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# Community-Based Advocacy at the Intersection of Public Health and Transportation: The Challenges of Addressing Local Health Impacts within a Regional Policy Process

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## Abstract

Integrating public health concerns into transportation policy agendas involves addressing the negative impacts of traffic on neighboring communities. Through interviews, focus groups, and participatory photo-mapping, we studied one community that advocated to improve community health through the design and reconstruction of an arterial road in their neighborhood. The transportation planning process provided an opportunity for neighbors' participation, but it prioritized solving regional transportation problems instead of local impacts. The uneven adoption of public health concerns in this case was related to the constraints of regional planning and governance. Integrating health and transportation issues locally requires action at multiple scales.

## Keywords

arterial roads, health disparities, neighborhoods, public health, transportation

## A Transportation Planning Perspective on Health in All Policies

Public health outcomes cannot improve through health care and surveillance alone because health outcomes also depend on social, economic, and environmental determinants. These socioeconomic and environmental determinants are influenced by social policies outside the health sector. For this reason, health policy experts have urged governments to link public health concerns to other policy agendas, which has resulted in burgeoning health-in-all-policies efforts. Thus, taking a comprehensive approach to health is both a technical and political endeavor that requires “understanding . . . the political agendas and administrative imperatives of other sectors” as well as “building the knowledge and evidence base of [multi-sectoral] policy options and strategies” (World Health Organization 2010, 1; 1988).

Transportation is one policy arena to which public health concerns have been added. Air quality and safety have been mainstream issues at the intersection of public health and transportation for decades. Yet, professionals involved in transportation policy change around public health worry that transportation policy agendas have adopted health concerns unevenly. In particular, localized air quality problems and the safety of vulnerable populations have received relatively less attention compared to mainstream air quality and safety (Dannenberg et al. 2014).

The lack of attention to localized problems and vulnerable groups is the more general problem facing the integration of public health and planning. A persistent gap exists between these two disciplines, and Corburn (2004) has argued that an environmental justice agenda that prioritizes addressing health disparities could bridge this gap.

Bridging this gap requires focusing on the community-level advocacy work of environmental justice and grassroots transportation groups, but challenges remain to introducing this focus into transportation policy. For example, Deakin (2007) contrasted the mainstream policy agendas of regional transportation agencies and the agendas of environmental justice groups in the San Francisco Bay Area and found that “not a single one of [the mainstream] issues or investment proposals was listed in the top five by any of the [environmental justice] groups or interview respondents.” Mainstream regional agendas focused on reducing traffic congestion and

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sprawl with highway and transit investments, whereas environmental justice agendas focused on problems of limited transit service at night, the high cost of car ownership and transit fares, pedestrian safety, and the noise, emissions, and traffic problems in neighborhoods.

These patterns suggest a strategy, which was the basis for this research: We need to examine both how community-based advocacy around public health issues successfully shapes mainstream transportation policy agendas, as well as what factors prevent these public health concerns from becoming salient for transportation planning and policy in cities, regions, states, and at the federal level. This focus on community advocacy is necessary because communities' concerns often highlight transportation's role in creating and maintaining health disparities as well as better practices for including communities in decision making.

We used a case study research design and combined two main sources of data. The case is a community that took a comprehensive approach to public health and advocated to include health concerns in the design and reconstruction of an arterial highway that passes through the neighborhood. Main sources of data included (1) participatory photo-mapping and focus groups with residents to learn how the neighborhood transportation environment shaped the community's public health concerns and (2) interviews with neighbors, planners, elected officials, and other participants in the arterial planning process.

This research resulted in two main findings. First, the photo mapping and focus groups demonstrated that communities have a comprehensive understanding of how the transportation system affects community health. The community viewed the arterial road as a critical part of their neighborhood, and the neighbors' primary concerns included (1) accessibility barriers that prevent neighbors from carrying out daily activities; (2) direct exposure to hazards such as traffic, noise, and emissions; and (3) blight that exacerbates signs of social disorder.

The photo-mapping succeeded in showing the neighbors' lived experience of the transportation system, but the methodology's focus on the neighborhood did not reveal the entire story. Interviews, community meetings, and other documents (e.g., neighborhood association newsletters) demonstrated that neighbors who advocated to address the community's public health concerns inevitably engaged with issues well beyond the neighborhood scale. Furthermore, these neighbors worked within a planning process designed to solve regional transportation problems, and they were well aware of this process and its constraints.

The second main finding, developed through analysis of interviews with stakeholders, is that regional planning and growth politics affected community-based groups' ability to bring local public health concerns into the planning process in two major ways. First, federal and state transportation planning requirements, particularly those associated with environmental impact assessment, controlled the

forum for public participation, and constrained the types of concerns that could be discussed in the forum (e.g., housing and community revitalization issues related to the arterial were not within the scope of the official process). Second, regional transportation problems trumped local concerns in the decision-making processes for the arterial's design (a process that includes input from elected officials, municipality and county staff members, project planners and consultants, etc.) because the local concerns did not have sufficient political support. Although the neighbors achieved some incremental design changes through this process, the broader issue of the negative impacts of traffic on the local community was not incorporated into the reconstruction project.

This research points to a need and opportunity for public health advocates to develop intergovernmental and interscalar strategies to create a flexible framing for "local" issues. The typical planning processes for neighborhoods, corridors, and projects may come too late in the process to have the power to reframe debates about local-regional development conflicts. In a regional transportation-planning context shaped by state and federal policy, as well as regional collaboration, the power to change transportation outcomes is often upstream of local impacts. Therefore, we should look for ways to broaden the policy communities working on transportation and public health to include actors involved in multiple scales of action. We also need to strengthen transportation and land use planning techniques (e.g., modeling, public participation) to represent and relate local and regional scales in combination.

