



Regional Tolling Analysis Informs NEPA Assessment of Cumulative Impacts on Low-Income Populations

DALLAS-FORT WORTH, TEXAS

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Case Highlights

Description: The North Central Texas Council of Governments (NCTCOG), the metropolitan planning organization (MPO) for the Dallas-Fort Worth area, studied the environmental justice impacts of the tolled highways and high-occupancy vehicle (HOV)/managed lanes in the region's long range plan. The Regional Tolling Analysis (RTA) was an outgrowth of the *Mobility 2030* plan, which was adopted in 2007, and was updated as part of the most recent metropolitan long range transportation plan, *Mobility 2035*, adopted in 2011. A first of its kind in Texas, the RTA used information gathered from the travel demand model to evaluate impacts of proposed transportation projects with a pricing component (e.g., toll roads) on environmental justice populations throughout the NCTCOG metropolitan planning area. Because the projects involved tolling, low-income populations were the primary focus of the study. Using 16 dimensions of system analysis, the RTA found that any burdens were outweighed by benefits, and there would be no disproportionately high and adverse cumulative impacts on environmental justice populations. Information gained during the RTA is also included in individual environmental documents for roadway projects that have a tolling element.

Key Concepts: Regional analysis of environmental justice impacts; use of travel demand models to analyze environmental justice impacts; impacts of toll roads on low-income populations.



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Introduction

The Dallas-Fort Worth Metroplex spans 12 counties in north central Texas. The North Central Texas Council of Governments (NCTCOG) is the metropolitan planning organization (MPO) for the Dallas-Fort Worth region. The regional long range transportation plan, *Mobility 2035*, includes a substantial number of new tolled highways. The purpose of the RTA was to evaluate the cumulative impacts of a network of planned tolled highways and high-occupancy vehicle (HOV)/managed lanes on the residents of the Dallas-Fort Worth Metroplex. Environmental justice populations were given special consideration throughout the RTA. The RTA informs cumulative impact assessment during reviews under the National Environmental Policy Act (NEPA). By the time many toll projects enter NEPA review, much of the regional-level documentation, data collection, and impacts analysis are complete.

Tolling in North Central Texas

Since 1955, the North Central Texas region has developed a complex system of limited access freeways. By the mid-2000s, there was little money available to build new freeways or significantly expand existing ones. At around the same time, a series of Federal and Texas laws were passed that opened the door to private-sector involvement in infrastructure construction. The private sector responded with strong interest, and a number of toll road and tolled lane projects began being discussed.

This shift toward tolling was reflected in *Mobility 2030* (approved in 2007). Using innovative funding strategies—such as toll roads—allowed NCTCOG to leverage limited Federal funds to provide a more robust transportation system. Unlike previous toll roads in Texas—which were often standalone facilities—*Mobility 2030* called for an interconnected network of toll roads and toll lanes to criss-cross the region.

Long range transportation plans must be fiscally constrained. That is, the plan must be feasible from a financial perspective – revenue sources are identified and a cost methodology for comparing and evaluating transportation scenarios is approved. NCTCOG began its 2035 plan in 2009. At that time, there was a radically different revenue environment than in previous plans, which made the use of innovative funding even more critical to the timely implementation of transportation improvements. Even with \$45 billion less funding than projected in *Mobility 2030*, *Mobility 2035* planned for 1,435 lane-miles of tolled roadway. In addition, over 5,200 lane-miles of free roadways were included in the plan. The new tolled mileage included a system of HOV/managed (tolled) lanes on existing free roadways that had been in the planning stages for nearly two decades. Figure 1 shows the proposed new road facilities in *Mobility 2035*.

