Equity in Transportation Planning: An Analysis of the Boston Region Metropolitan Planning Organization

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Equity in Transportation Planning: An Analysis of the Boston Region Metropolitan Planning Organization

Marcos Luna
Salem State University

This article presents an analysis of representational equity within the Boston Region Metropolitan Planning Organization (MPO). MPOs are regional transportation organizations that exert significant influence over state transportation planning and the allocation of funding. The analysis shows that under almost any voting or membership configuration, population representation is correlated with racial and ethnic composition. This outcome is not just a function of the system of representation but also the geography of residential segregation. The results of this analysis highlight the problem of creating systems of equitable representation within the context of preexisting and persistent social inequalities. **Key Words: equity, justice, planning, procedural equity, regional governance, representation, segregation, transportation.**

Metropolitan planning organizations (MPOs) are intergovernmental organizations that are responsible for regional surface transportation planning, policymaking, and implementation. Under federal transportation law, every metropolitan region in the United States with a population over 50,000 must designate or establish an MPO. MPOs are charged with both long-range planning (through a twenty- to thirty-year regional transportation plan) and short-term allocation of resources to specific projects (through a three-year transportation improvement program, or TIP; Mallett 2010). The decision-making powers of MPOs are sizable. They have a significant impact on investment, growth, and economic and social opportunity for residents of metropolitan regions (Sanchez 2006).

MPOs trace their origin to the 1960s and 1970s when Congress began to push the federal government and states to transform transportation planning to make it more cost-effective, more coordinated with local stakeholders, and more environmentally and socially benign. These changes were a response to growing dissatisfaction with the massive federal highway building program after World War II and the top-down decision making and autocentric focus of transportation planning and development. Suburban sprawl, depopulated central cities, housing segregation, disruption of communities bisected by highways, and environmental degradation were some of the more prominent flashpoints of resistance to transportation development at the time (Solof 1998).

Ensuing legislation over the last fifty years has elevated the role of MPOs, placing them at the forefront of efforts to promote regional governance and interjurisdictional coordination, multimodal transportation planning, and, especially, greater and more equitable participation by local stakeholders. With the landmark 1991 Intermodal Surface Transportation Efficiency Act, Congress raised the status of MPOs, opened up transportation planning to more stakeholders and interests, and mandated strengthened public involvement processes (Gage and McDowell 1995). The push for more inclusive public participation was further augmented in the late 1990s when the U.S. Department of Transportation (USDOT) and the U.S. Federal Highway Administration (USFHWA) issued Environmental Justice Orders in response to complaints that transportation planning programs were having disproportionate environmental and social impacts on poor and minority communities, as well as depriving those communities of equitable access to resources and benefits (USDOT 1997; Sanchez and...
Persistent Problems of Representation

Since at least the 1970s, analysts have raised concerns about the structure of formal representation on MPO governing boards. In most states, MPO governing boards are apportioned on a one-government, one-vote basis, which gives each municipality an equal say in MPO policy regardless of its population size (Lewis and Sprague 1997). The result is that a town of 1,000 has an equal say as a city of 1 million. This situation of MPO malapportionment—of population over- and underrepresentation—has been documented across the country. Benjamin, Kincaid, and McDowell (1994) used a 1993 USFHWA survey of MPOs in areas of 200,000 or more population and found almost universally disadvantageous voting arrangements for central cities on MPO policy boards. In sixty-eight out of the seventy-four cases studied, central cities were underrepresented. In only six cases were the cities overrepresented. Lewis (1998) used an index of deviation from proportionality to quantitatively represent the degree to which representation of the population is skewed in MPOs in California. He found that most MPOs exhibited a skewed representation such that jurisdictions with larger populations were underrepresented. Nelson et al. (2004) looked at information from twenty of the nation’s fifty largest MPOs and found similar results of malapportionment. Ensch (2008) looked at fifty MPOs across the nation and found that most exhibited disproportionate representation. The U.S. Advisory Commission on Intergovernmental Relations issued a report in 1997 that identified numerous problems with MPO organization, and argued for broader representation on MPO boards and specifically argued that MPOs should move toward weighted voting. Sanchez (2006) also found that MPOs across the country significantly underrepresent urban populations.

