Congestion Pricing and Environmental Justice: *Research Conducted for an Environmental Justice Analysis of Tolling on the SR 520 Bridge in Seattle*

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ABSTRACT

In addition to providing funding for our aging transportation infrastructure, congestion pricing can improve traffic flow, safety, and trip reliability. Given these benefits, more states are exploring congestion pricing.

There is concern, however, about the potential unintended consequences of congestion pricing on low-income people, who may not be able to afford the tolls. Will un-tolled alternatives, such as riding transit or taking an alternate route add too much travel time and distance to be viable options? Will low-income people have a credit or debit account to establish or replenish an account for an electronic transponder? Will limited-English proficient people understand how to obtain a transponder or use the system? There is very little data to answer these questions.

Environmental Justice guides states to evaluate the potential adverse effects of highway projects on low-income and minority people. The stakes are high: transportation officials need to be able to more definitively answer questions about the equity of congestion pricing from policymakers and the public, or risk lawsuits and costly delays to their projects. Reliable data can also provide sound foundation for meaningful mitigation, should it be necessary.

Because environmental justice is an emerging science, however, states are wrestling with how to evaluate the effects of congestion pricing on low-income and minority populations. Typically, to conduct an environmental justice analysis on a highway project, we examine the environment within a specified distance from the project limits, because the project effects – such as increased noise or traffic – should not extend farther than this. Because tolling a roadway or bridge will affect users of the facility as much as it will affect the environment around it, we must supplement the conventional approach when we conduct an environmental justice analysis of a tolled facility.

At the request of the Washington State Department of Transportation, PRR, a multi-disciplinary public affairs firm, developed a methodology for conducting an environmental justice analysis of tolled facilities. We used this approach in our evaluation of the effects of tolling the SR 520 Bridge on low-income and minority people.

This paper will present:

- Our research methodology, which includes a transit intercept survey, telephone survey, and focus groups with SR 520 Bridge users;
- Applying our findings to an environmental justice analysis; and
- Recommendations for next steps in evaluating the effects of congestion pricing on environmental justice populations.

INTRODUCTION

In addition to providing a funding source for our aging transportation infrastructure, congestion pricing can reduce traffic and improve safety and trip reliability. Given the obvious benefits of congestion pricing, more and more states are exploring it as a funding option for their bridges and highways.

There are some potential unintended consequences of congestion pricing, however. Low-income people may not be able to afford the tolls. In many communities, un-tolled options, such as riding transit or taking an alternate route may add too much travel time and distance to be a viable alternative. Low-income people without a debit or credit card may not be able to open an account for an electronic transponder, or they may not have enough cash to establish an account. For limited-English proficient people, it may be very difficult to understand how to obtain a transponder or use the system.

Environmental justice acknowledges that the quality of our environment affects our lives and negative environmental effects should not disproportionately burden low-income or minority communities. As part of its commitment to environmental justice, the federal government guides states to evaluate the potential adverse effects of federally-funded projects on low-income and minority people.

Environmental Justice and Transportation
Negative environmental justice effects associated with transportation may include, among others: limited access to a publicly-funded facility, disruptions in community cohesion, presence of hazardous materials, raised noise levels, or increased water and/or air pollution.

The stakes are high: transportation officials need to be able to answer legitimate questions about the equity of congestion pricing from policymakers and the public, or risk lawsuits and costly delays to their projects.

Because environmental justice is an emerging science, however, states have been wrestling with how to evaluate the effects of congestion pricing on low-income and limited-English proficient populations. To conduct an environmental justice analysis on most highway projects, we examine the effects of the project on the human environment within a specified distance from the project limits, because the effects of constructing and operating the project – such as increased noise or traffic – typically do not extend farther than this. However, the tolling of a roadway or bridge will affect *users* of the facility as much, if not more as it will affect people living and working near it. To analyze the effects of congestion pricing on environmental justice populations, therefore, we need to supplement the conventional approach.

A search for a good approach to evaluating the effects of tolling on low-income users revealed that few states had conducted thorough research on the issue. Most research focused on people with household incomes under $40,000, but no research had been conducted with people with household incomes at or below the federal poverty level. (In 2008, the federal poverty level was $21,200 for a family of four in the 48 contiguous

states.) We hypothesize that this may be because it is much more difficult to survey low-income and limited-English proficient populations than the general population.

