EXECUTIVE SUMMARY

This report presents a community greenhouse gas emissions (GHG) inventory for Fairfax County, Virginia. These emissions come from both stationary and mobile sources, as a result of commercial, residential, industrial, local government and transportation activities within the jurisdictional boundaries of the county. The inventory establishes 2006 as its baseline year. It then tracks annual emissions for the five-year period from 2006 through 2010.

During the study, there were no nationally recognized guidelines for undertaking a community GHG emissions inventory. Consequently, the county developed its own methodology based on protocols established by the Climate Registry, similar to the approach undertaken by adjacent Arlington County, Virginia.

The Fairfax County GHG inventory includes both direct (Scope 1) emissions generated within the county and energy-related indirect (Scope 2) emissions. Scope 2 emissions result from purchased electricity that is consumed inside the county, regardless of where it was generated.

Greenhouse gases considered include carbon dioxide, methane and nitrous oxide. These three chemicals, all related to energy production and consumption, together made up more than 98% of United States' GHG emissions in 2006 (3). Other emissions were deemed either outside the county's political jurisdiction, insignificant and/or infeasible to accurately measure across sectors at the county scale. Data to calculate emissions were provided by federal and commonwealth agencies, the Metropolitan Washington Council of Governments (MWCOG), public utilities providing service in Fairfax County and Fairfax County Government.

The county's total GHG inventory is composed of the sum of energy-related GHG emissions from stationary and mobile sources. Stationary sources encompass buildings or other fixed, energy-consuming property not attributable to federal or state governments. Stationary energy use includes electricity, natural gas and a tiny amount of fuel oil. Mobile emissions include those associated with on-road traffic originating in and passing through the county, as well as light rail, off-road vehicles and mobile machinery (e.g., lawnmowers). Mobile sources predominantly use gasoline or diesel fuel.

Figure ES-1 and Figure ES-2 present the distribution of 2006 emissions across various stationary and mobile sources, respectively. Stationary sources accounted for 63% of the county's total GHG emissions, primarily from electricity use. As shown in Figure ES-1, residential and commercial sectors each comprised about 46% of stationary

emissions. Local government (including public schools) and industry comprised about 5% and 3%, respectively.

Mobile sources accounted for 37% of total GHG emissions in the county. About 89% of mobile emissions came from on-road vehicles. As shown in Figure ES-2, of this 89%, 46% was attributable to vehicles passing through the county (transient vehicles) and 43% to vehicles registered in the county (local vehicles). Off-road vehicles and machinery comprised 10% of mobile emissions. Together, Metrorail and Virginia Railway Express (VRE) trains accounted for approximately 1% of mobile emissions.