The equity implications of this structure of MPO representation are significant as a matter of fair process and outcome. Critics have raised concerns that biases in the process of representation are likely to lead to biased outcomes. This is most evident in the tension between urban and suburban transportation interests, which has often translated as the tension between highway and transit investments. Evidence suggests that the composition of MPO boards is associated with funding priorities. Research by Nelson et al. (2004) suggests that MPO board and voting structures have a significant effect on the outcomes of transportation investment decisions—especially those related to public transit. They found that the ratio of urban to suburban votes on MPO boards was correlated with the allocation of transportation funds between road and transit modes. In particular, they found that for each additional suburban voter on an MPO board, MPO investments were shifted 1 percent to 9 percent away from transit (and other modes) to highways. Ensch (2008) looked at fifty MPOs across the nation and found that the degree of disproportionality in MPO representation was strongly and negatively correlated with the MPOs’ allocation of funds to regional versus local projects. This would again work against transit investment, which would be particularly detrimental to inner-city urban communities.

The subtext of underrepresentation for inner-city urban interests in transportation planning is that it might mean a bias against minority and low-income communities. Nelson et al. (2004, 6) raised this particular concern, arguing that the system of one-area, one-vote “influences the level of public involvement and participation of persons based on residential location—and negatively so in the case of low-income neighborhoods of color in urban core areas.” Sanchez (2006, 6) made a similar point, suggesting that “Given the massive decentralization of white metropolitan residents in recent decades, a one-jurisdiction/one-vote structure may systematically disempower people of color.” To date, however, analyses of the representation imbalance of MPO boards have not directly analyzed the relationship of representation to race and ethnicity. This analysis does just that for the Boston Region MPO.

Background on Boston Region MPO

The Boston Region MPO was established in 1973 and includes 101 cities and towns in eastern Massachusetts, predominantly within a radius of approximately 32 km (20 miles) from the city of Boston. It encompasses approximately 3,639 km² (1,405 square miles). The MPO region is further subdivided into eight subregions (Figure 1). The diverse communities in the MPO area range from relatively rural communities to the urban centers of Boston, Cambridge, and Somerville.

In July 2011, the Boston MPO approved a Memorandum of Understanding that included a new voting structure (Boston Region MPO 2011). Under this new structure, the Boston MPO has twenty-two voting member seats. Eight of the seats are permanent voting member seats for designated state and regional entities. Two of the seats are permanent voting member seats for the City of Boston. Twelve of the seats...
are municipal member seats that require election. Of those twelve elected municipal member seats, there is one municipal seat to represent each of the eight Metropolitan Area Planning Council (MAPC) subregions and four at-large municipal seats (two at-large seats for cities and two at-large seats for towns). The allocation of seats for subregions and at-large municipalities is not population weighted (Figure 2).

Each of the twelve municipalities that are elected to a voting seat, whether representing a subregion or at-large, is chosen by a vote of the 101 cities and towns that make up the MPO region. Each of the 101 cities and towns has one vote for each of the municipal seats. The allocation of one vote to each municipality to vote for each open seat is not population weighted.

This analysis seeks to answer the following questions: How representative is this MPO voting structure? Does this MPO voting structure result in systematic over- or underrepresentation for communities with different population sizes? Is MPO representation correlated with the racial or ethnic composition of member communities?