On behalf of the Washington State Department of Transportation (WSDOT), PRR, a multi-disciplinary public affairs and communications firm developed a methodology for conducting an environmental justice analysis of tolled facilities. PRR implemented this approach in our evaluation of the effects of tolling the existing SR 520 bridge on low-income and minority people.

About This Paper

This paper is organized into four sections. The first section provides background information on plans for tolling the existing SR 520 bridge and information on federal and state policies and guidance for environmental justice. The second section explains PRR's methodology for collecting data on the effects of tolling on low-income and limited-English proficient people. The third section discusses our findings from the surveys, focus groups, and Spanish-language interviews. The final section discussions our conclusions about next steps in evaluating the effects of tolling on environmental justice populations.

A few caveats:

1. This is not an environmental justice analysis. Instead, it is an overview of our methodology and findings for collecting supplementary data on the effects of tolling on low-income and minority people. For a copy of the Urban Partnership SR 520 Variable Tolling Project Environmental Justice Analysis, please contact the Washington State Department of Transportation.

2. These findings are relevant only to SR 520 bridge users and are not necessarily applicable to other tolled projects. Other communities may find that their research results differ, depending on the availability of transit and un-tolled alternate routes, as well as local demographics and land use patterns. However, the methodology that we used can be adapted to other communities.

3. Environmental justice populations include low-income and minority people (see sidebars). However, in this paper, when we discuss the adverse effects of tolling on environmental justice populations, we refer to low-income populations and only a subset of minority populations: limited-English proficient populations. This is because the adverse effects of tolling disproportionately fall on low-income populations (who may not be able to afford the tolls) and limited-English proficient populations (who may not be able to understand the system or how to acquire and use an electronic transponder).

How do we define low-income?
A low-income person is an individual whose household income falls below the federal poverty guidelines, as defined by the U.S. Department of Health and Human Services.

For 2008, the federal poverty guideline for a household of four in one of the 48 contiguous states and Washington D.C. was $21,200.

How do we define minority?
An individual who identifies himself as Black (a person having origins in any of the black racial groups of Africa); Hispanic (a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race); Asian American (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); American Indian/Alaskan Native (a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition); or some other race.

BACKGROUND

Early Tolling on the SR 520 Bridge

The Lake Washington Urban Partnership Agreement (UPA) is a cooperative effort to use innovative traffic management tools for improving safety and traffic flow along SR 520 and I-90 between Seattle and the Eastside. The SR 520 bridge provides a critical west-east connection between Seattle and the region's high-tech industry center.

The agreement calls for a new variable tolling system that will improve traffic flow on the SR 520 corridor and provide up to $500 million to replace the aging SR 520 bridge across Lake Washington and make other improvements to the corridor.

Policies and Guidance Related to Environmental Justice

In response to a concern that minority and low-income people bear a disproportionate amount of adverse health and environmental effects of public projects, President Clinton issued Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* in 1994. It directs each federal agency to make environmental justice part of its mission.

Following Executive Order 12898, USDOT issued an *Order to Address Environmental Justice in Minority Populations and Low-Income Populations*.[i] It provided guidelines for how environmental justice analyses should be performed and how environmental justice should be incorporated into the transportation decision-making process. The USDOT Order requires federal agencies to do the following:

1. Explicitly consider human health and environmental effects related to transportation projects that may have a disproportionately high and adverse effect on minority or low-income people; and

2. Implement procedures to provide "meaningful opportunities for public involvement" by members of those populations during project planning and development.[ii]

FHWA issued a similarly-worded order, *FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*.[iii]

Title VI of the Civil Rights Act of 1964 compels us to look at the effects of projects on people with limited-English proficiency. Title VI requires that "no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

Other federal laws, such as the National Environmental Policy Act (NEPA), Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended,

the Civil Rights Restoration Act of 1987, and the Transportation Equity Act (TEA-21) also include the nondiscrimination requirements outlined in Title VI.

In addition to regulatory requirements, states and tolling authorities need to be able to answer legitimate questions about the equity of congestion pricing from legislators and the public, or risk lawsuits and costly delays to their projects.

