U.S. Department of Transportation
Federal Highway Administration

Spotlight: Equity in Transportation

The Federal Highway Administration's (FHWA) GIS in Transportation program coordinated with the Wilmington Area Planning Council and the Corpus Christi Metropolitan Planning Organization (MPO) to showcase equity-related GIS pursuits.

Building a Robust Transportation Equity Initiative in the Wilmington, Delaware Region

By William Swiatek, AICP

The Wilmington Area Planning Council (WILMAPCO) has one of the strongest transportation equity initiatives in the country. Planners at the midsized Metropolitan Planning Organization (MPO) – which serves a mainly suburban population of 660,000 in New Castle County, Delaware and Cecil County, Maryland – credit this to experience. The initiative has evolved over two decades, with each of the agency's half dozen successive transportation equity plans building upon work in the previous one. This article will highlight several aspects of their effort, which rely heavily on GIS analyses, which set it apart.

WILMAPCO's "Transportation Justice," or TJ, initiative groups all equity related MPO requirements (Ex. Title VI/EJ/ADA/LEP) into a single plan. Developed with partner agencies including the Delaware and Maryland Departments of Transportation and members of WILMAPCO's Public Advisory Committee, the plan makes recommendations based on technical analyses, policy considerations, and community engagement successes or challenges. WILMAPCO has found that this streamlined, single-plan approach reduces redundancy and ambiguity in meeting federal requirements, and also improves its Council and Committee awareness of transportation equity.

While it produces a single, overall plan, WILMAPCO does not employ a one-size-fits-all index to identify vulnerable communities. Instead, it uses more than six different indices, from Environmental Justice Neighborhoods to Areas of High Social Determinants of Health Concern to Urban Technology Deserts, for specific uses. These uses include project prioritization, community engagement considerations, or technical equity analyses. While more involved than a one-size-fits-all approach, this method tailors specific analyses—and ultimately interventions—to the most relevant populations.

Diving deeper into its screening methodology, WILMAPCO also does not generally consider racial and ethnic minorities a single, cohesive group. Individual minority communities are instead screened and flagged separately in both neighborhood identification and equity analyses. For regions with racial/ethnic minority populations of varying sizes, this is an important detail. In the WILMAPCO region, for example, Black is the largest racial/ethnic group,

representing 21% of the total population. Hispanics, meanwhile, comprise less than 9% of the population. Because of their smaller population size relative to Black people, Hispanic concentrations may go undetected if identified based on the percentage of total racial/ethnic minorities, as is common in most state and MPO equity analyses. This is even more likely for the region's even smaller Asian communities.

WILMAPCO's analysis screens Census data for Black, Hispanic, and Asian neighborhood concentrations separately based on that individual group's share of the regional population. It does the same for other groups it calls "mobility challenged," including seniors, people with disabilities, and people living in households without vehicles that are also covered in its TJ initiative. And these groups often cluster in entirely different places.

This provides a more accurate basis to use the flagged neighborhoods for transportation equity analyses, or within a place-based project prioritization process, as WILMAPCO does. In its 2019 TJ Plan, for example, WILMAPCO found that Black neighborhoods received 38% less planned transportation spending than would be expected based on their population size in its Transportation Improvement Programs (TIP) since 2002. It did not find the same disparity with Hispanic, Asian, or impoverished neighborhoods. That finding led to a specific adjustment to WILMAPCO's prioritization process whereby projects within Black neighborhoods received an extra point boost to support closing the equity gap.

Finally, in addition to TIP equity spending, WILMAPCO examines a dozen other transportation equity indicators, from crashes to bicycle level of traffic stress. Reflecting the evolutionary nature of WILMAPCO's transportation equity initiative, many of these analyses began as experiments and were later refined in subsequent plans. A good example of this is its analysis of neighborhood connectivity. A 2015 analysis examined the connectivity of mobility-challenged neighborhoods to libraries, grocery stores, hospitals, and senior centers by four different transportation modes: walking, biking, fixed-route bus, and car. Neighborhoods with poor connectivity were flagged for more detailed study and intervention. In 2019, WILMAPCO built upon this analysis by examining connectivity from not just mobility-challenged neighborhoods, but every neighborhood, and more than doubled the destination types analyzed. The results produced a comprehensive picture of regional connectivity by mode for the first time, with clear possibilities for future performance measurement. A follow-up study is currently underway to investigate possible bus routing and frequency adjustments based on the findings.

WILMAPCO aims to refresh its Transportation Justice Plan after updating its long-range plan in early 2023. One new area it is exploring is further supplementing Census data to screen for vulnerable communities. Census tract and block group data are too often not representative of neighborhoods due in part to how their boundaries are drawn. Large geographies in rural areas mask isolated pockets of rural poverty, while segregated gentrified districts in cities skew socio-economic data for impoverished communities sharing the same boundary. While WILMAPCO currently incorporates subsidized housing unit data and low-income student data into its screening criteria to help mitigate this, it is exploring point-level home price data to further supplement future analyses. Learn more about WILMAPCO's TJ initiative on their website.

