“SMART GROWTH” EMISSIONS OUTCOMES AND ENVIRONMENTAL JUSTICE IN SOUTHERN CALIFORNIA

AUTHORS

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ABSTRACT

As cities and regions work towards sustainability by enhancing transit infrastructure and increasing population and employment in targeted neighborhoods, a question arises if greater density will increase the exposure of harmful emissions to a larger number of people. This effort specifically looked at the projected emissions and exposure rates in areas targeted for “smart growth” in Southern California. Furthermore, since urban areas have traditionally held a higher share of racial and ethnic minority groups than suburban and outlying areas, this project also examined the emissions outcomes of targeted land use and transportation strategies for various population groups. The recent 2012-2035 Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS) adopted by the Southern California Association of Governments (SCAG) serves as a case study to assess the current and projected emissions attributed to such strategies. The identification of potential disproportionate impacts is in line with the environmental justice requirements in the United States set forth by the Civil Rights Act of 1964, which establishes the need for transportation agencies to disclose the benefits and burdens of proposed projects for minority populations. Results show that increased transit infrastructure and targeted growth in transit-oriented neighborhoods reduces the amount of emissions in the region, including exposure to emissions for certain racial and ethnic minority groups in future years. Alternatively, the number of persons living in areas with higher exposure is greater in some communities. In order to reduce this impact, SCAG should continue to work with partner agencies to discourage the amount of new developments that are sited in areas close to freeways and highways – which demonstrated the highest concentration of emissions factors in urban areas.

OBJECTIVES

- Determine the impacts of “smart growth” strategies to on-road vehicle emissions
- Examine if targeted growth in urban areas will translate to a greater share of people exposed to emissions, especially in areas that are in close proximity to freeways and highways
- Assess disproportionate impacts, if any, to racial and ethnic minority groups

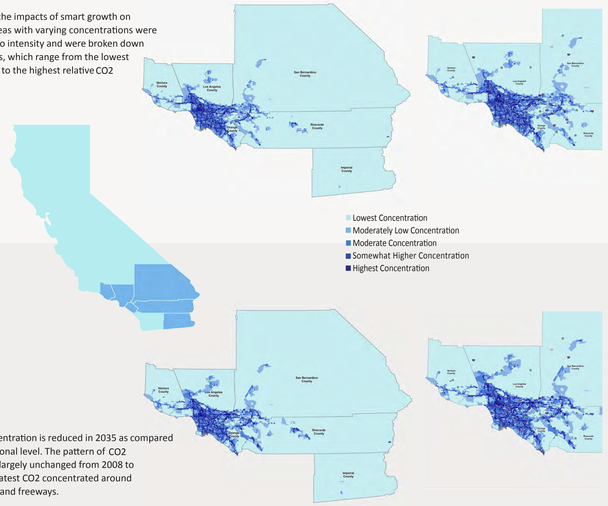
METHODOLOGY

- This study used the Southern California Association of Governments’ (SCAG) recent 2012-2035 Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS) as a case study to examine the impacts of smart growth strategies on projected on-road emissions for the horizon year of the Plan, 2035. Analysis is done at the regional level and for areas in close proximity to highly traveled corridors, and impacts are tabulated by comparing emissions outcomes for carbon dioxide (CO2) and particulate matter greater than 10 microns (PM) from the base year (2008) and horizon year of the plan (2035). Performance is gaged by each scenario’s relative percentage of population in the most impacted areas, and disproportionate impacts are assessed by comparing the concentration of racial and ethnic minority groups in such areas to their representation in the region as a whole.

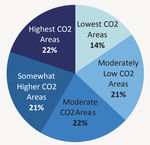
CARBON DIOXIDE (CO2)

In order to assess the impacts of smart growth on CO2 emissions, areas with varying concentrations were ranked according to intensity and were broken down into equal quintiles, which range from the lowest relative CO2 areas to the highest relative CO2

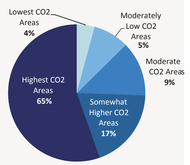
2008



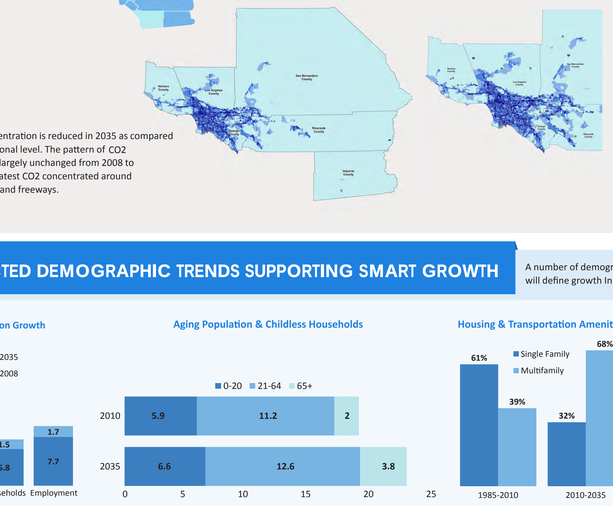
Percentage of Population for Areas with CO2 Concentrations