METHODOLOGY FOR COLLECTING DATA ON THE EFFECTS OF TOLLING

Identifying the Study Area

To conduct an environmental justice analysis on most highway projects, we examine the effects of the project on the human environment within a specified distance from the project limits. The effects of constructing and operating the project – such as increased noise or traffic – typically do not extend farther than this. However, tolling of the existing SR 520 bridge will affect *users* of the facility as much, if not more, than it will affect people living and working near the facility. For that reason, we examined the communities from which trips on the SR 520 bridge originated (the SR 520 travel shed).

To determine the SR 520 travel shed, the Washington State Department of Transportation (WSDOT) placed video cameras on SR 520 in May 2008. Cameras were placed at on- and off-ramps during the morning and evening peak periods, as well as midday and weekends. The Washington Department of Licensing provided WSDOT with the addresses associated with the registered owners of each vehicle that was videotaped. (No other identifying information – such as the vehicle owner's name – was released to WSDOT.) Using those addresses, we developed a map of the SR 520 travel shed. Exhibit 1 shows the SR 520 travel shed. The dots represent registered addresses of vehicles that crossed the SR 520 bridge on at least one of the days that WSDOT videotaped license plates.

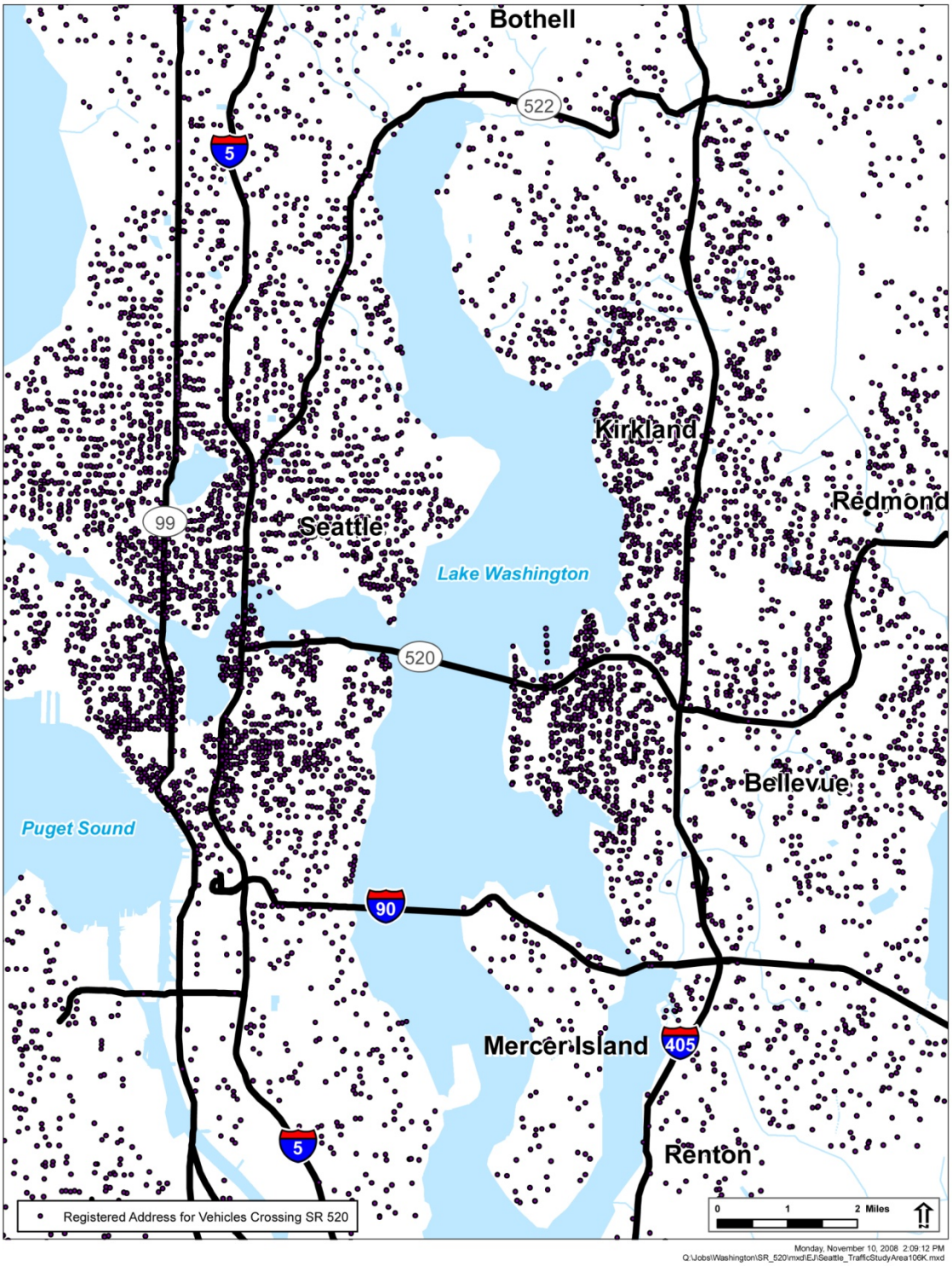

Exhibit 1 – Map of SR 520 Travel Shed

Collecting Data on Effects of Tolling on Low-Income and Limited-English Proficient Populations

For a typical environmental justice analysis, we consult information gathered from public involvement activities and data from other disciplines, such as traffic and transportation, air quality, and cultural resources. Because very little data has been collected on the effects of tolling on very low-income people, we supplemented that information by conducting surveys, focus groups, and Spanish-language telephone interviews with SR 520 bridge users.

Surveys of SR 520 bridge users: To understand how tolling of the existing SR 520 bridge might affect low-income and minority people, we conducted a telephone survey of 600 individuals who use the SR 520 bridge two or more days a week. Three hundred respondents qualified as a member of a population protected under environmental justice laws and regulations. In other words, 300 respondents either identified themselves as Black, Hispanic, Asian American or Pacific Islander, American Indian or Alaskan Native, and/or indicated that their household income was at or below the federal poverty level.

To capture SR 520 users who are limited-English proficient, we translated surveys into Spanish. We were also prepared to translate the surveys into other languages, but there were no substantial concentrations of survey respondents who speak other languages.