### **Analytical Approach to Observing the Effects of Community-Based Advocacy on Transportation Policy Agendas**

This research did not seek to test any specific model of policy change. Instead, our work was exploratory and focused on understanding the role of community-based advocacy in advancing public health concerns in the context of transportation planning, which we hypothesize is one pathway to transportation policy change. There are numerous theories about how and why policy agendas change, including punctuated equilibrium, policy windows, advocacy coalitions, collaborative planning, policy learning, and social movements. In general, these theories have a common analytical focus at the scale of policy subsystems, and they lead to questions such as (1) who are the actors in the decision-making process; (2) what is the discursive meaning and framing of the policy; (3) in what institutional venues does policy discourse occur; and (4) what kinds of interactions happen (e.g., conflict, mutual learning) (Baumgartner and Jones 1993). These were the questions that guided our research design, methods, and analysis. In our case, the policy in question is the reconstruction of the arterial, Verona Road.

Studies of policy change specifically in the transportation sector have considered a variety of settings. Kingdon's study (1984) of national transportation legislation examined the agenda-setting dynamics in a "primeval soup" of actors, agendas, and alternatives seeking "policy windows." Yet, observing national-level policy change is incomplete because transportation problems are functionally related to state and local policy (e.g., land use controls), and because "reform opponents can use competing decision-making arenas to undermine change" (Weir, Rongerude, and Ansell 2009, 478).

We would expect to see *community-based* policy networks active in environmental justice advocacy because of local groups' and some governments' ambitions to democratize policy making, and because implementation is a site of politics. Thus, an analysis of policy change in transportation, public health, and environmental justice needs to account for actors with a stake in project-level politics as well as elite policy communities that inform legislation and planning.

Finally, the techniques and methods of policy making, including public participation practices, are also a potential site for change. When agendas change, their metrics, data, methods, models, and ongoing monitoring change too (Handy 2008).

### **The Arterial Roads Problem at the Intersection of Public Health, Transportation, and Environmental Justice Planning**

To observe the process of including health in transportation policy, we selected arterial roads as the empirical site for this research. Arterial roads were a strategic choice for this research because of their design and function in the transportation system, their disproportionate effects on environmental justice communities, their contribution to health disparities, the opportunity to redesign them, and their institutional complexity.

Arterials are the wide, multilane roads designed to carry fast, high-volume traffic through cities and suburbs, and they are a critical piece of the urban transportation system. Their design is based on modified highway standards to optimize traffic flow and accommodate heavy trucks, and it is not uncommon for them to carry an average of 40,000 vehicles per day at speeds around 40 miles per hour (safe speeds for pedestrians are in the range of 15 miles per hour) (Transportation Research Board 2010, 14-1; Tefft 2011, 12). Countries throughout the world include arterials in the functional hierarchy of streets (i.e., local, collector, arterial), and the United States exemplifies the complicated relationship arterials have to surrounding land uses. Instead of providing only mobility for high-speed traffic, we depend on urban arterials for access to commercial strips and residential subdivisions, and this conflict between access and mobility has become a marker of auto-oriented urban design.

In the discourse about environmental justice, arterials are called out because they concentrate negative externalities such as noise, air pollution, and traffic hazards in disadvantaged neighborhoods. The public health effects of heavy traffic are broad. Studies have found associations between high-traffic roads and higher mortality rates (Roemer and van Wijnen 2001), lung cancer (Nyberg et al. 2000; Brunekreef and Holgate 2002), cardiovascular disease (Miller et al. 2007), respiratory disease and asthma (Oosterlee et al. 1996), poor birth outcomes (Brauer et al. 2008), and traffic-related injury (Morency et al. 2012). With respect to arterial roads in particular, a study of New York City found that its arterial roads account for only 15 percent of the road network but 60 percent of pedestrian fatalities (New York City Department of Transportation 2010, 22).

An important aspect of the environmental justice framing of arterials is that people who live closest to them experience their negative externalities more acutely than others who live farther away (Roemer and van Wijnen 2001; Wilhelm and Ritz 2003; McConnell et al. 2006). These neighbors are also more likely to be poor and nonwhite (Morello-Frosch, Pastor, and Sadd 2001; Gunier et al. 2003; Houston et al. 2004). In this way, arterial roads not only contribute to public health burdens but to inequality too. This implies that a transportation and land use planning practice oriented toward reducing health disparities and environmental injustice requires paying special attention to arterial roads.

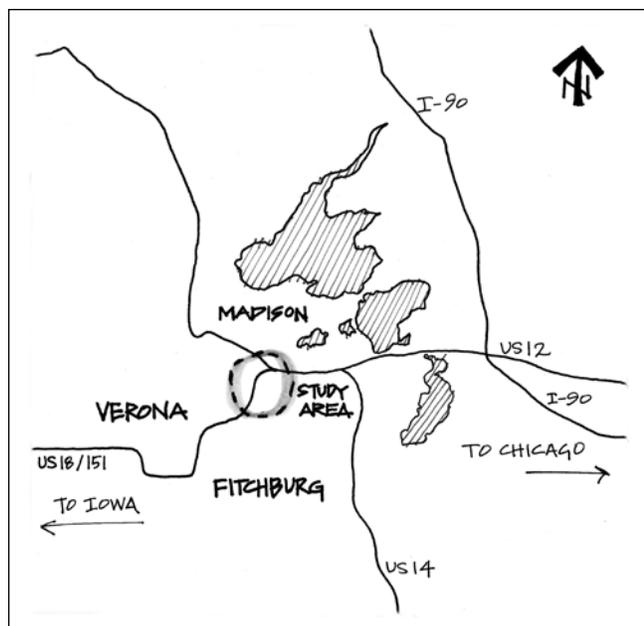
Urban arterial roads warrant more attention for the reasons discussed above, and because they are reasonable targets for adaptation and change. Within a transportation planning and engineering context, they are commonly redesigned to optimize (increase) traffic flow, improve safety, and facilitate transit service.

A final motivation for our focus on arterials is that they are institutionally complex. Multiple groups have a stake in their design and function, including transit agencies that rely on them as trunk routes, freight carriers moving goods, property owners seeking the value of accessibility, regional planning interests concerned about sprawl, and local communities interested in the direct impacts of traffic. Arterial roads are representative of typical policy conflicts in transportation and land use planning and therefore offer a useful example for studying policy change in practice.

### **The Case of Verona Road in Wisconsin**

We selected Verona Road in Dane County, Wisconsin, as the subject of the study because (1) it is an exemplary case of a suburban arterial highway, (2) communities around the road mobilized to participate in the redesign and reconstruction of an important interchange along the highway, and (3) these communities took a comprehensive approach to understanding the link between transportation and community health.