Equity in Transportation at Corpus Christi MPO

By Craig T. Casper AICP, CTP CEP

Questions of justice and equity are now central to transportation investment decision-making, demanding that we consider causal chains and how interventions interconnect and who benefits at the expense of whom. Like all MPOs and state DOTs, the Corpus Christi Metropolitan Planning Organization (MPO) is committed to ensuring that plans and programs equitably meet our regional needs, while avoiding disproportionately high and adverse effects on disadvantaged populations. In an effort to increase transparency and expedite participation from external groups, the Corpus Christi MPO combined the update to several documents and policies, creating a single program addressing discrimination. This single program addresses Title VI, Executive Order 12898 on Environmental Justice, Executive Order 13166 on Limited English Proficiency (LEP), and the new Executive Order 13985 on Advancing Racial Equity. Unifying these efforts produced a single Community Profile document and a two-part discrimination analysis process.

Geographic Information Systems are our most powerful quantitative tool for analyzing the estimated positive and negative disparity between disadvantaged or underserved groups and other populations. When conducting impact analyses for each stressor it is important to remember that disparity is the amount of separation between the groups that are most vulnerable to inequality and injustice and the group identified as the most favored group, not against the concocted means or medians for a region.

The first part of the analysis embodied a concept known as procedural justice and encompassed our efforts to expedite participation by disadvantaged and vulnerable communities in our regional transportation planning and programming processes. The team acknowledges that this zonal approach discounts the fact that not all members of a protected group live in identified areas of concern and that not all people in the identified areas of concern are from a protected group. That said, the Corpus Christi MPO used a modified version of the Delaware Valley Regional Planning Commission Environmental Justice analysis procedures. These procedures generate a composite APD score, which meets the nondiscrimination requirements.

The project team also understands that these composite indicators obscure the conditions faced by individual groups, so we also maintained each individual qualification area for future analyses. We did this because we believe that disproportionately affected communities often suffer from multiple interconnected stressors, where negative impacts in one area can trigger a cascade failure throughout the community. These areas with multiple vulnerabilities must be acknowledged.

Evaluating procedural justice required the identification of vulnerable and disadvantaged communities and Corpus Christi MPO is now continuously verifying that they have transparent and open access to decision-influencing information, transparent and open access to decision-making processes, and additional opportunities for direct participation if they are, or may become, inequitably impacted.

The second part of the process is more technically involved. Quantifying distributional equity builds upon the procedural justice zonal system and identifies and highlights pre-existing disparities among vulnerable populations. These baselines also allow project sponsors and funding agencies to begin to identify projects that deliberately address the disparities and establish a marker for goal-setting. This effort requires the Corpus Christi MPO, (and all MPOs and state DOTs) to conduct a three-step set of analyses:

1. Establish the baseline distribution of inequities in amenities and exposures to hazards within and among communities and geographies.
2. Analyze the forecast outcomes from projects for the different groups and compare the distribution of impacts to the identified needs of the disadvantaged groups.
3. Identify how the proposed projects improve or worsen the situation for the disadvantaged or vulnerable people compared to the most benefitted populations.

When establishing baselines and determining inequities, the Corpus Christi MPO must be cognizant of different data sources or data from different scales or with different collection procedures possibly providing different answers to the same questions. To mitigate this, the Corpus Christi MPO is using multiple indicators and several approaches in order to triangulate or bookend conditions and consequences. The data that we are currently developing to compare and contrast potentially inequitable conditions are based on the national goals from FAST:

- Crash analyses for representative intersections,
- Congestion analyses of representative intersections,
- Pavement and bridge conditions,
- Walk and Bike accessibility score analyses,
- MOVES3 hotspot analysis,
- Extreme weather vulnerability,
- Spatial distributions of trip-ends into the zones, by time of day.

After establishing the various conditions within zones, the Corpus Christi MPO team will begin providing decision-makers and the public with information about the type, size, and location of positive and negative impacts attributable to each submitted project. This is a continuation of the performance-based planning and programming designed to facilitate ranking the projects adopted in the long-range plan.

The final step in the equity analysis is determining the degree to which the projects submitted improve or degrade previous disparities for vulnerable communities, or create new disparities where none previously existed.

The purpose of this is providing decision-makers, the public, and regulators with useful information for discussions and decision-making regarding the use of federal funds in our region. Looking ahead, the team is beginning preparations for understanding the trade-offs that are necessary if/when one disadvantaged group suffers in order that another disadvantaged group can benefit. The MPO is also discussing the compromises that different funding and policy agencies must make in their interventions in order to improve overall outcomes.

The conversations necessary for these process improvements to happen between agencies at various state and federal levels are in the future and will likely require transportation professionals to utilize Inequality Indices.

Other News
Newly Available

Case Study on Crowdsourced Data and Safety
This case study report focuses on the use of crowdsourced data collection methods and how transportation agencies use this data to improve transportation safety. To gather information for this report, the U.S. DOT Volpe National Transportation Systems Center interviewed eight transportation agencies and developed a case study focusing on their experiences. The purpose of this document is for State DOTs and MPOs to consider the notable practices that these agencies used in collecting, analyzing, and utilizing different crowdsourced data types to improve safety. To read this, visit: https://www.gis.fhwa.dot.gov/Reports.aspx.

For more information about this newsletter, please contact Mark Sarmiento, FHWA Office of Planning, at Mark.Sarmiento@dot.gov.