VOLUME III, SECTION III.
TRANSPORTATION NEEDS AND EQUITY

INTRODUCTION

Transportation is essential to human existence. People must be able to access homes, work sites, schools, shops, and other places on a daily basis. Due to the large size of metropolitan areas today, complex transportation systems are necessary to facilitate access to goods, services, and activities. Transportation infrastructure provides benefits to people by improving accessibility and mobility, thus increasing opportunities for a better quality of life.

As metropolitan areas have experienced rapidly expanding growth over recent decades, provision of transportation infrastructure necessary to accommodate that growth has not kept pace. Thus, large metropolitan areas are increasingly faced with severe problems of traffic congestion and delays that rob individuals and companies of millions of hours of lost time and productivity. Significant improvements in transportation can reduce these economic and social costs, and alleviate some of the burdens imposed by the population size and geographic extent of our metropolitan areas.

Because provision of transportation infrastructure confers benefits and reduces costs, decisions concerning how transportation revenues and resources are distributed become critical. These decisions are particularly vexing today as so many states and metropolitan areas must address rapidly growing transportation needs and must also vie with each other for the fixed amount of resources available for transportation infrastructure provision. Adding to these pressures is the increasing realization that all individuals and groups in society should be treated fairly; that there should be no discrimination on the basis of race, ethnicity, gender, disability, geographic location, or other characteristics of the population. Distribution of resources must address these *equity* concerns along with the more standard problems associated with efficiency of resource use.

Conceptual Background

The study of transportation equity confronts issues associated with the distribution of transportation resources and costs, with a concern for fairness to individuals and groups. Robert Bullard and Glenn Johnson have identified three broad areas of transportation inequity in which disparate outcomes in transportation planning, operation and maintenance, and infrastructure development can be categorized:[1]

1) *Procedural Inequity*—The process by which transportation decisions are made may not be equitable. The process should be uniform, fair, and consistent and must involve diverse public stakeholders. Procedural equity analysis considers whether the rules apply equally to everyone.
2) *Geographic Inequity*—Transportation resource decisions have geographically distributive impacts. Some places (metropolitan areas, rural areas, central cities,

[1] Bullard, Robert D. and Johnson, Glenn S. 1997. *Just Transportation*, p. 2.

suburbs, etc.) may benefit more than others. Geographic equity analysis is concerned with the degree to which transportation resource decisions disproportionately favor one geographic area or spatial location over another.

3) *Social Inequity*—Transportation resource decisions have socially distributive impacts across population groups. Concerns focus on the degree to which wealthier and more educated segments of society receive disproportionately more benefits, while the burdens fall more on people of color and those with lower socioeconomic status.

Bullard approaches the study of transportation equity from the perspective developed in his work on environmental justice.[2] Much of the environmental justice debate has focused on the degree to which low-income and minority communities contain environmental disamenities, such as hazardous waste sites, landfills, incinerators, and other polluting industries.[3]

The U.S. Department of Transportation has adopted a policy position concerning environmental justice (Department of Transportation Order on Environmental Justice, DOT Order 5610.2, dated April 15, 1997) in accord with Executive Order 12898 (EO 12898, dated February 11, 1994). This Order requires federal agencies to achieve environmental justice by identifying and addressing disproportionately high and adverse human health and environmental effects, including the interrelated social and economic effects of their programs, policies, and activities on minority populations and low-income populations in the United States.[4] Both the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) have adopted policies to integrate environmental justice principles with existing operations, to prevent disproportionately high and adverse effects, and to identify actions to address these effects if they occur.[5] FHWA and FTA are beginning to require that MPOs perform analysis regarding the extent to which their plans provide equal service to all neighborhoods, thus showing no evidence of any systematic patterns of negative bias toward certain neighborhoods or classes of people.[6]

Todd Litman identifies three types of transportation equity, though a little differently than Bullard and Johnson:[7]

1) *Horizontal Equity*—This is the fairness of cost and benefit allocations among individuals and groups who are considered comparable in wealth and ability. The most straightforward approach to this form of equity analysis assumes that consumers "get what they pay for and pay for what they get." Geographic equity analyses,

[2] See, for example, Bullard, Robert D. (1990). *Dumping in Dixie: Race, Class, and Environmental Quality*. Boulder, CO: Westview Press, or Bullard, Robert D., ed. (1993) *Confronting Environmental Racism: Voices from the Grassroots*. Boston: South End Press.