Figure ES-1: Distribution of 2006 GHG emissions from stationary units

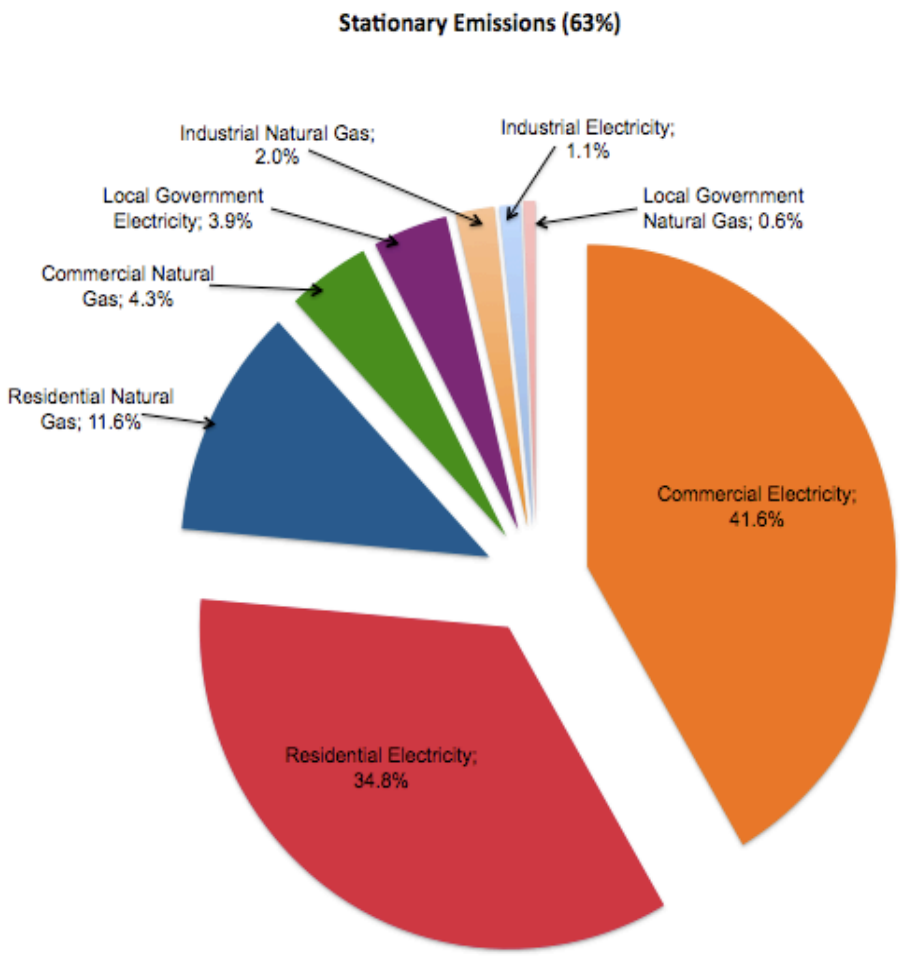

Figure ES-2: Distribution of 2006 GHG emissions from mobile units

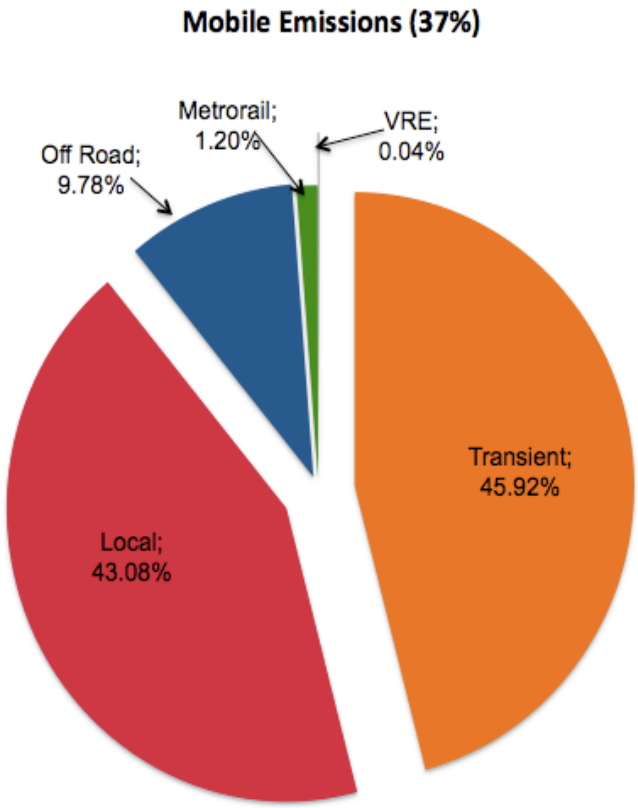

Table ES-1 displays 2006 emissions by sector and source. Total energy-related GHG emissions in 2006 were 11.83 million metric tons of carbon dioxide equivalent (Million MTCO2e), or about 11.41 $MTCO_2e$ per county resident.

As shown in Table ES-1, the majority of stationary emissions were from the residential and commercial sectors, each of which contributed 29% of total emissions. The majority of mobile emissions were from on-road vehicles. Passenger vehicles and motorcycles contributed 24% of total emissions.

Table ES-1: Fairfax County 2006 GHG emissions by source and sector[1]

Emissions Sector and Source	Million MTCO2e* in 2006	2006 Emissions (%)
Stationary Sources		
Residential	3.459	29%
Commercial	3.420	29%
Local government	0.339	3%
Industrial	0.233	2%
Subtotal	**7.450**	**63%**
Mobile Sources		
Passenger vehicles	2.822	24%
Heavy trucks	0.596	5%
Light trucks	0.486	4%
Other	0.484	4%
Subtotal	**4.388**	***37%***
TOTAL	**11.838**	**100%**

From 2006 to 2010, yearly GHG emissions rose by 3%, as shown in Table ES-2. Since population grew more than 4% over this period, emissions per resident declined by 1%. This decline resulted from notable drops in commercial (-5%) and industrial (-19%) emissions, countered by slight increases in residential (+3%) and local government (+1%) emissions per resident. By contrast, mobile GHG emissions per resident were constant.

Table ES-2: Year-to-year change in GHG emissions from 2006 to 2010

	2006	2007	2008	2009	2010
Million MTCO2e -- Change vs. 2006	11.838 --	12.211 +3%	12.097 +2%	11.978 +1%	12.217 +3%
$MTCO_2e$ per resident -- Change vs. 2006	11.41 --	11.72 +3%	11.57 +1%	11.39 -0%	11.30 -1%

This report includes three appendices. Appendix A provides a list of abbreviations. Appendix B describes methods and calculations. Appendix C details energy use and GHG emissions results by sector and year.

[1] Due to rounding, figures may not sum to subtotals or totals.