Verona Road is designated as a U.S. highway connecting Iowa to northeastern Wisconsin. In the Madison region, it



**Figure 1.** Verona Road Study Area, Madison, WI.

passes through cities where it is adjacent to residential neighborhoods, light industrial land uses, and commercial land uses. The study area is located on the southwest side of Madison (see Figure 1) near the intersection with the Beltline Highway (US 12). At this location, Verona Road cuts through the middle of a neighborhood, Allied-Dunn's Marsh, where it carries about 50,000 to 60,000 vehicles per day, 8 to 10 percent of which are heavy trucks (U.S. Department of Transportation Federal Highway Administration and State of Wisconsin Department of Transportation 2010, ES-3, 4-13).

Suburban arterials similar to Verona Road are common across the country. Verona Road has the character of a rural highway, but it is surrounded by urban activities. It was originally a rural road around which residential, commercial, and industrial uses developed, and it continues to serve regional travelers in addition to demand for local travel (see Figure 2). It was not originally a commercial street, as some urban arterials are.

Many of the neighbors who participated in the planning process for the reconstruction of Verona Road live in the Allied-Dunn's Marsh neighborhood, which has a population of about 2,500 people. It is home to many families with children, and residents have lower incomes and educational attainment compared to other areas in Madison. In the area of the neighborhood with the highest concentration of poverty, more than 40 percent of households earn less than \$15,000 per year, 95 percent of children participate in free school lunch programs, and more than 90 percent of residents are racial and ethnic minorities (U.S. Census 2010). Importantly, approximately 20 percent of households in the poorest area of the neighborhood do not have access to a private vehicle.

Although the Allied-Dunn's Marsh Neighborhood is relatively disadvantaged compared to other neighborhoods in the Madison region, it is an organized community with capacity for collective action and high levels of participation and engagement. It has active and sophisticated neighborhood associations, and numerous successful community-led organizations (e.g., Mothers in the Neighborhood, Welcomer's Program, Allied Wellness Center), as well as effective city- and county-based programs (e.g., Joining Forces for Families, Timebank).

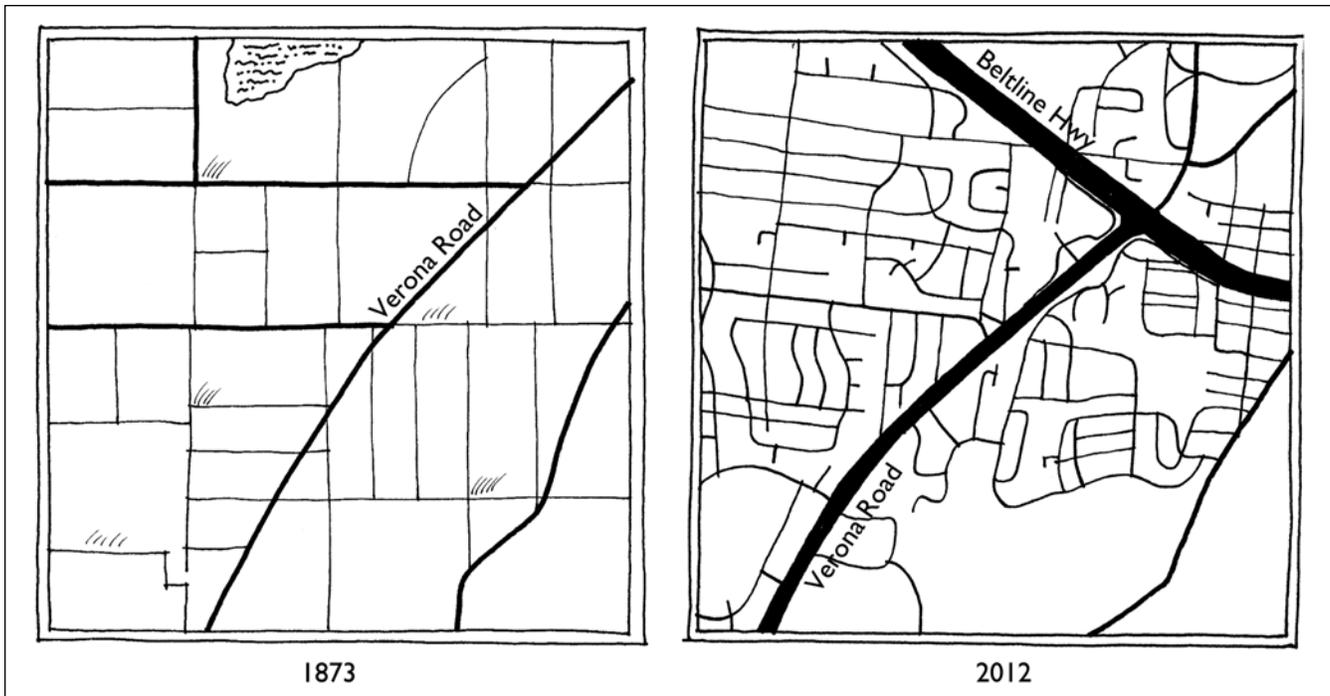
Nevertheless, the community-based programs do not have institutional authority to make decisions about Verona Road, and neighbors and community organizations do not always view planning for Verona Road as central to their missions, which typically focus on immediate issues such as reducing poverty and violence and increasing opportunities for residents. Still, neighbors agree that Verona Road affects everyone in the neighborhood, whether or not neighbors place Verona Road in the foreground or background of their organizing and activism.

### **Methods: Participatory Photo-Mapping, Focus Groups, and Interviews**

A case study is a strong approach for our research questions because it allows us to compile data from many sources and focus on the actions and discourse of actors in the policy-making process for Verona Road.

Between 2010 and 2013, we worked with and studied an organized group of Verona Road neighbors in Madison and Fitchburg, Wisconsin. The research was not connected to a formal health or environmental assessment process. Through contacts working in public health in Wisconsin, we learned that communities around Verona Road were engaged in planning its reconstruction. We partnered with these neighbors to do a participatory photo-mapping project and carried out this study of the policy process. The research received human subjects approval from the University of Wisconsin–Madison.