**Analysis of Boston Region MPO Representation**

A common way to assess the representation of MPO boards is to compare the proportions of total votes represented by each MPO member who represents a jurisdiction (i.e., municipality or subregion), here referred to as vote share.

\[
\text{Vote share} = \frac{\text{Number of votes of member jurisdiction}}{\text{Total number of votes of all member jurisdictions}}
\]

Vote share provides the relative per jurisdiction weight of each member’s vote in a one-government, one-vote system. The per jurisdiction weight, or vote share, is in contrast to the population share. The population share of a board member is the proportion of the total MPO population represented by a given jurisdiction:

\[
\text{Population share} = \frac{\text{Population of member jurisdiction}}{\text{Total population of MPO}}
\]

The latter is a measure of per capita voting weight. Differences between the vote share and population share indicate an imbalance, or malapportionment, of resident representation (Lewis 1998; Sanchez 2006).

The relationship between vote share and population share can be further simplified by calculating a ratio of vote share to population share, here referred to as the
Figure 2  Organization chart for membership seats of the Boston Region Metropolitan Planning Organization (MPO).

A truly equitable situation is one in which vote share is equal to the population share. In the representation ratio, a value of 1 indicates a balance between vote share and population share. Values below 1 indicate a situation of underrepresentation (i.e., vote share less than population share), whereas values above 1 indicate overrepresentation.

Table 1 shows the summary statistics for the Boston MPO subregions. The Inner Core Communities (ICC) subregion is by far the most populous

<table>
<thead>
<tr>
<th>Subregion</th>
<th>TotalPop</th>
<th>WhitePop</th>
<th>PopShare</th>
<th>PctWhite (%)</th>
<th>Votes</th>
<th>VoteShare</th>
<th>VoteDiff</th>
<th>RepRatio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICC</td>
<td>1,009,847</td>
<td>677,034</td>
<td>0.32</td>
<td>67</td>
<td>1</td>
<td>0.1</td>
<td>-0.22</td>
<td>0.32</td>
</tr>
<tr>
<td>Boston</td>
<td>617,594</td>
<td>290,312</td>
<td>0.19</td>
<td>47</td>
<td>2</td>
<td>0.2</td>
<td>0.01</td>
<td>1.03</td>
</tr>
<tr>
<td>MAGIC</td>
<td>167,755</td>
<td>140,471</td>
<td>0.05</td>
<td>84</td>
<td>1</td>
<td>0.1</td>
<td>0.05</td>
<td>1.90</td>
</tr>
<tr>
<td>MetroWest</td>
<td>231,967</td>
<td>179,883</td>
<td>0.07</td>
<td>78</td>
<td>1</td>
<td>0.1</td>
<td>0.03</td>
<td>1.38</td>
</tr>
<tr>
<td>NSFT</td>
<td>280,858</td>
<td>252,054</td>
<td>0.09</td>
<td>90</td>
<td>1</td>
<td>0.1</td>
<td>0.01</td>
<td>1.14</td>
</tr>
<tr>
<td>NSPC</td>
<td>203,921</td>
<td>179,722</td>
<td>0.06</td>
<td>88</td>
<td>1</td>
<td>0.1</td>
<td>0.04</td>
<td>1.57</td>
</tr>
<tr>
<td>SSC</td>
<td>258,305</td>
<td>236,878</td>
<td>0.08</td>
<td>92</td>
<td>1</td>
<td>0.1</td>
<td>0.02</td>
<td>1.24</td>
</tr>
<tr>
<td>SWAP</td>
<td>143,424</td>
<td>128,919</td>
<td>0.04</td>
<td>90</td>
<td>1</td>
<td>0.1</td>
<td>0.06</td>
<td>2.23</td>
</tr>
<tr>
<td>TRIC</td>
<td>280,633</td>
<td>223,909</td>
<td>0.09</td>
<td>80</td>
<td>1</td>
<td>0.1</td>
<td>0.01</td>
<td>1.14</td>
</tr>
</tbody>
</table>