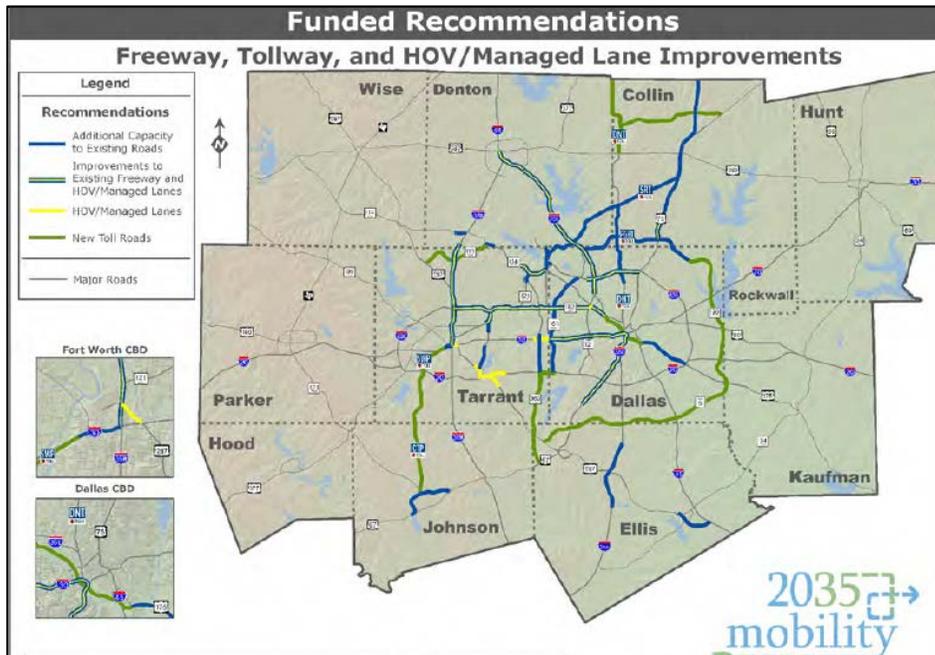


Figure 1. Proposed new road facilities in Mobility 2035. Toll roads are shown in green, and HOV/managed lanes are shown in yellow.

Tolling and Environmental Justice

Factors leading to the RTA Approach

Toll roads present a unique set of environmental justice issues. Low-income persons are least able to pay tolls. However, toll facilities can provide unprecedented access and congestion relief to the general public, including to low-income areas.

Environmental justice impacts of tolling are typically a component of NEPA analysis during project development. However, the number of tolled facilities proposed in Dallas-Fort Worth raised important questions about the equity of the planned system as a whole: Would the proposed right of ways displace people? Would

certain neighborhoods benefit more than others? Would people in low-income communities have to pay a disproportionate share of their income to have regional mobility?

With the large number of interconnected toll facilities, individual project analyses did not address the potential cumulative impact of tolling. In 2006, NCTCOG, the Texas Department of Transportation (TxDOT), and the Federal Highway Administration – Texas Division (FHWA-TX) jointly decided to conduct a tolling analysis for the entire region. This analysis was updated for the most recent metropolitan transportation plan, *Mobility 2035*.

By analyzing toll roads on a regional basis, impacts are documented for the proposed system. Regional tolling analysis is now standard practice for regions in Texas with a formal network adopted in their long range transportation plan. Lessons learned from the NCTCOG RTA were formalized into joint guidance from FHWA-TX and TxDOT issued in April 2009.¹

Regional Tolling Analysis Methodology

The current RTA (published in March 2012) took nine months to complete and required involvement of eight staff members on a part-time basis. NCTCOG used its travel demand model to process data for the RTA. NCTCOG's model is a proprietary system built on the TransCAD platform. Although not specifically designed to perform analysis for an RTA, the model proved to have the best available information on topics related to the potential impact of tolls on environmental justice communities. Modeling software uses information on trip generation, trip attraction, mode choice, and route assignment to forecast traffic congestion and other measures of performance on the transportation system. For this analysis, the region is divided into transportation survey zones (TSZs), often referred to as traffic analysis zones (TAZs) in other areas of the country, which vary in size but closely resemble Census Block Groups. The model forecasts travel between TSZs based on the historical travel patterns of residents of the Dallas-Fort Worth region.

Because the TSZs line up closely with Census boundaries, the results from the model produce

¹ Available from: http://ftp.dot.state.tx.us/pub/txdot-info/env/joint_guidance_toll.pdf

Project Chronology

2003-2005

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) and Texas State Statute allow for greater private sector participation in infrastructure construction.

2006

NCTCOG begins development of *Mobility 2030*.

Early drafts of *Mobility 2030* show a large number of proposed toll roads and tolled lanes.

January - April 2007

Mobility 2030 is adopted by NCTCOG.

FHWA-TX, TxDOT, and NCTCOG hold additional meetings to discuss toll roads and the methodology of the RTA. FHWA requests analysis of the entire tolled system, in order to consider impacts of the system on the region as a whole, in addition to the analysis for individual projects.

May 2007 – 2009

The RTA was prepared on a project-by-project basis, with support from NCTCOG travel demand data.

April 2009

TxDOT issues guidance on environmental justice, Regional Network Land Use, and Air Quality Analyses for Toll roads. This guidance applies to all of Texas, and is based on the success of the NCTCOG RTA.

2010

RTA is revised because of the changes made for *Mobility 2030*, 2009 Amendment. Various meetings were held between TxDOT, FHWA, and NCTCOG. A final version was produced in late 2010.