Our data collection and methods focused on collecting two types of information. First, we wanted to learn how neighbors understand the influence of the local transportation environment on community health, and how transportation affects their everyday lived experience of the neighborhood. Our primary method for collecting and analyzing these data was participatory photo-mapping (PPM). PPM is a method for creating and sharing information about how residents experience living in their neighborhoods. It combines qualitative and spatial information through "digital tools, narrative interviews and participatory research protocols," and seeks to represent and communicate residents' tacit knowledge of place, as well as empower neighbors to produce research, rather than being only research subjects (Dennis et al. 2009). PPM data take three main forms: (1) the



**Figure 2.** Historic Development Context around Verona Road.

photos taken by participants, (2) the descriptions they write for each photo regarding its significance, and (3) the transcripts of listening sessions (focus groups) during which participants looked at photos taken by each member of the group and discussed why they were important and meaningful. Because neighbors scope the PPM, generate, interpret, and evaluate the data, and make recommendations based on it, PPM maintains a resident-centered perspective throughout the process. PPM is related to other qualitative methods for understanding the lived experience of a place, including go-along interviews (Carpiano 2009) and photovoice (Catalani and Minkler 2010).

Our planning for the PPM included multiple stages. First, researchers, neighbors, and partners from Public Health Madison Dane County met regularly to make decisions about which participants to recruit, how to recruit them, what questions would guide the process, and how to create a forum in which everyone could discuss the photos. We made four important decisions related to our methodology. First, we would recruit both youth and adults to include multiple perspectives on mobility, accessibility, and play in the neighborhood and around Verona Road. Second, we decided to allow recruitment to be done through our neighborhood partners by means of convenience sampling as long as participants were residents of the neighborhood. Third, we decided that youth data collection should be carried out through a planned event so that youth would have adult chaperones. Adults' data collection could be done such that it was convenient for their own schedules. Finally, we decided that our

research team would compile the photos into a slideshow, and project these during the listening sessions at the community center.

After planning was completed, we worked with the Boys and Girls Club of Dane County (BGCDC) to recruit nine youth (seven girls, two boys, all around age eleven). Because the BGCDC works with students from across the neighborhood, our participants reflected the ethnic and socioeconomic diversity of the neighborhood. We worked with a neighborhood activist to recruit five adults to take photos, and twelve adults in total discussed the photos during the listening session. Thus, not all adults at the listening session took photos. We made this decision because we wanted to increase participation.

A week after taking the photos with the children, we met to discuss them as a group. During the discussion, we projected the photos so that everyone could see them. To prioritize which photos to discuss, each group chose which photos they wanted to present. To facilitate discussion, we asked two questions about each photo: (1) What is this a photo of? and (2) Why did you take this photo? The process was similar for adults. The discussion from these listening sessions was recorded and transcribed.

Once the data were collected, the researchers compiled the photos and text, both from the descriptions and the listening sessions, and these data were coded for relevant content drawing on an interpretive, grounded theory approach. The process included coding for emerging themes, both dominant and subordinate. Researchers coded the data independently

and joined the codes to establish patterns, connections, and variations among them. Each member of the organizing group commented on the synthesis of data, and all have participated in presenting these data in a summary report, in a video, and in a project briefing sheet. Youth and adult participants shared similar ideas about their neighborhood, and their photos and narratives are grouped together in the discussion below.

Our second approach to data collection was to conduct interviews with neighbors, members of neighborhood associations that have addressed Verona Road issues, elected officials, Department of Transportation planners and consultants, and others who are knowledgeable about Verona Road. We conducted fifteen semistructured interviews with knowledgeable participants and through these interviews we learned their perspectives on the proposed redesign of Verona Road; planning and decision-making processes for the Verona Road reconstruction; the structure of official and unofficial public involvement processes and their outcomes; and how residents of the surrounding neighborhoods developed their opposition of or support for the reconstruction project.

In addition, we attended public meetings, analyzed the content of documents and data about the decisions the neighbors sought to influence (e.g., environmental assessments, prior plans), analyzed public comments on plans, and followed discussions in neighborhood association newsletters and websites. Taken together, these data describe the activities of a policy community and allow us to analyze both the content and process of transportation policy change related to public health concerns.

### **The Local Experience of Transportation Impacts: Verona Road Affects Well-Being through Accessibility Barriers, Blight, and Exposure**

Through participatory photo-mapping, the community demonstrated a holistic understanding of how Verona Road and the neighborhood's transportation environment affects community health. In this case, we use "community health" broadly to include issues such as social cohesion, safety, and security. The neighbors' collective experience of the neighborhood environment is the starting point for their engagement in policy making, and although many of the local impacts of transportation have been identified in the transportation literature already, these issues are important because they are the specific issues that neighbors brought to the decision-making process for Verona Road.

The first finding from the photo-mapping is that although Verona Road marks the edge of the Allied-Dunn's Marsh neighborhood, neighbors consider Verona Road to be within the neighborhood, not outside of it as a boundary (see

Figures 3 and 4a). The first indicator of this was one neighbor's comment that Verona Road "runs through the center of our neighborhood." The second indicator was that the photo-mapping showed clusters of photos around Verona Road, including photos of gas stations, convenience stores, an independent hardware store, a chain hardware store, a Goodwill store, Walgreens, and an independent Latino grocery store.

This is significant because a substantial minority of residents in the poorest section of the neighborhood—about 20 percent—do not have access to a private vehicle. This means that neighbors who are already dealing with hardship are most likely to depend on services within walking distance for taking care of basic individual and household needs. This is one reason why the local Walgreens and McDonald's are important to neighbors who live on the east side of Verona Road—they don't need to cross Verona Road to get there.