[3] Engelstad, Jeffrey L. (1997) Hazardous Waste Sites and Nearby Residential Populations in Metropolitan Denver: Implications for Environmental Justice within the Framework of Industrial Location and Residential Change (PhD Dissertation, University of Denver).

[4] U.S. Department of Transportation, Federal Highway Administration. FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, Order 6640.23, December 2, 1998.

[5] Ibid.

[6] Correspondence with Bruce McDowell, Intergovernmental Management Associates, November 17, 1999.

[7] Litman, Todd. 1999. Evaluating Transportation Equity. Victoria Transport Policy Institute Paper, p. 1.

especially donor/donee analysis, and procedural equity analyses would fit within this category.

2) *Vertical Equity with Regard to Income and Social Class*—This form of equity explicitly considers how benefits are allocated to income and social classes. Concerns may focus on improving benefits to lower income and other socially disadvantaged groups. The primary focus is on social inequity, but procedural and geographic inequity may also be applicable here.
3) *Vertical Equity with Regard to Mobility Need and Ability*—This form of equity assumes that all individuals should have at least a minimum level of access, even if people with special needs require extra resources. Attention here tends to be focused on access for physically disabled people to public facilities, as well as support for transit and special mobility services. Procedural, geographic, and social inequity may all be relevant here as well.

Reflective of the increasing concern with the fairness of the distribution of transportation costs and benefits, the most recent federal transportation legislation was named the Transportation Equity Act for the 21st Century (TEA-21). Among other things, it sought to establish a minimum guaranteed amount of funding to each state, equivalent to at least 90.5% of the transportation revenues each state paid to the federal government. This recognition of horizontal geographic equity has raised the profile of transportation equity concerns throughout the states and metropolitan areas, and has resulted in increased numbers of studies, symposiums, and cases on the subject.[8]

One such study, conducted by the Surface Transportation Policy Project, presented a donor/donee analysis of federal ISTEA spending from 1992-1997 to each state and metropolitan area in the nation.[9] The analysis was based on how much each state and metropolitan area contributed to the Federal Highway Trust Fund, and how much each place received from the Fund in return. The states which received the most in relation to what they paid were Alaska ($4.06 for every dollar paid), District of Columbia ($3.82), Hawaii ($3.62), and Massachusetts ($3.54), while the states which received the least included Virginia ($0.63), South Carolina ($0.71), Georgia ($0.71), Texas ($0.73), and Louisiana ($0.77). Results showed that Colorado was a donor state, receiving only $0.82 for each dollar it contributed to the Federal Highway Trust Fund. Additionally, each metropolitan area in the State, except for Pueblo, were also donors. The Denver Metropolitan Statistical Area (MSA) received $0.88, Boulder-Longmont received $0.55, Fort Collins-Loveland received only $0.23, while Pueblo received $1.23 on the dollar. Small towns and rural areas in Colorado were donees, receiving $1.12 for each dollar contributed.

[8] For example, a "Just Transportation" symposium was held in Austin, Texas (August 12, 1999), and a recent court case involved equity concerns for transit service provision in Los Angeles.

[9] Surface Transportation Policy Project. 1996. Getting a Fair Share: An Analysis of Federal Transportation Spending. Also, Surface Transportation Policy Project. 1999. A Donor/Donee Analysis of ISTEA Spending: Preliminary Results.

While the inequities that this study reveals are striking, there are several reasons why geographic distributions of transportation funds can never be totally equitable on the basis of a single measure.

1) A transportation system relies upon connectivity for its effectiveness. Certain states and rural areas without large populations to contribute large amounts to a trust fund will need to be subsidized for their portions of the transportation system. Geographically large states with relatively small populations, such as Alaska or Montana, are good examples. Likewise, metropolitan areas tend to be donor places, while rural areas are donee for the same reason.

2) Equity analysis also brings into question the location of the users of transportation resources. For the most part, transportation resources benefit people directly on the basis of geographic area, i.e. residents of Colorado are the largest beneficiaries of resources directed to Colorado. But residents of Colorado also benefit from resources spent on Interstate Highways and other nationally important infrastructure in other states both directly and indirectly. Direct benefits accrue from use whenever travel is required in other locations, while indirect benefits result from efficiencies and economic productivity gained through ameliorating nationally and regionally significant bottlenecks. A good example might be the large Central Artery Project in Boston that will certainly benefit the people of Boston and Massachusetts the most, but will have both direct and indirect benefits for others as well.