Note: Although the City of Boston is technically part of the Inner Core Communities (ICC) subregion, it is treated here as a separate subregion because the city enjoys two permanent seats on the MPO board and is therefore always represented, similar to the subregions. TotalPop is the total population of each MPO subregion (based on 2010 U.S. Census). WhitePop is the total number of non-Hispanic white residents of each subregion. PopShare is the subregion's proportion of the total population within the MPO, which was 3,194,304 in 2010 (proportions do not add up to 1 due to rounding). PctWhite is the percentage of residents within each subregion who are non-Hispanic white. Votes is the number of votes of seats, that each subregion enjoys on the MPO board. VoteShare is the subregion's proportion of the total number of votes among the subregions. The total number of votes here does not include votes enjoyed by at-large municipalities or state and regional entities on the MPO board. VoteDiff is the difference between each subregion's VoteShare and PopShare. RepRatio is representation ratio, which is the ratio of each subregiun's vote share to population share. A value of 1 indicates a balance between voting share and population share—equitable representation. Values below 1 indicate underrepresentation, and values over 1 indicate overrepresentation. MAGIC = Minuteman Advisory Group on Interlocal Coordination; NSFT = North Shore Task Force; NSPC = North Suburban Planning Council; SSC = South Shore Coalition; SWAP = Southwest Advisory Planning Committee; TRIC = Three Rivers Interlocal Council.
subregion, encompassing one third of the MPO’s total population. The City of Boston follows closely behind with 20 percent of the MPO population. Except for Boston with its two permanent seats, each of the subregions represents a single vote on the MPO board. Because of its size and permanent seat status, Boston is treated here as a separate subregion. Assuming a total of ten votes among the subregion seats, the vote share of each subregion ranges from 0.1 to 0.2 (for Boston). This vote share differs significantly from the population shares. The imbalance of representation is more evident in the column of representation ratios. Only Boston approaches equitable representation. The ICC, which is part of the inner urban region, is dramatically underrepresented. By contrast, all of the suburban subregions are overrepresented. As described earlier, the underrepresentation of urban core communities is not uncommon. Figure 3 shows an inverse relationship between population share and representation ratio. This is not surprising because population share is the denominator in the representation ratio and necessarily decreases the ratio as population share increases.

More disturbing is the relationship of representation to race and ethnicity, evident in Table 1 and in Figure 4. These suggest a positive relationship between representation ratio and the proportion of white residents of a given subregion. Thus far, however, the analysis has not taken into account the at-large municipal seats.

**At-Large MPO Seats**

An analysis of the equity of MPO seat allocation is complicated by the at-large municipal seats. Of the twelve elected municipal member seats (excluding the two permanent seats for Boston), there is one municipal seat for each of the eight subregions and four at-large municipal seats (two at-large seats for cities and two at-large seats for towns). Although subregion municipal seats can be reasonably expected to represent the subregion to which they belong, it is not clear how at-large municipal seats should be treated. Do at-large municipal seats represent only themselves? Do they represent the subregions to which they belong? Or do they represent all cities and towns within the MPO region? The answer to this question affects how their representation ratios are calculated and thus the equity implications of the MPO seat allocation.
The role and impact of at-large seats is ambiguous (Welch 1990). In previous analyses of MPO representation, Lewis (1998) and Goetz, Dempsey, and Larson (2002) suggested that the addition of at-large seats to MPO boards could be one way of mitigating malapportionment, although neither elaborated. Sanchez (2006) explicitly excluded consideration of “nonlocal” votes in his analysis of representation between urban and suburban communities but suggested that future studies should take this into account to explore the impact on MPO representation. Other research suggests that municipal representatives, regardless of their MPO role, are likely to favor parochial interests over regional interests. This is especially the case when MPO municipal representatives are elected officials who feel accountable to their municipal electorate (Gerber and Gibson 2009). Francois (1995, 10) expressed this point very bluntly: “I can assure you from my 14 years’ participation on an MPO board that it is very difficult to take a regional viewpoint on an issue that may hurt your own city or county.” Indeed, the latter perspective is consistent with the observations of transportation advocates that work with the Boston MPO (Wig Zamore, Somerville Transportation Equity Partnership [STEP], personal communication with author, 12 December 2011). For the purposes of this analysis, I assume that municipalities occupying the at-large seats represent only their own residents.