In addition to demographic questions, we asked survey respondents how their travel behavior will be affected by a toll on the SR 520 bridge. We asked if they will:

- Pay the toll and continue to use the bridge;
- Choose an alternate route;
- Change their time of travel to a time when the toll will be lower;
- Use transit or rideshare; or
- Forgo the trip altogether?

We described how the technology will work for collecting the toll and asked respondents to indicate if they are likely to have difficulty obtaining a transponder. For a copy of the final survey report – including telephone and transit-intercept survey questions – please contact WSDOT.

To find our survey sample, WSDOT videotaped the license plates of SR 520 bridge users and the Department of Licensing provided us with the addresses of the vehicle owners associated with those license plates. (As mentioned earlier, no other identifying information was provided to WSDOT.) We used a reverse directory to find phone numbers associated with those addresses. To supplement this sample, we purchased a targeted list of low-income and minority residents living in the SR 520 travel shed. Because the license-plate videotaping missed regular transit users, we conducted a transit-intercept survey in June 2008. We conducted the survey before the University of Washington finished its regular session, to ensure that we captured students, faculty, and

staff who use the SR 520 bridge. Staff handed out surveys to transit riders at park-and-ride lots and freeway stations that serve SR 520 bridge users.

Focus groups and Spanish-language interviews with SR 520 bridge users: To collect more detailed information about how tolling might affect low-income and minority people, we conducted two focus groups. One focus group was with English-speaking low-income bridge users. The second focus group was with English-speaking individuals who are not low-income or minority and was conducted for comparison purposes.

We recruited focus group participants by contacting survey respondents who indicated they would be willing to participate. We also recruited through contacts at social service agencies that serve environmental justice populations in the study area.

Typically, attendance rates at focus groups that include low-income and limited-English proficient participants are much lower than those at focus groups that include participants from the general population. This may be attributable to the fact that low-income and limited-English proficient people are more likely to have challenges associated with transportation, child care, or work schedules. To offset this, in addition to the $75 incentive that we usually offer focus group participants, we also provided a $20 transportation stipend and a $20 child care stipend. We also held the focus groups at facilities that were located in areas with higher concentrations of low-income or limited-English proficient people and that were easily accessible by transit.