### **Accessibility Barriers**

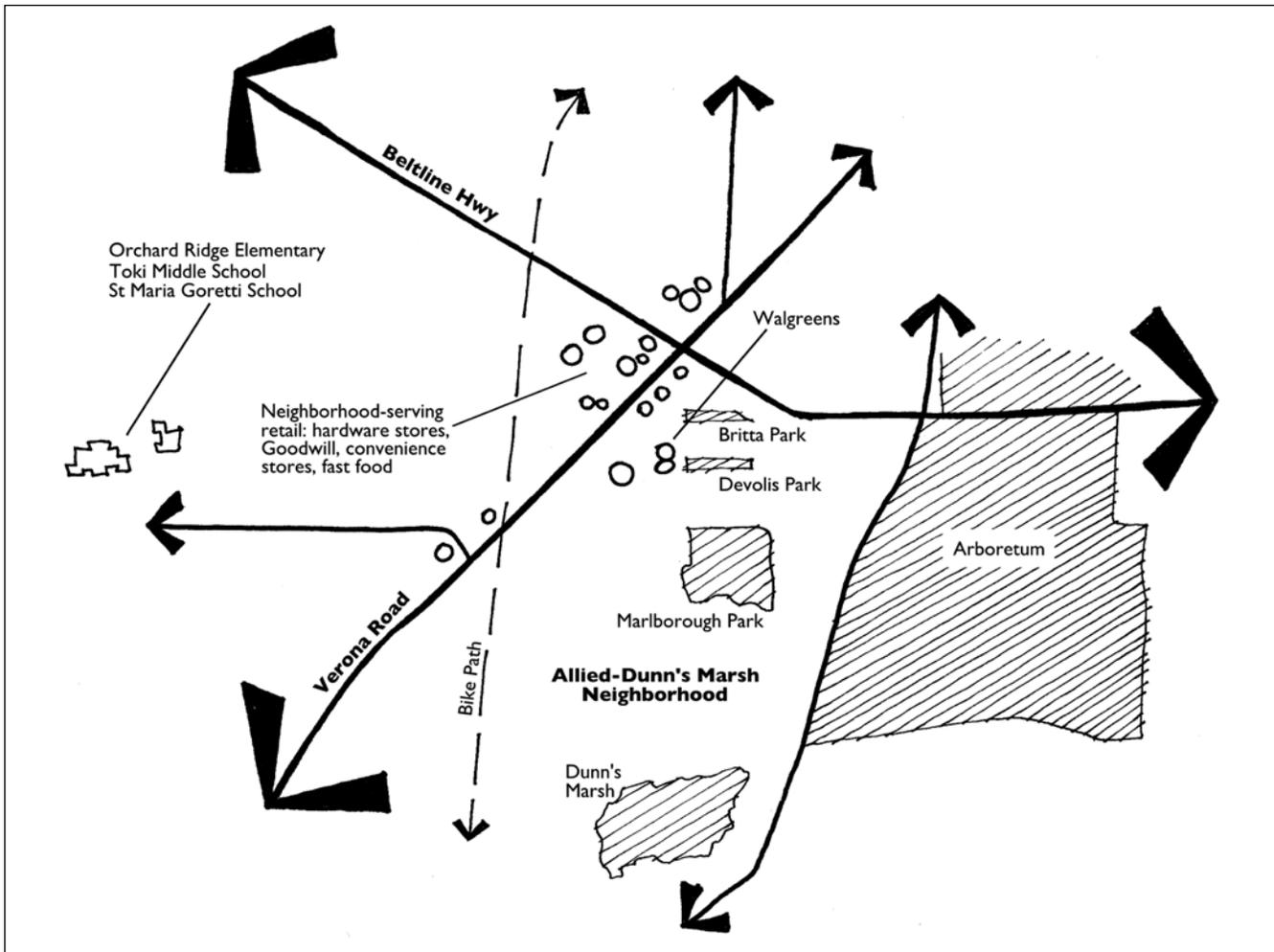
The second finding is that the design of Verona Road makes it an accessibility barrier. Although neighborhood-serving uses are easily within one quarter-mile or a five-minute walk, traveling around Verona Road is difficult for neighbors, and most avoid it if they can. Three major factors account for this difficulty: the volume, speed, and behavior of the traffic, the long crossing distances (about 30 m at the major intersections), and the lack of traffic calming and pedestrian refuges (see Figure 4b).

For one neighbor who uses a mobility scooter (Figure 4c), the availability of the bike path is key to her ability to get around:

The way I had to go, I had to go all the way down Allied, go down and get on that bike path, I had to go all the way around, and then there's another little road I got to get on before I could even get to the Home Depot or even to the restaurant. [Other neighbor asks: So, do you go that way because it's too dangerous to cross Verona Road?] Answer: Yes, I almost got hit twice.

This alternative journey takes an extra 20 to 30 minutes. She is willing to make the journey, but it is not ideal (see Figure 4c): "If you do not have transportation, that's just what you do, that doesn't mean you like it and enjoy it. It is just a way of survival."

For pedestrians and bicyclists who do travel on Verona Road, the environment is consistently uninviting and sometimes downright threatening (see Figure 4d). Yet, the amount of travel by pedestrians on Verona Road is significant enough that pedestrian paths mark the grass along the road. This type of informal path is common around arterial roads because their design intentionally delegitimizes and prohibits use by pedestrians and bicyclists for safety reasons. The collocation of arterials with low-income communities with fewer travel