Assuming At-Large Municipal Seats Represent Only Themselves

If we assume that each of the four at-large municipal seats represents its only its own residents, representation ratios become quite large because the populations of any at-large municipality will be very small relative to the population of the MPO as a whole. If each at-large municipal seat represents only its own resident population, representation ratios for the at-large seats can range from a low of 2.15 to a high of over 66. The strong inverse relationship between representation and population proportion holds true across the full range of at-large city and town population sizes (Figures 5 and 6). Indeed, it appears exponential if the
at-large seats are occupied by municipalities with the smallest populations.

The impact of the possible representation scenarios on racial equity is more variable. If the at-large seats are occupied by cities and towns with the highest white population proportions (i.e., greater than 91 percent), there is a strong positive correlation between proportion white and the representation ratio and this correlation is statistically significant (Table 2 and Figure 7). In this scenario, increases in representation ratio are strongly explained by increases in the proportion of the population that is white. This scenario would thus indicate a strong racial disparity. If, on the other hand, the at-large seats are occupied by the cities and towns with the lowest white population proportions (i.e., less than 66 percent), the relationship is flipped and there is a slight inverse correlation between percentage white and the representation ratio, although this correlation is weaker and not statistically significant (see Table 2 and Figure 8).

This variation in outcomes indicates that the relationship between voting power and race is sensitive to the outcome of elections for at-large municipal seats. Under at least one scenario, there would be a racial disparity in MPO board representation. The question is this: How likely is it that these seats will be occupied by cities and towns with a combination of representation ratio and racial composition such that a racial disparity becomes evident?

The number of possible combinations of elected municipalities to the at-large seats is large. In the Boston MPO there are seventy-eight towns and twenty-two cities that are eligible for the four at-large seats in any given election cycle, excluding Boston. The number of possible combinations can be calculated using a standard combinatorial formula:

\[ C(n, r) = \frac{n!}{(r!(n - r)!)} \]

where \( n \) is the total number of possibilities to start and \( r \) is the number of selections made. \( C(n,r) \) is the number of ways a sample of \( r \) elements can be obtained from \( n \) distinguishable objects where order does not count and repetitions are not allowed (Zwillinger 2003). In the case of the two at-large town seats, \( n = 78 \) and \( r = 2 \), yielding 3,003 possible combinations. The possible number of combinations for the two at-large city seats is calculated similarly, where \( n = 22 \) and \( r = 2 \), yielding 231 possible combinations. The total number of possible combinations for the four at-large seats is simply the product of the two combinations. Therefore, there are 693,693 possible combinations for the four at-large seats.

To analyze statistical association when there are so many possible combinations, a bootstrap method can be used to calculate the statistic of interest with confidence intervals. In this case, the statistic of interest is the Spearman rank correlation coefficient between the representation ratio and race. The Spearman rank correlation between proportion white and representation ratio is statistically significant (Table 2 and Figure 7). Under this at-large scenario, there is a positive and statistically significant relationship between proportion white and the representation ratio and this correlation is strongly explained by increases in the proportion of the population that is white. This scenario would thus indicate a strong racial disparity.
correlation coefficient is a nonparametric measure of statistical dependence between two variables. This method of measuring correlation is appropriate in situations where it is not known if the population distribution is normal, and it is robust in situations where the association between the variables might be nonlinear.

In the bootstrap method, repeated samples are drawn from the population of interest a large number of times—usually 1,000 or more. Each time the sample is drawn, the statistic of interest is computed and stored. A histogram of the set of these computed values provides the bootstrap distribution of the statistic. The sheer size of repeated sampling provides a robust estimate of the true sampling distribution of the statistic, allowing computation of reliable confidence intervals. Indeed, for nonparametric statistics (e.g., medians) and correlations, the bootstrap method is often simpler and superior to theoretically based approaches of statistical inference (Singh and Xie 2008).