We also conducted six telephone interviews in Spanish with SR 520 bridge users. Two of the six interviewees had household incomes below the federal poverty level. The remaining four interviewees had household incomes below 130% of the federal poverty level. We offered interview participants a $75 stipend for participating.

For a summary report from the focus groups and Spanish-language telephone interviews – including the focus group moderator guide and English-translated interview script – please contact WSDOT.

Evaluating Data on Low-Income Bridge Users

Evaluating the equity of tolling is still an emerging science and there is no clear guidance as to what constitutes a fair tolling system. In our analysis, we followed guidance from the Federal Highway Administration and Washington State Department of Transportation, which apply two criteria to determine whether an effect is disproportionately high and adverse:

1. Low-income and/or minority populations will predominately bear the effects; or

2. Low-income and/or minority populations will suffer the effects and the effects will be considerably more severe or greater in magnitude than the adverse effects suffered by the general population.

Low-income or minority populations will not predominately bear the effects. The toll will be charged to all bridge users and all bridge users will be required to purchase transponders. Although we cannot determine exactly what proportion of bridge users are low-income or minority, by looking at the travel shed map overlaid with U.S. Census data (Exhibit 2), it does not appear that there are more bridge users coming from census block groups with higher proportions of low-income or minority residents.

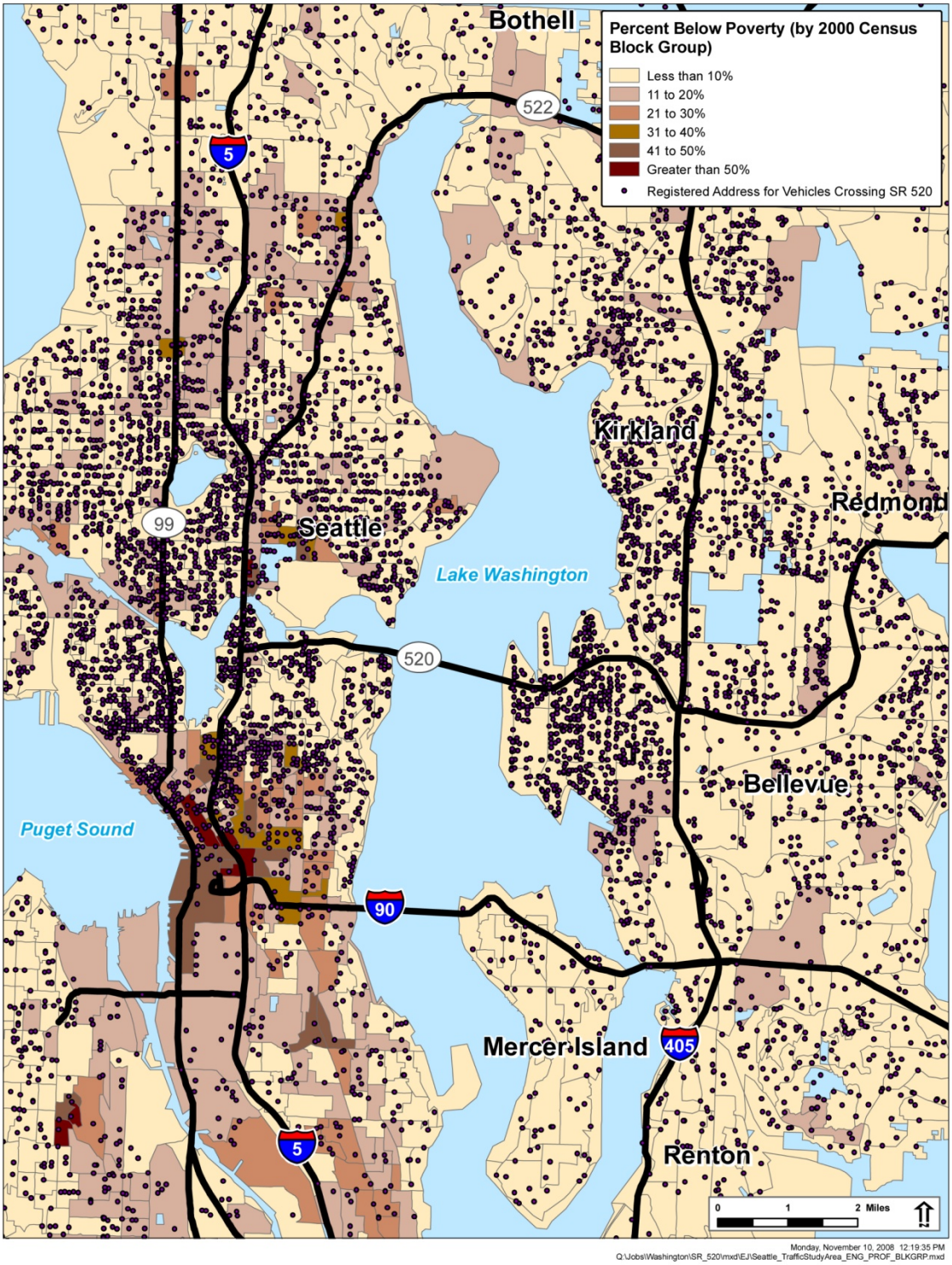

Exhibit 2 – Poverty Data from the 2000 U.S. Census Overlaid with Map of SR 520 Travel Shed[iv]

The tolls on the SR 520 bridge will be appreciably more severe for low-income users, however, because low-income users will have to spend a higher proportion of their income on the toll.

Previous analyses of the equity of tolling have concluded that the effect would not be disproportionately high and adverse on low-income populations for the following reasons:

1. The benefits of improvements to trip reliability and speeds will offset the burden of the tolls, and

2. There are viable options to avoiding the toll. Furthermore, because low-income populations tend to use transit at a higher rate than the general population, improvements in transit speeds and reliability will offset the burden of the tolls.

Regarding the first point, while it is important to note that many low-income people will benefit greatly from a faster, more reliable trip, environmental justice principles hold that to offset a disproportionate adverse effect to low-income populations, the benefit also needs to disproportionately affect low-income populations. In this case, the benefits of a faster, more reliable trip apply to all people and not just low-income populations.