**Figure 3.** Verona Road is the center of the neighborhood commercial area.

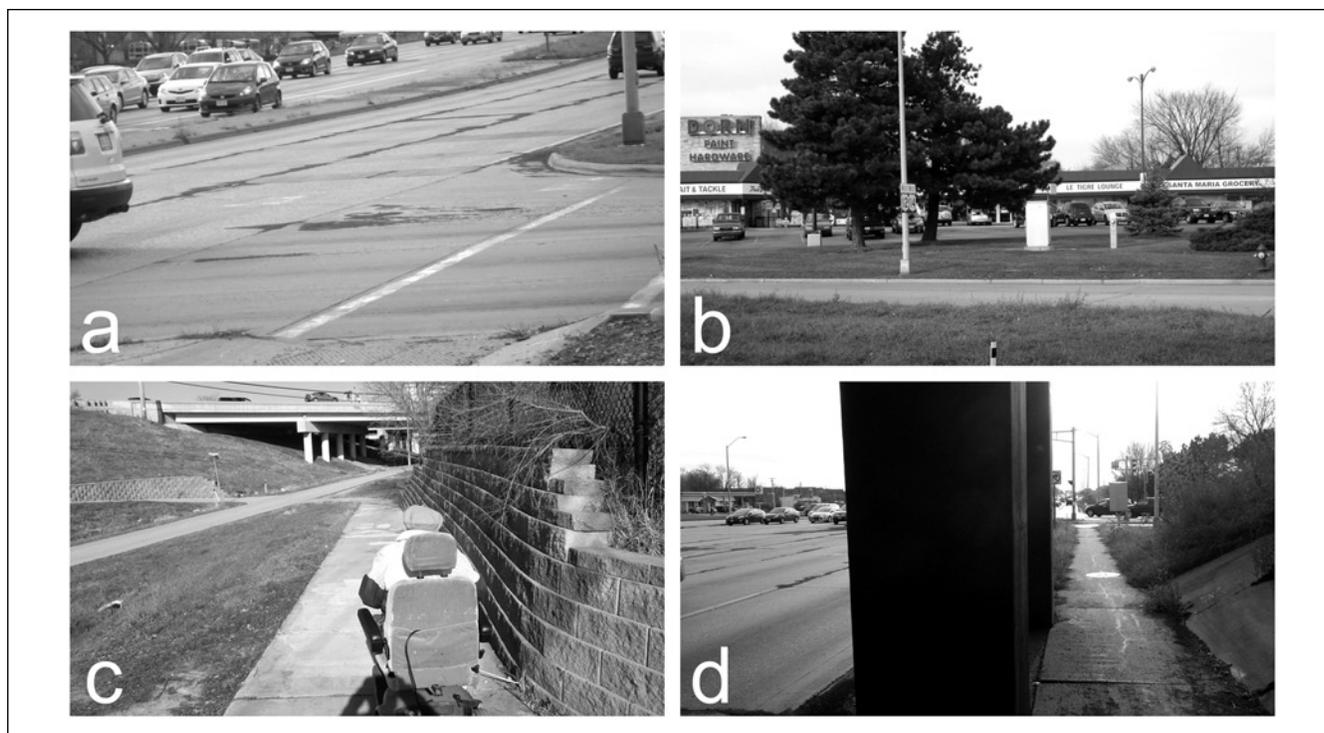
options reveals the poor logic of combining high-traffic roads with neighborhood-serving land uses.

In the arena of transportation and public health, two of the major policy concerns are obesity and physical activity, and the most common policy recommendation is to invest in pedestrian and bicycle infrastructure networks. This case study of Verona Road shows some of the potential benefits and drawbacks of this focus, and complicates what are often thought of as “go to” interventions. First, the issue of physical activity was not a primary concern of these particular residents, and the bike path that was designed for recreational travel lacked important connections to the neighborhood, including sufficient informal surveillance and enforcement of social norms. However, the existing bike paths and sidewalks in the neighborhood are important to neighbors for both accessibility and safety reasons. The bike path lets neighbors avoid using Verona Road by providing an alternative way to access businesses there, and to live a full life without using a car (as much as possible). Thus, when we plan for active transportation and evaluate whether

interventions have been effective, we should consider how infrastructure for active transportation provides connectivity within the neighborhood, and how it affects access to local services. Instead of framing these investments as means for supporting exercise in disadvantaged neighborhoods, they could be more effective if they were framed as investments in quotidian utilitarian travel, and if they were designed and located with access in mind. This would be consistent with the broader view in public health that access to opportunities is a social determinant of health.

### ***Blight and Disorder***

In addition to accessibility barriers, neighbors’ photos showed that blight from Verona Road is present in their neighborhood space and compromises their well-being. Some of the blight includes litter and graffiti. Another form of blight reflects what we call *official neglect*. Photos of official neglect included a rusty fence lining another busy highway in the neighborhood, a sidewalk stained by asphalt



**Figure 4.** Accessibility and mobility barriers: (a) Long crossing distance, no traffic calming; (b) retail located across the arterial; (c) neighbor avoids arterial, long way around; (d) sidewalk exists, but pedestrian realm is scary.

runoff from a recent parking lot resurfacing, a fallen stop sign that had not been replaced, and boarded-up buildings that the Department of Transportation had acquired to expand Verona Road. Indicators of social disorder (i.e., “broken windows”) in the social-epidemiology literature are associated with poor health outcomes. In this case, the indicators of social disorder are directly related to the maintenance of the transportation environment and are not necessarily caused by residents’ behaviors.

### *Exposure to Hazards*

The fourth major aspect of the relationship between the transportation environment and community health reflected in neighbors’ photos was direct exposure to hazards. Neighbors identified a range of threats to their personal security, things in their environment that indicate danger, and other negative externalities related to the transportation environment. These exposures to hazards come from two main sources. The first is traffic—fast, heavy traffic on Verona Road with street designs and operations that make it dangerous for motorists, pedestrians, and bicyclists. Second, neighbors consider many of the places around Verona Road to be unsafe because few people use them, there aren’t enough “eyes on the street” there, and they have a history and reputation of violent crime. Thus, threats are both physical (e.g., traffic) and social (e.g., perceptions and presence of illicit activity).

For example, as discussed above, the bike path is important for mobility and access when neighbors want to avoid using Verona Road, but it has shortcomings. The main one is that it is deserted. The lack of activity on the bike path—because the surrounding land uses do not generate much activity—creates a place where people feel vulnerable to social threats. This suggests that in low-income communities framing pedestrian and bicycle infrastructure as investments in physical activity misses the mark. Instead, they should be framed as essential elements in neighborhood accessibility, and they need to be considered in the context of surrounding land uses.

The sense of aggressive, heavy, fast traffic bearing down on a traveler who uses the space by car, bike, or foot was also a major theme. Photos of this included cars making left-hand turns and passing too close to the small pedestrian refuge while pedestrians wait in the middle of traffic on the narrow median because the traffic signal timing did not provide sufficient time to cross. A photo of a roadside memorial for a traveler who died in a crash shows that neighbors are very concerned about safety.