For this analysis, bootstrap computation of the Spearman’s rank correlation coefficient was performed in the statistical package R (R Core Team 2012). A sampling function drew a random sample of two cities and two towns, without replacement. These samples were then combined with the table of data for the eight subregions and Boston, and the Spearman’s rank correlation coefficient between representation ratio and race was computed. This process was repeated 10,000 times, each time with a new random sample of two towns and two cities.

Figure 9 shows a histogram of the bootstrapped statistics. To assess the statistical significance of this distribution, the 2.5th and 97.5th percentiles are computed, which form the limits of the 95 percent confidence interval. These limits, along with the median, are indicated by dotted lines on the histogram. If the confidence interval does not cross zero, then it is safe to conclude that the statistic is significant. In this case, 95 percent of the bootstrapped Spearman rank correlation coefficient values fall between 0.04 and 0.69. This indicates that under almost any possible scenario, there is likely to be a positive and statistically significant correlation between representation on the MPO and the proportion of non-Hispanic white residents. In short, the bootstrap analysis shows a consistent correlation between race and representation on the Boston MPO regardless of the member composition.

### Municipal Analysis of MPO Voting Structure

Thus far this analysis has looked at the structure of representation on the Boston MPO board itself. A second question about the equity of representation concerns the manner in which MPO municipal board representatives can be elected. Under the 2011 MOU, all municipalities in the Boston MPO region vote for all open municipal seats on the MPO. The Boston MPO region consists of 101 municipalities. Each of the 101 communities may cast votes for twelve out of the fourteen municipal representatives on the MPO. Every municipality votes for

- Eight municipalities, one municipality to represent each of the eight subregional seats.
- Two towns for the at-large town seats.
- Two cities for the at-large city seats.

Each municipality can thus cast up to twelve votes to fill twelve out of fourteen municipal seats on the MPO (excluding Boston’s two permanent seats). Under this structure, each municipality therefore enjoys slightly less than a 0.01 voting share. This voting share allocation is inequitable when compared to population distributions among the municipalities. Although Boston maintains two permanent seats on the MPO, it is still radically underrepresented. Boston holds nearly 20 percent of the MPO’s population, but its voting share is less than 1 percent. In fact, three quarters of the ICC are among the underrepresented municipalities (i.e., voting share less than population share), although the ICC represents less than one fifth of all municipalities.
in the MPO. In addition, although only one quarter of all municipalities in the Boston MPO are underrepresented (i.e., representation ratio less than 1), the ICC makes up more than half of all the underrepresented communities. As with the subregions, this disparity in representation among municipalities can be understood as an inverse relationship between population size and the representation ratio. As a municipality’s population decreases, its representation ratio increases (Figure 10). The representation ratio among the 101 municipalities ranges from a low of 0.05 (Boston) to a high of 9.18 (Nahant; see Table 3).

As Figure 11 shows, the representation ratio for a municipality increases as the proportion of non-Hispanic white residents in the municipality increases. There is a positive correlation of 0.63 between representation and proportion white. Race is a strong predictor of representation for municipalities across the Boston MPO region.

The relationships among municipal population size, racial and ethnic composition, and relative representation are apparent in the geographic distribution of the population within the Boston MPO. Figure 12 shows the distribution of population percentages (i.e., percentage of the MPO population within a given municipality) and the distribution of representation ratios by municipality in the Boston MPO. Figure 13 shows the distribution of percentage white and the distribution of representation ratio by municipality in the

<table>
<thead>
<tr>
<th>Municipality</th>
<th>TotalPop</th>
<th>RepRatio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>617,594</td>
<td>0.050</td>
</tr>
<tr>
<td>Cambridge</td>
<td>105,162</td>
<td>0.295</td>
</tr>
<tr>
<td>Quincy</td>
<td>92,271</td>
<td>0.336</td>
</tr>
<tr>
<td>Lynn</td>
<td>90,329</td>
<td>0.343</td>
</tr>
<tr>
<td>Newton</td>
<td>85,146</td>
<td>0.364</td>
</tr>
<tr>
<td>Wenham</td>
<td>4,875</td>
<td>6.362</td>
</tr>
<tr>
<td>Carlisle</td>
<td>4,852</td>
<td>6.392</td>
</tr>
<tr>
<td>Sherborn</td>
<td>4,119</td>
<td>7.529</td>
</tr>
<tr>
<td>Essex</td>
<td>3,504</td>
<td>8.851</td>
</tr>
<tr>
<td>Nahant</td>
<td>3,410</td>
<td>9.095</td>
</tr>
</tbody>
</table>