   These caveats become even more relevant at smaller scales. People living in metropolitan areas rely on roads and facilities throughout their states. For example, residents from the Denver metropolitan area rely on transportation infrastructure provided throughout the entire state. The same is also true for residents in other parts of the State who benefit from infrastructure built in the Denver metropolitan area. When looking at the regional scale, it becomes even more difficult to ascribe benefits directly. For example, expenditures on projects in the City and County of Denver benefit everyone in the metropolitan area who may need to use those facilities on a daily basis, regardless of residential location. The daily travel and activity patterns of metropolitan area residents are metropolitan in scale, and thus it is problematic to ascribe benefits to individual counties or municipalities on the basis of direct transportation resource allocation. For illustrative purposes, Table 1 shows total daily vehicle trips in the DRCOG region by county of origin, subdivided into those trips which end in the *same* county and those trips which end in a *different* county.

Table 1
Total Daily Vehicle Trips, 2001 (est.)

County	Begin in County	Begin and End in County	Begin in County, End in Other County	% of Trips End in Other County
Adams	1,007,000	571,000	436,000	43.3%
Arapahoe	1,561,000	900,000	661,000	42.3%
Boulder	909,000	749,000	160,000	17.6%
Denver	1,847,000	983,000	864,000	46.8%
Douglas	467,000	236,000	231,000	49.5%
Jefferson	1,691,000	1,116,000	575,000	34.0%
Sub-Total	7,482,000	4,555,000	2,927,000	

Source: DRCOG, Denver Regional Travel Demand Model

3) Just because funds for a project are allocated to a jurisdiction does not mean that all members of that jurisdiction necessarily want the project. An assumption that undergirds much of this MPO study is that jurisdictions favor more projects in their geographic area. If a city or county submits a proposal for a transportation project, it is assumed that this need represents the desire of the population of that jurisdiction. This may not always be true. For example, there are residents of a jurisdiction who may be negatively impacted by a transportation project to be built in their immediate vicinity. Highways built in central city areas may serve the needs of central city and metropolitan residents at the expense of central city residents who live right next to the highway. Expenditures on highways in rural areas that largely benefit metropolitan residents may show up as benefiting only the rural areas. Distributional analyses must recognize these and other caveats.

Measures and Approaches Used to Assess Distributional Equity

With the aforementioned caveats in mind, there are several measures that have been used historically as either prescriptive factors on which to base geographical distributions of transportation funds, or as assessment criteria on which to judge the equity of distributions. The Colorado Department of Transportation included consideration of the following measures in its 1998 resource allocation process analysis:[10]

Population	Land Area	Vehicle Miles Traveled
No. of Accidents	Person Miles Traveled	Truck Miles Traveled
Freight Miles Traveled	Center Line Miles	Terrain Type
Urban vs Rural	Infrastructure Inventory	Weighted Hazard Index
No. of Transit Vehicles	Historical Funding Trends	Vehicle Registration
Fuel Usage	Miles of Facility Type	Lane Miles
Surface Condition	Bridge Index	Mobility Index

[10] Colorado Department of Transportation. Year 2020 Revenue Projections and Resource Allocation Program, January 22, 1998, p. 29.

The U.S. Department of Transportation, and other state DOTs, MPOs, and local transportation planning departments all use combinations of measures in some form or another on which to base allocations of funding and/or projects. Resource allocation is a problem across different scales of analysis, whether it is federal allocation to the states, state allocation to regions and MPOs, or MPO allocations to counties, cities, and towns. Scale is very important, however, because effective and equitable distributions depend on the nature of the geographical areas involved.

The General Accounting Office (GAO) produced a report, "Highway Funding: Alternatives for Distributing Federal Funds," in which the federal formula for distributing funds to the states was analyzed. The four major objectives of the federal allocation process were: 1) maintaining and improving the highway infrastructure by distribution of funds based on measures of need, 2) returning the majority of funds to where they are generated, 3) advancing specific goals, and 4) preserving historical funding shares.[11] In trying to address needs, the GAO recognized that using direct measures of need, such as miles of poor pavement or number of deficient bridges, could foster a perverse incentive that would encourage infrastructure to deteriorate.[12] Using proxies for need, such as the extensiveness of the highway system (lane miles) and how heavily it is used (vehicle miles traveled), was preferable to using direct measures of need, although some transportation officials argued that these measures might promote more highway use, and would be at odds with energy conservation and clean air goals.[13] Alternative proxies, such as population and population density, would also approximate needs but were seen as favoring urban areas over rural areas.[14]

