NEXT STEPS

- Electric bus procurement, WA State Contract
- Technology / Fuel analysis for Fleet Plan
- GHG reduction modeling for goal setting
- Sustainability policy update

1. GET PEOPLE ON THE BUS



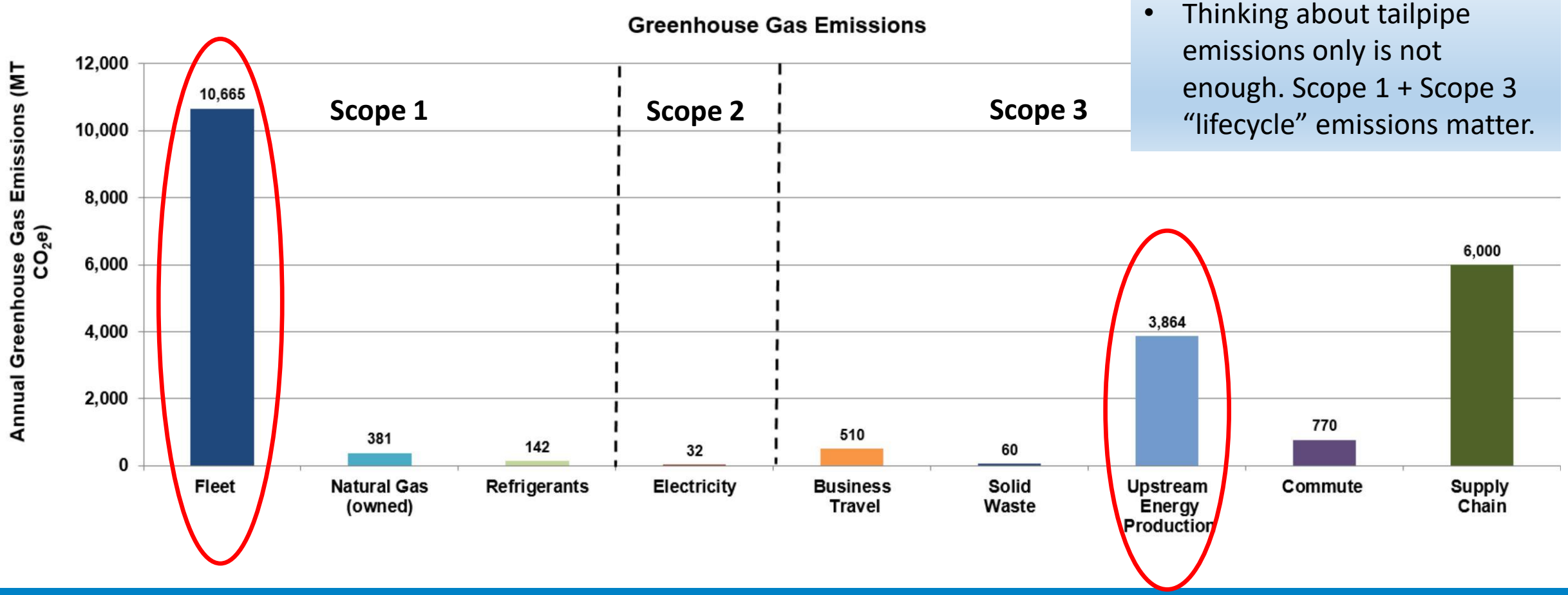
KEY LESSONS:

- **Ridership benefits from transit are more than 2x the emissions from transit operations.**
- **Public transit is an important strategy to reduce community emissions.**

2. FOCUS ON FLEET; THINK LIFECYCLE…

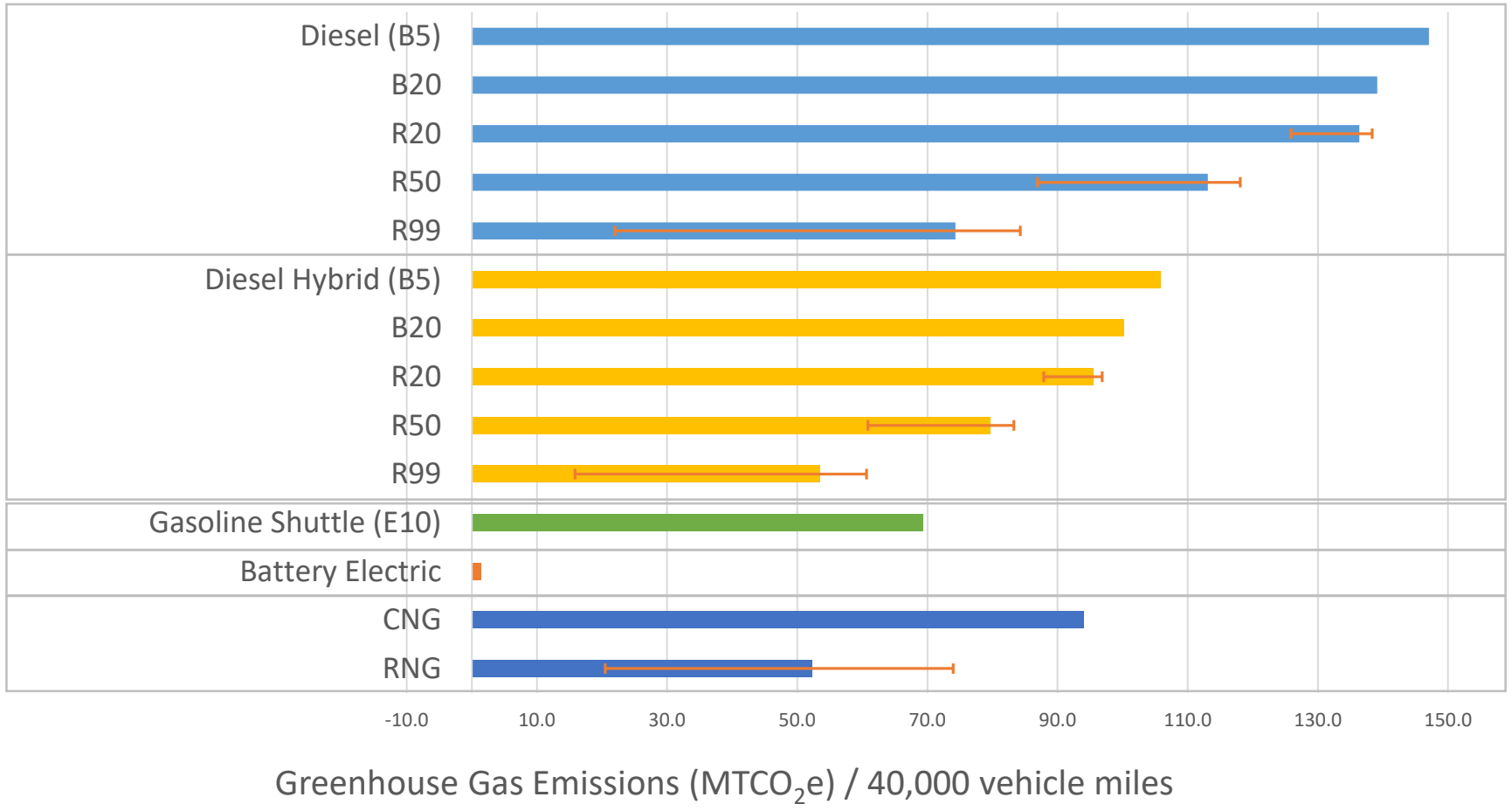
KEY LESSONS:

- Fleet matters most!
- Thinking about tailpipe emissions only is not enough. Scope 1 + Scope 3 "lifecycle" emissions matter.



3. EMISSIONS REDUCTIONS ARE POSSIBLE

Lifecycle GHGs by Fuel Type for 40,000 miles of travel
(with error bars for range of carbon scores)

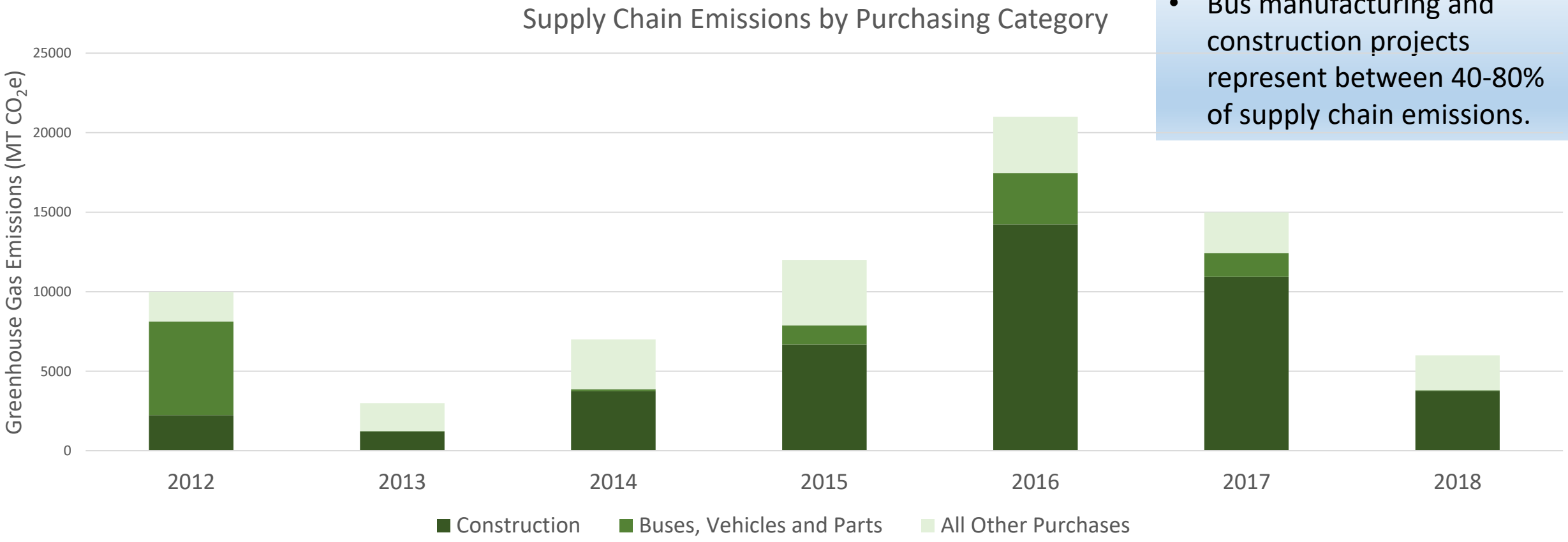


Greenhouse Gas Emissions ($MTCO_2e$) / 40,000 vehicle miles

KEY LESSONS:

- Opportunity abounds to reduce fleet emissions.
- LTD will study the opportunities in detail in 2020 for long-term fleet plan.

4. SEEK LOW CO_2 CONSTRUCTION MATERIALS



KEY LESSON:

- Bus manufacturing and construction projects represent between 40-80% of supply chain emissions.

Q&A? Thank you!

Kelly Hoell
Sustainability Program Manager
541-682-6146
Kelly.hoell@ltd.org