Note: TotalPop is the total population of each municipality. RepRatio is representation ratio, which is the ratio of each municipality’s vote share for electing metropolitan planning organization board members to its population share. A value of 1 indicates a balance between voting share and population share—equitable representation. Values below 1 indicate underrepresentation, and values over 1 indicate overrepresentation.
Equity in Transportation Planning

Figure 10  Population proportion versus representation ratio by municipality. This graph shows the 101 municipalities within the metropolitan planning organization (MPO) that can vote to elect subregion or at-large municipal representatives to the MPO board. Population proportion is the municipality’s proportion of the total population within the MPO. Representation ratio is the ratio of each municipality’s vote share to population share. A value of 1 indicates a balance between voting share and population share—equitable representation. Values below 1 indicate underrepresentation, and values over 1 indicate overrepresentation.

Discussion and Conclusion

The MPO representation system of one government, one vote has been repeatedly criticized for creating situations of underrepresentation for more populous municipalities, and especially for inner urban core communities. Critics have suggested that such systems could prove particularly disadvantageous to racial minorities. However, the relationship between representation and race within MPOs had not been directly evaluated. This article has provided that direct analysis of representation and race for the Boston Region MPO.

This analysis has shown that the representation system within the Boston MPO violates basic principles of fairness in representation. Specifically, the representation structure of one government, one vote creates a strong and consistent relationship between relative representation and race and ethnicity, such that communities and subregions with higher proportions of non-Hispanic white residents are consistently overrepresented and, conversely, communities and subregions with higher proportions of non-whites are underrepresented. This voting structure is thus unrepresentative and racially biased, and it introduces the potential for bias in decision making. Previous research has shown that the composition of MPO boards can affect transportation decision outcomes, particularly when there is a divergence between parochial and regional interests, such as those over transit.

In the Boston metro region, transportation equity advocates have voiced real concern about the fairness and the material consequences of biased representation in transportation programming and policy (Benson 2010). Declining revenue, escalating costs, and the crippling burden of debt servicing for past highway infrastructure investments (now 30 percent of the Massachusetts Department of Transportation’s budget) have raised the stakes for regional and state transportation policy and decision making (Transportation for Massachusetts 2011). There are also inherent tensions in transportation interests between the urban core and outlying suburban communities, between commuter rail and bus riders, and between auto-dependent and transit-dependent households. These potentially antagonistic interests intersect with persistent residential segregation, raising the possibility of a geographical divide between suburban and urban communities and between majority white and non-white communities.

The problem that the current structure for representation in the Boston MPO presents is that, although one government, one vote appears to be nominally race-neutral, it nevertheless encounters the specific context of the Boston metropolitan region’s de facto community segregation by race and ethnicity.

Figure 11  Proportion white versus representation ratio by municipality. This graph shows the 101 municipalities within the metropolitan planning organization (MPO) that can vote to elect subregion or at-large municipal representatives to the MPO board. Proportion white is the proportion of residents within each municipality who are non-Hispanic white. Representation ratio is the ratio of each municipality’s vote share to population share. A value of 1 indicates a balance between voting share and population share—equitable representation. Values below 1 indicate underrepresentation, and values over 1 indicate overrepresentation.
As this analysis has shown, and as clearly illustrated in Figure 13, the Boston metro region is characterized by a distinct geographic pattern of residential segregation that also coincides with population size. Indeed, over the past three decades the Boston metro region has consistently ranked as one of the top metropolitan areas showing a high degree of residential segregation (Iceland, Weinberg, and Steinmetz 2002; Logan and Stults 2011). Sanchez (2006, 14) argued that “because racial and ethnic representation is implicit to geographic representation, racial and ethnic minorities continue to struggle for acceptable representation on transportation boards and commissions.” Indeed, the pattern of residential segregation in the Boston MPO is to such a degree that almost any membership or voting configuration under the one government, one vote system results in both underrepresentation of more populous municipalities and a racial bias.

