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Climate Change and Transportation

Yuri Yevdokimov
Departments of Civil Engineering and Economics, University of New Brunswick
Fredericton, Canada
Yuri@unb.ca

In its 5th Assessment Report published in 2013/2014, leading scientists on the Intergovernmental Panel on Climate Change (IPCC) expressed consensus that human activities are responsible for many observed climate changes and concluded that there is a need for far more extensive mitigation measures to address ongoing climate changes. However, while human activities cause significant climate changes on the one hand, these changes affect humans and their activities in return on the other. Therefore, it is natural to talk about two-directional link between human activities and climate change, and transportation is a good example of this approach.

Numerous studies have examined the link between climate change and the transportation sector. These studies have been conducted primarily from the perspective of transportation's contribution to global warming through the burning of fossil fuels, which releases carbon dioxide (CO2) and other greenhouse gases (GHGs) into the atmosphere. Far less attention has been paid to the consequences of potential climate changes for transportation. For example, projected increases in temperature, changes in precipitation patterns, rising sea levels, and increasing frequency of large weather events are already affecting transportation infrastructure and operations.

There are also likely to be many indirect effects of climate change impacts on transportation. Potential climate-caused shifts in demographics as well as redistribution of production and consumption in agricultural sector, manufacturing sector, forestry, fisheries and others can affect the existing transportation patterns. Transportation patterns can also shift as the tourism industry responds to changes in ecologically or recreationally interesting destinations. Eventually it may lead to significant redistribution of transportation flows.

That is why in this study we analyze the link between transportation and climate change in both directions - contribution of transportation to climate change as well as impacts of climate change on transportation.