Therefore, the extent to which tolling has an adverse effect on low-income or minority populations rests on whether there are viable options to avoiding the toll, such as transit or un-tolled alternate routes. We evaluated the survey, focus group, and interview data to determine whether there are viable alternatives for low-income or minority populations. The next section provides details on our findings.

FINDINGS

Some Low-Income Users Support Tolls in Exchange For a Faster, More Reliable Trip

Nearly 36% of low-income respondents to the telephone survey indicated they would pay the toll for a faster, more reliable trip.

We probed this further in focus groups and interviews with low-income and Spanish speaking bridge users. At least half of the low-income participants indicated they supported a toll on the SR 520 bridge if it means a faster, more reliable trip. This is consistent with other studies on the equity of high-occupancy toll (HOT) lanes, which also found that many low-income people supported congestion pricing if it ensured a faster, more reliable trip.

In the HOT lanes studies, researchers hypothesized that low-income people who worked for hourly wages or depended on child care would be willing to pay a toll to avoid losing wages or paying high late fees at their child care facilities. We heard similar feedback in our focus groups and Spanish-language telephone interviews. For many low-income people who are juggling multiple jobs and child care, traffic delays may pose an even bigger burden than a toll.

It is worth noting that a few of the respondents who supported the idea of tolling SR 520 as a way of managing congestion also indicated they did not believe that low-income people should pay the full toll amount.

Tolls Will Present a Burden to Many Low-Income Drivers

In our low-income focus groups and Spanish-language interviews, many respondents indicated the tolls would be a burden to their families. According to our analysis, while some low-income focus group and interview participants will forgo the trip or take an un-tolled route rather than pay the toll, others will give up other expenditures to pay the toll because they do not feel they have a better choice.

Transit Is Not a Viable Alternative for Many Low-Income Bridge Users

Although some national and regional studies suggest that low-income populations use transit at a higher rate than the general population, results from the transit intercept survey suggest that transit routes on the SR 520 bridge do not serve low-income users at a higher rate than the general population.