Allocating funds in proportion to the amount collected is preferable to some state transportation officials, but others were concerned about addressing national objectives, such as preserving the National Highway System.[15] In 1993, distributions of federal highway funds to states in relation to amounts each state contributed to the Highway Trust Fund ranged from 83% in South Carolina to 707% in Hawaii.[16] Set-asides, or incentive payments, could be used to advance selected goals, and could be added to the regular apportionment of funds. It was also noted that some safeguards, such as placing a cap on the maximum percentage of loss, would mitigate against the sudden loss of historical funding shares.[17]

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[11] General Accounting Office. 1995. Highway Funding: Alternatives for Distributing Federal Funds. GAO/RCED-96-6, p. 3.
[12] General Accounting Office. 1995. Highway Funding: Alternatives for Distributing Federal Funds. GAO/RCED-96-6, p. 6.
[13] General Accounting Office. 1995. Highway Funding: Alternatives for Distributing Federal Funds. GAO/RCED-96-6, p. 6.
[14] General Accounting Office. 1995. Highway Funding: Alternatives for Distributing Federal Funds. GAO/RCED-96-6, p. 6.
[15] General Accounting Office. 1995. Highway Funding: Alternatives for Distributing Federal Funds. GAO/RCED-96-6, p. 6.
[16] General Accounting Office. 1995. Highway Funding: Alternatives for Distributing Federal Funds. GAO/RCED-96-6, p. 6.
[17] General Accounting Office. 1995. Highway Funding: Alternatives for Distributing Federal Funds. GAO/RCED-96-6, p. 7.

The STEP 21 coalition produced a Streamlined Transportation Efficiency Program for the 21st Century that relied on three factors: total public highway miles (reflecting extent of system), vehicle miles of travel (reflecting use of the system), and diesel fuel consumption (reflecting greater costs caused by heavy trucks).[18] Urban lane-miles and vehicle-miles of travel would receive a greater weight to reflect increased needs and costs on urban routes.

The Minnesota Department of Transportation conducted an analysis of target funding scenarios for substate allocation. They started with 33 measurement factors, but settled on 14 measures for additional consideration, organized into 3 categories[19]:

SYSTEM CHARACTERISTICS

System Health

1) Pavement quality index
2) Bridge sufficiency rating
3) Accident rates or number of accidents
4) Congestion on the trunk highway system

System Size

5) Bridge Area
6) Lane miles on all roads
7) Lane miles on the federal aid system
8) Number of transit vehicles

CONTRIBUTIONS

9) Vehicle-miles of travel (on all roads and on federal-aid system)
10) Heavy commercial vehicle-miles of travel on the trunk highway system
11) 1995 population
12) 2020 population forecast
13) User fees, defined as regional estimates of state and federal motor fuels tax receipts and the state motor vehicle license tax receipts
14) Multiplier to reflect past funding

The existing target formula and 5 alternative scenarios were constructed and analyzed, and a new target formula was selected. It was based on a 40/60 split between system size and contribution measures (contribution measures were re-classified as present usage and future usage), as follows:

[18] STEP 21 Coalition. 1996. A Streamlined Transportation Efficiency Program for the 21st Century. Cited in Zemotel, Linda M. and Jon A. Bloom. 1997. Target Funding for Substate Transportation Investment Decisions, p. 8. Paper presented at 1997 Transportation Research Board Annual Meeting, Washington, DC.

[19] Zemotel, Linda M. and Jon A. Bloom. 1997. Target Funding for Substate Transportation Investment Decisions, p. 8. Paper presented at 1997 Transportation Research Board Annual Meeting, Washington, DC.

System Size			
	Federal-Aid Lane Miles		25%
	Bridge Area		10%
	Transit Vehicles		5%
		Subtotal	40%
Usage			
Present	Vehicle-Miles of Travel		25%
	Heavy Commercial Vehicle-Miles of Travel		5%
Future	2020 Population Forecasts		30%
		Subtotal	60%

Once this formula was agreed upon, it was recognized that it should be phased in, updated as data became available, reevaluated when major changes occurred, and applied to both state and federal target funding.[20]

An interesting analysis of transportation funding to metropolitan areas was contained in a recent Transportation Research Board (TRB) report on transportation issues in large cities.[21] In the section on financing, a chart is displayed comparing the percentage of 1995 capital transportation funds spent in urbanized areas in each state with the percentage of 1994 population in urbanized areas in each state (See Exhibit 1). In virtually every state (Delaware and DC are the exceptions), the percentage of transportation funding is less than the percentage of population of the urbanized areas. This is not surprising given that population is typically only one of several factors used by states to distribute transportation funds. Vehicle miles traveled, lane miles, and other performance-based measures are also used which tend to address imbalances for rural areas on the basis of system connectivity and coverage.