Photos of truck traffic represented the noise, air pollution, and safety hazards to which neighbors feel vulnerable. One participant took photos of a home-improvement project aimed at dealing with traffic noise: the family built a waterfall in the backyard. Although the drop was more than 1.5 feet, it did not create enough sound to counter the traffic. In fact, they couldn’t hear the waterfall at all over the sound of

the traffic. Another resident talked about how the traffic noise disturbs her family's sleep, and how this is particularly difficult when family members have existing health problems and depend on rest to recover. When we went out to collect samples of the ambient noise on a day with moderate traffic and no wind, the sound ranged from about 60 to 75 dB. Environmental noise from traffic and other neighborhood sources is associated with diminished well-being, but not necessarily mental or physical illness in a classical definition (Stansfeld and Matheson 2003).

Similar public health implications of neighborhood traffic environments have been documented in Health Impact Assessments (e.g., Buford Highway in Atlanta). What is significant in this case is what happened to knowledge of these well-known local impacts in the policy and planning process for the reconstruction of the road.

### **Advocates for Local Public Health Impacts Must Work within a Regional Planning Forum**

Through community organizing, neighbors developed their own agenda for Verona Road that included interventions to address the issues described above. Such interventions included secure pedestrian and bicycle crossings (both at-grade and a bridge), realigning a proposed frontage road to increase safety around the Walgreens, realigning a ramp to save a park, landscape treatments for storm water, public art, sound walls, a plaza with land uses that would attract people, and air quality monitoring. In addition to interventions for Verona Road, neighbors also suggested improving local streets and transit stops by completing sidewalk connectivity, including landscape elements, and painting a design on the pavement at an important local intersection. Overall, their proposals reflected local concerns and represented the pride they have in their neighborhood and their aspirations for environmental sustainability and environmental justice.

The organized neighbors participated in the Verona Road planning process for more than ten years through public meetings, private meetings with planners, meetings with elected officials, providing comments on official documents, and networking with local stakeholders including neighbors in nearby communities and subject-matter experts. Much of this participation was structured by the Department of Transportation's formal public involvement process for the environmental impact study of the Verona Road project. But to be effective, neighbors worked outside of the official public involvement process because it was inadequate for addressing their environmental justice-related concerns.

Through their activism (both within and outside of the official environmental review processes), neighbors achieved important design changes that benefited their neighborhood. Examples of these included a re-alignment of a proposed frontage road that would have cut off the neighborhood from the Walgreens, a realignment of a ramp that would

have removed a neighborhood park, a pedestrian underpass (a second-best option), and public art.

Yet, when any of the neighbors' desired changes conflicted with the project's regional mobility objectives, or acknowledged possible inequalities, they were dismissed. For instance, the Department of Transportation did not consider installing sound walls until a newly elected mayor insisted, nor did it accept an offer from the state department of natural resources to conduct air quality monitoring in the corridor. The project planners sometimes modified the design in the community's favor, but these changes did not recenter the project's discourse from regional mobility to mitigating the local impacts of Verona Road traffic, nor did it represent policy agenda change.

Ultimately, the Verona Road project maintained its mission to solve regional mobility problems, and never became a serious opportunity to mitigate the negative local effects of traffic. Virtually all of the participants we interviewed (including Verona Road neighbors) used language that situated the neighbors' struggle with the local impacts of traffic in tension with regional transportation goals. For instance, an elected official explained that everyone in his district is affected by the Verona Road project because of cut-through traffic problems: "this project really affects all of my neighborhoods. We have a number of people [who] avoid the Beltline . . . and come up [our neighborhood main street]."

Nearly all participants discussed the link between regional growth and traffic. As one participant in the process explained: "The decisions made on something like a Verona Road interchange . . . are primarily not only for handling current traffic, but planning for future expected traffic and expected growth." Neighbors were among those who reasoned that decision making around the project reflected regional growth and its politics:

You have not experienced political pressure like those two governmental entities [Dane County and the City of Madison] can apply to try to force outlying communities to slow their rate of growth . . . that through public policy initiatives we need to first make sure that the environment for development and redevelopment is favorable to Madison.

In a more functional sense, the discourse about the project also appealed to ideas from engineering and network design. For instance, a neighborhood activist argued that the Verona Road reconstruction project was not going to solve local congestion (the project's justification) because the bottlenecks are a network problem, not a link problem:

[The conversation] became, "How can we take this portion of [Verona Road] and make it . . . handle traffic better," knowing full-well that . . . no matter what you did increase traffic [capacity on Verona Road] it was going to be limited by what they could do with the Beltline [highway, because]. . . . traffic growth on the Beltline highway . . . doubles every 10 years.

An elected official reflected on the tradeoffs between the regional framing and the local impacts, and posited that conflicts between local and regional priorities cannot be resolved through the existing intergovernmental system. Instead, it would “require an Act of Congress” because “they are getting the side effects of our way of dealing with transportation policy in our country.” In these conversations, the power to mitigate the negative effects of traffic became increasingly distal from the site of planning and project implementation. The side effect of weak regional institutions is that addressing local environmental and health justice problems requires either state or federal policy, or regional collaboration. In this case, there was insufficient political support for the neighbors’ cause to generate a regional, collaborative process.

When participants discussed the regional paradigm, it was taken for granted and given the status of a “reality” that could not be changed. For instance, one participant said, “It’s the reality that we are building a solution here that presumes more sprawl . . . and not by intent, but certainly by result, encourages more sprawl.” A project planner made a sarcastic appeal to reality when he lamented that neighborhood activists wanted to “wave the wand” to make the transportation engineers solve the local problems and create the street of their dreams. This belittling comment illustrates how Verona Road’s problem definition is stubbornly maintained through the “street-level” actors’ own understanding of what is at stake.

In this case, the local impacts that neighbors identified had a double meaning as regional problems, and solving them would have been “unrealistic” given the regional mobility goals of the project. Indeed, it is likely that any interventions seeking to redistribute traffic (or its negative impacts) would need to be regional in scale. This is because “siting” traffic is not only a function of the alignment and design of roads but also a function of the distribution of land uses. Literature about the effects of urban form on travel suggests that policies aiming to reduce or redistribute traffic are more effective when pursued at a regional scale (Boarnet 2011). However, a number of Verona Road’s problems such as insufficient maintenance and local accessibility could have been addressed through project-level policy, design, and operations strategies, and by creating a stronger connection between city transportation policy and planning and the state-led planning. Arterials have been the object of innovative strategies in corridor planning, traffic management, transit service, and urban design, and tools and techniques are available for cases where there is political support to use them.