2011- 2012

RTA process was refined during NCTCOG's plan update for *Mobility 2035*. Other regions of Texas also perform RTAs.

information that can be analyzed for environmental justice impacts. Because the model records the TSZs where trips originate, it can evaluate the impacts on travel from that TSZ.

The basic idea of the RTA was to compare the impacts of the entire system shown in the plan with a system with no additional tolled facilities. For control, a “no-build” scenario is also discussed. Any changes to forecast impacts could be attributed to the toll roads.

Data Used

For the current RTA, data was gathered during the development of *Mobility 2035*, and consisted mostly of information from the American Community Survey (ACS), which is collected by the US Census Bureau. The ACS asks questions formerly found on the Census long form, and is compiled on a rolling three-year basis. Census information was paired with TSZs used in the travel demand model. Environmental justice TSZs were identified based on the Federal Council on Environmental Quality (CEQ) guidance document *Environmental Justice: Guidance Under the National Environmental Policy Act*.² TSZs were considered to contain environmental justice populations if:

- The non-white population is greater than 50 percent.
- 50 percent or more of the households in the TSZ are in Census Block Groups where the median income is lower than the 2009 poverty threshold of \$22,000.

² Available from:
http://www.epa.gov/compliance/ej/resources/policy/ej_guidance_nepa_ceq1297.pdf

TSZs are classified into four categories: non-environmental justice TSZs, minority alone TSZs, low-income alone TSZs, and both minority and low-income TSZs.

There are 5,252 TSZs within the metropolitan planning area (MPA). A total of 2,274 TSZs are considered environmental justice TSZs (111 low-income alone; 1,942 minority alone; 221 both low-income and minority). Figure 2 shows the TSZs in the Dallas-Fort Worth Metroplex that meet the environmental justice qualifications previously stated.

Although North Central Texas has a high proportion of minority residents, income was considered a more important consideration because the burdens of a toll network are largely financial.

Each model “run” entailed inputting data and letting the computer forecast travel throughout the region. Each model run can take up to two days to complete.

Results of RTA Analysis

The RTA found that building the tolled system did not place undue burdens on any environmental justice protected areas or classes. The toll system does not cause a disproportionately high and adverse impact on environmental justice populations. In cases where there was an impact to environmental justice populations, the benefits were determined to outweigh any impacts. Therefore, no remediation or mitigation was recommended.

This conclusion was reached by analyzing 16 different dimensions of potential impacts. Most

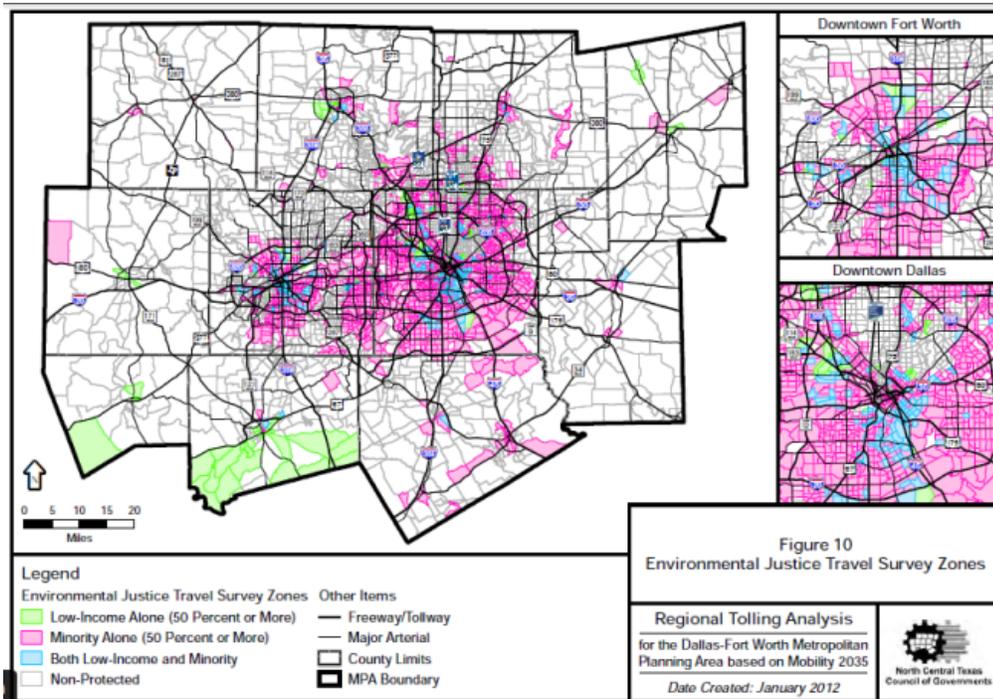


Figure 2. TSZs in the Dallas-Fort Worth Metroplex meeting the environmental justice qualifications used for the Regional Toll Analysis

of the evaluation criteria mirror information found in NCTCOG’s Congestion Management Process (CMP), but instead look at impacts on environmental justice TSZs. Additional criteria—particularly the regional origin-destination study—required a specialized set of queries on the model data. None of the criteria had a pre-determined threshold of “disproportionate” impact. The criteria and analysis results were:

- Access to jobs – More jobs are accessible from environmental justice

areas by a 30 minute drive and 60 minute transit trip.