But the differences among the states in this analysis are noteworthy. In particular, Colorado is one of the states with the largest difference between percentage of funding to urbanized areas within the state and percentage of urbanized population. Among the 50 states, only New Hampshire and Indiana funded its urbanized areas less (in relation to population) than Colorado.

[20] Zemotel, Linda M. and Jon A. Bloom. 1997. Target Funding for Substate Transportation Investment Decisions, p. 18. Paper presented at 1997 Transportation Research Board Annual Meeting, Washington, DC.

[21] Transportation Research Board. 1998. Transportation Issues in Large U.S. Cities. Proceedings of a Conference, Detroit, Michigan, June 28-30, 1998.

Illustrative Analysis of Federal TEA-21 Funding Distribution to States

Based on the preceding reviews, it becomes clear that certain measures tend to be used frequently for the purpose of resource allocation and distributional equity analysis. Most formulas and analyses include the following three measures to one extent or another: 1) Population, 2) Lane-Miles, and 3) Vehicle-Miles Traveled (VMT). Each of these measures has strengths as well as weaknesses, and some combination of these should be considered when assessing distributions.

To illustrate how distributional analyses can change depending on which of these three measures is utilized, apportionment data from TEA-21 funding estimates will be analyzed. Figure 1 and Table 2 show the geographic distribution of apportionment estimates pursuant to TEA-21 as amended after redistribution and exclusive of the 2% of funds for statewide planning and research. As expected, larger states such as California, Texas, New York, Pennsylvania, and Florida received the largest total allocations from TEA-21, while smaller states (in terms of either area or population) such as Delaware, Vermont, Hawaii, New Hampshire, and Maine received the smallest allocations.

Figure 2 shows the TEA-21 funding distribution on a per capita basis. Here, states such as Alaska, Wyoming, Montana, North Dakota, and South Dakota emerge as the highest funded given their relatively low populations but large geographic areas to cover. States on the low end of the per capita scale include Minnesota, Illinois, California, New York, and Colorado. For California, New York, and Illinois, their very large population sizes help to explain why the per capita figures are low. For Minnesota and Colorado, the explanation is less clear. The 1996 Minnesota population of 4.64 million and Colorado's population of 3.81 million are in the mid-range among the states. Furthermore, both Minnesota and Colorado are relatively large states geographically, with large areas to cover. It would appear that these two states are receiving less from TEA-21 than would be expected on the basis of population and geographic area.

Another way to analyze the distribution is to consider vehicle miles traveled (VMT). Figure 3 shows 1995 VMT by state, while Figure 4 illustrates the TEA-21 funding distribution per VMT by state. California, Texas, Florida, New York, and Ohio are the largest VMT states, while Alaska, Vermont, North Dakota, and Rhode Island are the smallest. Funding distribution per VMT resembles the per capita distribution as states including Alaska, Montana, Wyoming, North Dakota, and South Dakota have high levels of funding per VMT, while California, Florida, Minnesota, Colorado, and Washington have low levels of funding per VMT.

An additional measure to consider is the number of lane-miles within each state. Figure 5 shows 1995 lane-miles by state, while Figure 6 displays the TEA-21 funding distribution per lane-mile by state. Texas has the largest number of lane miles by far among all the states with 626,417 compared to 2nd place California's 381,588. Other high lane-mile states include Illinois, Kansas, Minnesota, and Missouri. Low lane-mile states are Hawaii, Delaware, Rhode Island, Alaska, Vermont, and New Hampshire. Funding distribution per lane-mile shows that the small Eastern seaboard states such as

Rhode Island, Connecticut, New Jersey, and Delaware, as well as Alaska and Hawaii, have the highest shares of funding per lane-mile. There is a large area in the Great Plains, upper Midwest, and interior West that has lower shares of funding per lane mile.