It is unlikely that this situation is unique to the Boston Region MPO. Researchers have repeatedly and consistently found a suburban bias in MPO representation and investment choices across the country. The research presented here extends this body of work, showing that this bias also extends along the fault lines of race and ethnic composition. Indeed, there might be other demographic characteristics that intersect with these urban–suburban biases, such as class or income. This research suggests that such inequities might be playing out similarly in other MPOs across the country, depending on how their representation structures are designed and how these structures intersect with residential geography.

This analysis has not considered the role or importance of the state and regional entities that hold permanent seats on the Boston Region MPO board (i.e., Massachusetts Bay Transportation Authority, MassDOT, Regional Transportation Advisory Council). It is less clear how to assess their potential geographic, constituent, or programmatic allegiances or biases. The relative representation of state or regional versus local stakeholders in transportation planning, however, has been central to historic debates about regional governance and representation, and therefore deserves closer scrutiny.

A lot of effort has gone into trying to understand and construct processes for representation or participation that are fair and equitable, but it is clear that the specific context of specific places or regions matters. Thus, the fairness and justice of processes should not be evaluated outside of their context. To evaluate a process apart from its context risks perpetuating, or possibly even exacerbating, structures of inequity. In
Figure 13  Maps of Boston Region Metropolitan Planning Organization (MPO) municipal white percentages and representation ratios compared. Percent White is the percentage of a municipality’s residents who are non-Hispanic white. Rep Ratio is representation ratio, which is the ratio of each municipality’s vote share to population share. A value of 1 indicates a balance between voting share and population share—equitable representation. Values below 1 indicate underrepresentation, and values over 1 indicate overrepresentation. The map on the left shows that a municipality’s proportion of residents who are white is lowest in Boston and urban core communities and increases rapidly moving outward from the core to the suburbs. The map on the right shows a parallel pattern for representation ratio; relative representation is lowest in the urban core and increases toward the outer suburbs. (Color figure available online.)

In this case, a structure of one government, one vote can only build on de facto inequalities because it intersects with on-the-ground community segregation between white and nonwhite communities. This is what social justice theorists Fraser (1997) and Shrader-Frechette (2002) have identified as the context of social justice. The problem of ostensibly neutral processes is that they inevitably exist within a social and historical context in which de facto inequalities and inequities are present. Processes that exacerbate or simply perpetuate inequities cannot be judged as procedurally just (Haney 1991; MacCoun 2005). Clearly “neutral” processes are not necessarily neutral in all situations, and context (and geography) matters.

In the same way that agencies have developed screening criteria for disproportionate impacts of projects on sensitive populations, it is possible to vet the fairness of processes. In a review of nearly thirty years of research on conceptions of procedural justice, Tyler (2000) identified four primary factors that contribute to assessments of the fairness of processes: opportunities for participation (voice), the neutrality of the forum, the trustworthiness of the authorities, and the degree to which people receive treatment with dignity and respect. These findings complement the arguments of social justice theorists. Notably, representation and participation stand out as core components of procedural justice, a way of assessing the fairness of institutional processes and the behavior of authorities. Thus, processes can be evaluated a priori for their fairness by considering how they adhere to procedurally just qualities and with respect to protected classes (e.g., racial and ethnic minorities, gender) or vulnerable populations (e.g., children, elderly, and the disabled). This analysis has shown that the Boston Region MPO’s process of representation intersects with the residential segregation to create or exacerbate a situation of procedural inequity for representation and participation in transportation planning. This situation is one that is measurable, and it is one that can be addressed.

Literature Cited


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