- Regional congestion – Environmental justice populations have lower congestion than non-protected populations, although traffic increased for all groups.
- Average travel time – Travel time went up for all groups.
- Daily vehicle miles traveled – Arterial and collector roads will experience less congestion for all groups using those facilities.

- Average loaded speed – No difference was observed between environmental justice and non-environmental justice groups.
- Morning peak period roadway trip length – No difference was observed between environmental justice and non-environmental justice groups.
- Morning peak period roadway trip speed – Speeds increased for all groups.
- Morning peak period transit usage – Transit use is higher for all groups.
- Morning peak period transit trip times – Trip times are higher for all groups.
- Morning peak period transit trip lengths – Trip lengths are longer for all groups.
- Morning peak period transit trip speeds – Trips are faster for all groups.
- Congestion levels – Environmental justice TSZs are projected to have fewer “no congestion” and “severe congestion” TSZs, but more “light to moderate congestion” TSZs than the non-environmental justice areas. The construction of additional facilities in the 2035 build network would reduce the percentage of environmental justice TSZs with severe congestion.
- Regional origin-destination study – Priced facilities would increase accessibility for environmental justice populations.

Connection with NEPA

A NEPA review contains: (a) discussion of the regional cumulative effects; and (b) a project-specific analysis. The project-specific review discusses tolling-equity issues from the proposed project only on the directly impacted user, while the regional component looks at

equity and mobility in a more comprehensive view. Examples of tolling topics found in the project-specific component include: available alternative travel options, toll-collection policies, anticipated toll rates, and methods of toll collection.

If project-specific analysis finds that tolls cause an undue burden, there are a number of options a region might pursue for remediation:

- Toll abatements allow qualified individuals to pay less (50 percent deduction for HOVs) or no tolls (for transit users).
- Proceeds from tolls can be applied toward transit, additional toll roads, or non-toll facilities that serve the affected region.
- Individuals without bank accounts can be given an alternative to cashless tolling systems, such as using an electronic benefits transfer (EBT) card (which encompasses the former food stamps program).

Meanwhile, the regional tolling component looks at the cumulative impacts of the entire tolled system, and how the tolling aspects might affect environmental justice groups throughout the region. The impact of a project on the full regional system was already disclosed during the RTA, so the regional component is simply summarized from the full RTA and included in the cumulative-effects section of a NEPA document.

Required documentation in a NEPA report has been significantly reduced by the RTA. Prior to the RTA, a NEPA report on the cumulative regional impacts of tolling was often more than 50 pages in length. This analysis could be a laborious task, due to specialized data collection. After the RTA, the level of effort required for the study is substantially reduced. Further, the

documentation included in the NEPA report is much shorter—in the range of four to five pages for the regional component. The simpler documentation is due to the ability to refer to the RTA for methodology discussion and select out only the part of the analysis that pertains to the project.

Data generated during the RTA has also been useful during right-of-way acquisition and construction phases of the process. Because information is already gathered on the areas of the City with protected populations, right-of-way purchases in protected areas can be given advance scrutiny. Similarly, remediation actions during construction (signage, access, noise) can be identified in advance, and their impacts minimized.

Effective Practices and Lessons Learned

The RTA is a powerful tool during planning and programming, but is also useful in later phases of the infrastructure construction process—particularly during NEPA. In effect, the time required to deliver the social justice components of the cumulative impact analysis in NEPA is substantially reduced. This shift helps streamline NEPA and deliver projects more quickly.

By combining Census information and the travel demand model, NCTCOG created a powerful tool for analysis of socio-cultural impacts and environmental justice. The tool was able to generate a detailed map of the region's environmental justice population that could evaluate impacts on 16 different dimensions. Further, this system was replicated in subsequent plans and emulated by other regions. The effort has enhanced the government's awareness and knowledge of the environmental justice concerns

in the region (but does not replace project-level public involvement).

Title VI and environmental justice are usually discussed during Socio-economic Effects Analysis or Community Impact Analysis. The RTA completes much of the data-oriented work well before the NEPA process even begins. In addition, considering impacts at the system level, can result in a more accurate and thorough examination of potential cumulative impacts of all planned projects as a whole.

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