As a way of providing a summary assessment of the TEA-21 funding distribution, Table 2 compares percentage shares of TEA-21 funding among the states with percentage shares of state population, VMT, and lane-miles. There are several states in which shares of TEA-21 funding exceed shares based on all three comparison measures, and there are a few states in which shares of TEA-21 funding are less than what is expected based on the three measures. States receiving substantially higher funding amounts in comparison to population, VMT, and lane-miles include Alaska, Indiana, Pennsylvania, and New Jersey. Other states receiving a greater share of funds in comparison to the three measures are Connecticut, Delaware, Georgia, Hawaii, Louisiana, Missouri, New Hampshire, Rhode Island, Vermont, and West Virginia.

There were only four states that received a lower share of TEA-21 funds than would be expected on the basis of comparison with population, VMT, and lane-miles: Minnesota, Colorado, Washington, and Tennessee. Minnesota received only 1.17% of TEA-21 funds compared to its 1.75% of U.S. population, 1.82% of VMT, and 3.28% of lane-miles. Colorado received 1.18% of TEA-21 funds compared to its 1.44% share of U.S. population, 1.45% of VMT, and 2.14% of lane-miles. Washington's TEA-21share was 1.83%, compared to 2.12% population, 2.03% VMT, and 2.02% lane-miles. Every other state had percentage shares of TEA-21 funding within the range of shares based on the three comparison measures.

Even though the TEA-21 legislation highlighted equity concerns, this analysis reveals noteworthy variations in federal spending among the states. Of course, the several caveats mentioned earlier must be considered when making equity assessments of any transportation funding distributions.

SUMMARY AND CONCLUSIONS

In their race to keep pace with rapid exponential growth, large metropolitan areas like Denver, Dallas-Ft.Worth, Phoenix and Seattle are grappling with the efficient and expedient allocation of fixed transportation revenues and resources. The inherent urgency is further fueled by pressures of chronic traffic congestion, air pollution, and other obvious indicia of overburdened transportation infrastructures. As though this requisite rapid-fire decision process is not onerous enough, a balancing of the respective equities of the potential recipients must be factored in.

As noted previously, this "transportation equity" imposes upon the distribution of transportation resources and costs process a concern for fairness to individuals and groups. Some of the relevant studies from the transportation equity literature were reviewed, revealing different kinds of equity: Procedural, geographic, and social equity were identified in one study, while horizontal, vertical (social class), and vertical

(mobility need) were defined in another. This study is principally concerned with horizontal geographic equity and horizontal procedural equity.

The Transportation Equity Act for the 21st Century (TEA-21) reflects increasing concern with the fairness of the distribution of transportation costs and benefits. Among other things, it sought to establish a minimum guaranteed amount of funding to each state equivalent to at least 90.5% of the transportation revenues each state paid to the federal government. Increasing concern with equity is also reflected by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) environmental justice policies that require MPOs to perform analyses regarding the extent to which transportation plans provide equal service to all neighborhoods, thus showing no evidence of any systematic patterns of negative bias toward certain neighborhoods or classes of people.[22]

Some important caveats to equity analysis were also identified, particularly the difficulties with geographic equity analysis. It is problematic to ascribe benefits to geographic areas solely on the basis of project distribution, because residents of other areas use those projects as well. This is particularly true at smaller scales of analysis, such as metropolitan areas. Previous studies illustrated the strengths and weaknesses of different equity measures, including population, vehicle miles traveled, and lane miles.

Results from other equity analyses and the analysis of TEA-21 funding distribution presented here illustrate some revealing findings. Colorado appears as one of the states that receives less than its "fair share" based on donor/donee analysis under ISTEA ($0.82 received per dollar contributed), and less in comparison with its share of population, vehicle miles traveled, or lane miles under the TEA-21 allocation. Furthermore, only 2 states funded their urbanized areas less in relation to urbanized area population than did Colorado based on data from a 1998 TRB report. Of the other states highlighted in this MPO study, Texas was identified as a donor state during the ISTEA funding period ($0.73 received per dollar contributed) but was within an equitable funding range under TEA-21. Washington's TEA-21 funding share was less than its share based on population, vehicle miles traveled, or lane-miles, but it was a donee state under ISTEA ($1.10 received per dollar contributed). Arizona was a donor state under ISTEA ($0.89 received per dollar contributed), but was within an equitable funding range under TEA-21. Thus, according to the analyses presented in this section, Colorado was the only one of the four states that received less than its "fair share" under both ISTEA and TEA-21.

[22] U.S. Department of Transportation, Federal Highway Administration. FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, Order 6640.23, December 2, 1998. Correspondence with Bruce McDowell, Intergovernmental Management Associates, November 17, 1999.