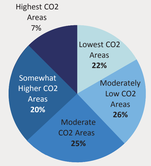
Percentage of Population by Varying CO2 Concentration for Areas in Close Proximity to Highways

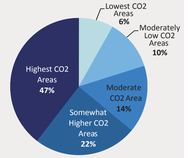


2035



Reduction in Population Share in Highest Concentration Areas from 2008 to 2035





Average CO2 concentration is reduced in 2035 as compared to 2008 at the regional level. The pattern of CO2 however, remains largely unchanged from 2008 to 2035, with the greatest CO2 concentrated around regional highways and freeways.

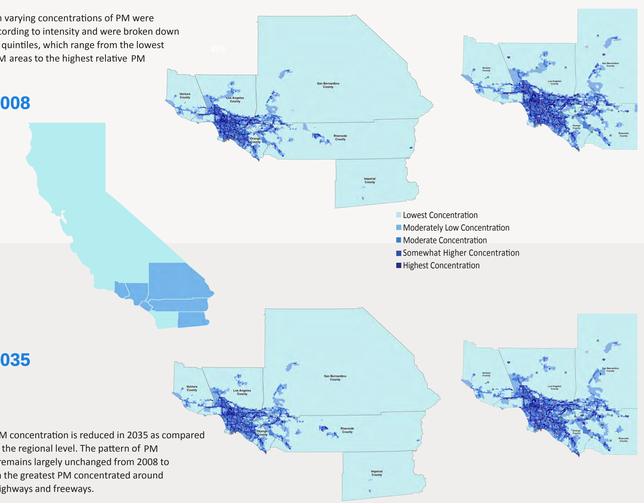
The proportion of population in the highest CO2 areas is projected to decrease from 22% of the total population in 2008 to 7% of the population in 2035 as a result of the plan

The proportion of population in the highest CO2 areas is projected to decrease from 65% of the total population in 2005 to 47% of the population in 2035.

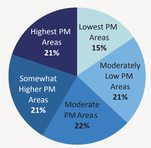
PARTICULATE MATTER LESS THAN 10 MICRONS (PM)

Areas with varying concentrations of PM were ranked according to intensity and were broken down into equal quintiles, which range from the lowest relative PM areas to the highest relative PM

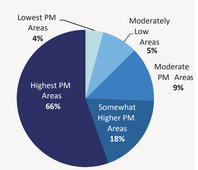
2008



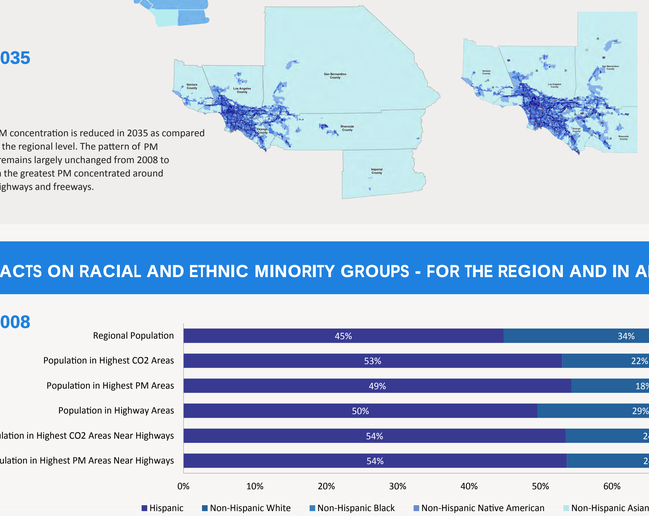
Percentage of Population for Areas with PM Concentrations



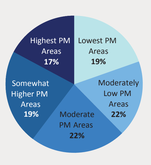
Percentage of Population by Varying PM Concentration for Areas in Close Proximity to Highways

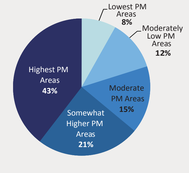


2035



Reduction in Population Share in Highest Concentration Areas from 2008 to 2035





Average PM concentration is reduced in 2035 as compared to 2008 at the regional level. The pattern of PM however, remains largely unchanged from 2008 to 2035, with the greatest PM concentrated around regional highways and freeways.

