FLORIDA TRENDS IN TRANSPORTATION AND AIR QUALITY

PROBLEM STATEMENT

Trends and conditions reports have been a part of the Florida Department of Transportation's (FDOT's) planning process for many years. The Department has used these reports to aid policy and planning decision-making, including their use for the state transportation improvement plan (STIP). Historically, the FDOT has focused the trends and conditions analysis on those traditional elements of the transportation system that are directly associated with transportation impacts, particularly demand (i.e., population growth, location, transportation modes, economic growth) and supply (i.e., infrastructure, growth in lane miles built, transit service, number and capacity of seaports and airports). However, federal mandates have more recently directed state DOTs to consider the impacts of transportation on other state systems in their planning process, including the environment and land uses.

An important negative effect of transportation on the environment is the emission of air pollutants. According to the U.S. Environmental Protection Agency, transportation is responsible for 93 percent of all carbon monoxide (CO) emissions, 52 percent of all nitrogen oxides (NO_x) emissions, and 90 percent of all hydrocarbon (HC) emissions. These pollutants are regulated under the Clean Air Act and non-compliance with ambient air quality standards can have significant consequences for the construction of new roads.

OBJECTIVES

The objective of this research is to clarify the role of transportation in the occurrence of air quality problems in Florida and to identify potential problems with meeting federal air quality standards.

FINDINGS AND CONCLUSIONS

The research provides background information on the role of transportation in the generation of air pollution, with an in-depth look at the contribution of different categories of vehicles. The research demonstrates trends in the emissions of CO, NO_x, and HC from transportation in Florida. The model used for the calculations has the following form:

$$EMx_{(year)} = AERx_{(ldv,year)} * VMT_{(ldv,year)} + AERx_{(ldt,year)} * VMT_{(ldt,year)} + AERx_{(hdv,year)} * VMT_{(hdv,year)} + AERx_{(lmc,year)} * VMT_{(mc,year)}$$

Where:

$EMx_{(year)}$ = Emission of pollutant X in Florida, in grams
$AERx_{(y,year)}$ = Average emission rate of pollutant X for vehicle type y, grams per mile
$VMT_{(y,year)}$ = Vehicle miles traveled for vehicle type y
LDV = Light duty vehicle
LDT = Light duty truck
HDV = Heavy duty vehicle
MC = Motorcycle

The following are among the findings:

- Emission rates from vehicles have been decreasing. However, in Florida, the reduction in emission rates has been partly offset by increases in total vehicle miles traveled (VMT) and changes in vehicle composition from relatively clean passenger cars to larger personal trucks and Sport Utility Vehicles (SUVs).

- The average emission rates of CO and HC per vehicle has dropped sufficiently to offset changes in vehicle composition, VMT, and population, and, in general, the total emissions of CO and HC from vehicles in Florida are decreasing

- The average emission rate of NO_x per vehicle has decreased much less than have CO and HC, such that, given increases in VMT and the change in the composition of the vehicle fleet, NO_x remains a pollutant of concern in Florida.

BENEFITS

This study indicates a general downward trend in Florida emissions based on decreasing emission rates and increasing VMT. Thus, it also provides an assurance that increasing VMT will not degrade Florida's air quality in the near future. Also, fixed sources, such as power plants, are continuing to improve their technology to reduce emissions.

From the Department's perspective, this information is useful in that it suggests that budgets should not be adversely affected as a result of non-compliance issues. Furthermore, business interests sometimes consider air quality issues when they are determining potential locations (i.e., air quality controls that they may be subjected to in order to do business at the given location). The results of this study suggest that air quality problems are not imminent in Florida and should, therefore, not be a negative factor in business decisions to locate to the State.

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