## Discussion and Policy Implications

The motivation for this study came from our observation that socially important policy issues such as the public health effects of transportation systems, access to quality transit,

local exposure to air and noise pollution from transportation, and the safety of vulnerable populations are not always found at the core of mainstream transportation policy making. Yet these same issues commonly form the basis of community efforts to improve their neighborhoods, and they are often associated with coalition building around environmental justice issues. If, in theory, policy reflects public values, how do we move from changes in values to changes in policy? Could this grassroots interest in health and transportation policy provide the social change to motivate policy change?

To address these questions, we examined the case of Verona Road, an arterial highway that passes through an environmental justice neighborhood in Dane County, Wisconsin. Research methods included participatory photo-mapping with residents, focus groups with residents, and interviews with participants in the planning process to create a new design for an important interchange along Verona Road. Using mixed methods helped to make the analysis more robust, particularly given the sample of the participatory photo-mapping exercise, which was small and selected by convenience despite efforts to recruit a diverse set of participants that reflected the neighborhood’s population. Although one case of an arterial road reconstruction does not represent the political, institutional, and technical challenges of arterial roads planning in general, or of environmental justice, transportation, and public health policy change, it provides useful insights into how these processes work. The issues around Verona Road are not uncommon, and arterials border environmental justice communities throughout the United States.

The research findings of the participatory photo-mapping of Verona Road show three primary ways in which the arterial road has a negative effect on nearby residents: it limits pedestrian access to locally important resources, neighbors perceive that it is the location and source of illicit activities, blight, and trash, and it is the source of environmental health hazards such as crashes, air pollution, and noise from high traffic volumes. This information points to specific ways in which planners can work with arterial roads as a strategy to reduce neighborhood-level health disparities. Further research about this typology of impacts would be needed to learn the conditions under which these are indeed the primary concerns of neighbors, and what additional concerns should be included in planning to mitigate the negative effects of arterials on neighboring communities.

Incremental changes are important, and in the case of Verona Road they were critical “wins” for the community, and add to our understanding of linking public health and transportation. Although these incremental changes are important, they alone cannot address the problems of arterial roads that raise conflicts between regional needs and local impacts. Issues that pose this regional-local conflict require a more complex solution. Integrating arterial roads planning into regular planning practice involves not only developing a set of design alternatives and operations strategies but

engaging in a discussion about regional development and equity: who is served by the regional facility and what communities experience its negative effects. In this case, there was no forum in which this conversation could happen, nor were planning techniques or analyses used that would relate local and regional transportation impacts or needs.

When neighbors participated in the planning process to have a discussion about the priorities for Verona Road and equity, their main concerns were excluded, even if some of their ideas were adopted. Through analysis of the grassroots groups and their interactions with planners and policy makers, we found that serious attempts to mitigate “local” public health impacts were excluded from policy discourse by defining the relevant problem as regional traffic, not local impacts.

Most participants learned that the priorities for Verona Road had already been decided in prior plans, such as Wisconsin’s state transportation plan that designated Verona Road a regionally important corridor. Because environmental justice neighborhoods are not usually participants in statewide transportation planning processes (neighbors rallied around transportation problems when they were at their doorstep), their concerns were not represented in these plans. This is a problem for advocates and transportation planners alike. Existing transportation planning processes that are structured around federal and state requirements (i.e., environmental impact assessment) are not successful forums for addressing the impacts of arterial roads on environmental justice communities.

The lack of forums and institutions may be a wider problem for health in all policies and could explain the popularity and utility of health impact assessment (HIAs). Analytically, HIA “views health holistically, considering not only biophysical health effects, but also broader social, economic, and environmental influences” as well as health equity (Bhatia and Wernham 2008, 993). The “assessment” in HIA provides the knowledge and evidence to inform policy decisions, but HIA may be more powerful as a form of political action than as an analytical tool. HIA has been used to create forums for contesting decisions and reframing policy debates to include community health concerns (Bhatia and Corburn 2011, 2411). Thus, the key to the HIA is how it operates politically to transform existing agendas. In this case, an HIA could have drawn attention to the residents’ public health concerns if one had been conducted early enough in the process to influence policy decisions about statewide traffic corridors, but it is not clear whether an HIA would have changed the course of policy decision making. The public health field offers other tools such county-level public health plans and community health assessments that may also be used to generate knowledge, stakeholder participation, and political will to address public health issues through multiple policy sectors. Indeed, one of the reasons for our engagement in this work was a community health assessment that public health nurses working in surrounding neighborhoods conducted in response to neighborhood conflict about violence.

In this case, existing design, traffic operations, and planning strategies could be used to improve the conditions for local residents while meeting the regional mobility needs, but this cannot happen until Verona Road has been reframed as locally important. Thus, addressing the challenges of the case of Verona Road depends on successfully redefining the objectives of arterials that pass through disadvantaged neighborhoods.

Without state or federal policy about health impacts of transportation and their distribution, policy elite in transportation have worked from within agencies to include health in regional planning processes and tools, gain support and develop capacity among planning staff, and develop evidence and analytical tools such as cost–benefit analysis. This work is collaborative, voluntary, and incremental, and positions public health concerns such that they do not “adversely [affect the] pursuit of core transportation goals” (John A. Volpe National Transportation Systems Center 2012). For instance, if regional transportation models were used to estimate the differential effects of arterials management policies on community health, these tools could be used in advocacy. If policy, resources, and interventions were to support the tools, then planners could be more effective in incorporating health concerns into the design of transportation systems.

With respect to interscalar strategies that would create a flexible framing for “local” issues, this is not a new approach. For example, Kurtz (2003) argues that environmental justice is a politics of scale, and she describes how an organization moved “beyond a NIMBY stance [to] frame their grievance as part of a broader pattern of untenable . . . practices.” For the case of the public health effects arterial roads, this could mean raising arguments about network planning, resiliency, or regional competitiveness, for example, to illustrate the widespread effects of traffic and transportation infrastructure on regional sustainability. More generally, planning practices designed to deal with institutional conflicts (e.g., creating new forums, expanding the set of relevant stakeholders, creating new discovery and analytical processes) are needed for making the changes that these advocates wish to achieve.

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