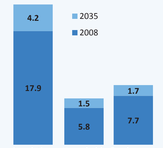
The proportion of population in the highest PM areas is projected to decrease from 21% of the total population in 2008 to 17% of the population in 2035 as a result of the plan

The proportion of population in the highest PM areas is projected to decrease from 66% of the total population in 2005 to 43% of the population in 2035. This significant decrease is promising, but still needs improvement to be on par with the region as a whole

PROJECTED DEMOGRAPHIC TRENDS SUPPORTING SMART GROWTH

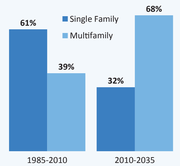
A number of demographic factors are anticipated that will define growth In Southern California in future years

Population Growth



Aging Population & Childless Households

Housing & Transportation Amenities

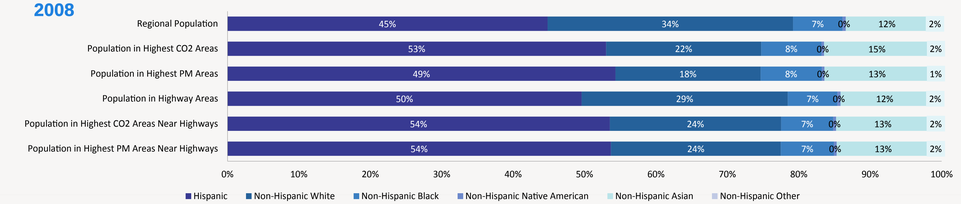


THREE KEY RTP/SCS STRATEGIES

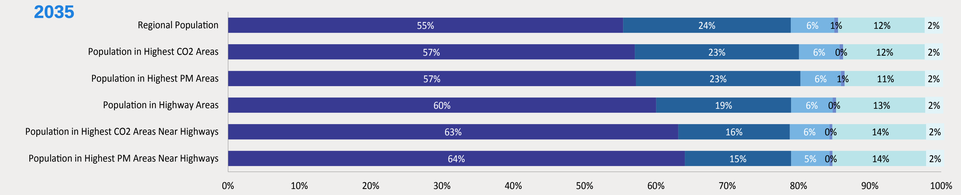
1. allocate **ONLY 13%** capital investment to highways
2. focus over **50%** growth within **3%** land area
3. **FROM 7:3** Single- vs. multi- family units **TO 3:7**

IMPACTS ON RACIAL AND ETHNIC MINORITY GROUPS - FOR THE REGION AND IN AREAS CLOSE TO HIGHWAYS

2008



2035



ABOUT SCAG

SCAG is the nation’s largest metropolitan planning organization, representing six counties, 191 cities and more than 18 million residents. SCAG undertakes a variety of planning and policy initiatives to encourage a more sustainable Southern California now and in the future.

SCAG VISION STATEMENT

An international and regional planning forum trusted for its leadership and inclusiveness in developing plans and policies for a sustainable Southern California.

SCAG MISSION STATEMENT

Under the guidance of the Regional Council and in collaboration with our partners, our mission is to facilitate a forum to develop and foster the realization of regional plans that improve the quality of life for Southern Californians.

SOUTHERN CALIFORNIA ASSOCIATION of GOVERNMENTS

SOURCES

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HEALTH RISKS IN AREAS CLOSE TO HIGHWAYS

- Urban areas are frequently crisscrossed with heavily traveled corridors, shaping these places to be some of the worst areas for on-road vehicle emissions
- Recent epidemiological studies indicate that urban residents are 1.5 times more likely to contract lung cancer than their rural counterparts [2].

- Neighborhoods that are in very close proximity to highways and freeways are also especially at risk, as particulate pollution tends to concentrate near highly traveled roadways, and drops off by about 70% outside of 500 feet (152 meters) [3].
- This heavy concentration of pollutants has a significant impact on residents’ health. In a 2004 study conducted in 12 Southern California neighborhoods, children living within 500 feet (152 meters) of a freeway had impaired growth in lung capacity as compared to children who lived more than 1500 feet (457 meters) from a freeway [4].

CONCLUSION

- “Smart growth” strategies result in a small decrease in the share of total population in areas with the highest CO2 and PM from 2008 to 2035. A larger decrease is seen for this same measure when examining areas in close proximity to highways and freeways.
- Disproportionate risk for Hispanics is reduced as a result of the plan at the regional level, but results are not as beneficial for Non-Hispanic African Americans.
- For areas in close proximity to highways and freeways, impacts are more proportionate for Non-Hispanic African Americans in 2035 than in 2008. Hispanics, however, continue to represent a higher share in areas with the greatest CO2 and PM than their representation in the regional population for 2035. Additional analysis regarding the comparison of these results to a no-build scenario for the horizon year is available in the Environmental Justice Appendix to the 2012-2035 RTP/SCS.

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