Many low-income respondents said that transit was not an option for them, as service is infrequent, unreliable, requires several transfers, or takes too much time. Nearly 51% of low-income telephone survey respondents indicated they would *not* use transit as an alternative to paying the toll. More than 53% of those who said they would not use transit indicated that transit service is not frequent enough on their routes. Nearly 56% said they

live or work too far from transit. Of those low-income telephone survey respondents who said they would use transit to avoid paying the toll, 63% said that it would greatly increase their travel time.

Interestingly, fewer than 3% of respondents to the transit-intercept survey had household incomes at or below the federal poverty level. Although there may be confounding reasons why low-income people were less likely than others to complete and return the survey, these results also may support our findings that transit is not an option used by many low-income SR 520 bridge users.

Low-Income Bridge Users Will Use Un-Tolled Routes, but These Routes Will Add Substantial Time and Distance to the Trip

More than 64% of low-income respondents to the telephone survey indicated that they *would* use an alternate route to avoid paying the toll. Of those low-income survey respondents who said they would *not* use an alternate route, 67% said that using an alternate route would greatly increase their travel time. Nearly 97% said an alternate route would greatly increase their travel distance.

Setting up an Account to Collect the Toll Will Present a Burden to Many Low-Income and Limited-English Proficient Bridge Users

There will be no toll booths on the SR 520 bridge. Instead, tolls will be collected using a transponder unit that drivers will install in their vehicle windows. Drivers will need to purchase a transponder for about $12. They will also need to set up a prepaid account from which their tolls can be deducted. Accounts can be prepaid with a credit or debit card. Alternatively, customers can prepay with cash at a WSDOT customer service center.

Low-income users are more likely than the general population to be without a credit or debit card and will need to prepay their accounts with cash. According to the telephone survey results, more than 25% of low-income respondents indicated that they would not be able to use a credit, debit, or checking account to prepay their account from which their tolls can be deducted. Traveling to a customer service center to prepay their accounts in cash may be difficult, especially for low-bridge users.

Limited-English proficient populations may have difficulty understanding the new system and how to acquire and use the electronic transponder. Although results from the surveys, focus groups, and Spanish-language interviews did not shed much light on this, social service agencies in the SR 520 travel shed have expressed concerns about the ability of limited-English proficient users to understand the system and acquire and use a transponder.

CONCLUSIONS

1. Tolling does present a burden to low-income families. However, for many low-income people who are juggling multiple jobs and child care, traffic delays may be more costly than the tolls.

2. In many communities – particularly the auto-oriented cities on the west coast of the United States – transit is not a viable option for low-income people.

3. Un-tolled routes may add substantial time and distance to the trip, which will increase the cost of the trip in the form of wasted time, wasted fuel, and wear and tear on the vehicle.

4. New technologies for collecting tolls may pose an additional burden on low-income and limited-English proficient people.

We also found that there are several pieces of the research puzzle that are still missing:

1. There is little research on the equity of congestion pricing compared to traditional forms of highway funding.

2. There needs to be more qualitative research on the benefits of congestion pricing to low-income people and whether they offset the adverse effects.

3. We have not evaluated the effects of system-wide tolling on low-income and limited-English proficient people.

4. Mitigation strategies – a critical part of ensuring the equity of congestion pricing – need to be fleshed out and evaluated before states and tolling authorities will consider adopting them.

Evaluate the Equity of Congestion Pricing Compared to Traditional Forms of Funding Highways

We conclude that congestion pricing presents a burden to low-income users because they will have to spend a higher proportion of their income on the toll. In other words, a toll that is the same for all users – regardless of income – is regressive.

To illustrate this, consider two fictional commuters who drive alone across the SR 520 bridge five days a week, 50 weeks a year. The first commuter works as a software developer and makes $65,000 a year. The second commuter works at a retail store and makes $17,600, which is at the poverty level for a family of three. If the toll is $3.50, both commuters will spend roughly $875 a year on tolls. This represents only slightly more than 1% of the higher-income driver's income, but nearly 5% of the low-income driver's income.

However, traditional methods of funding highways – such as gas, vehicle, or sales taxes – may be as or more regressive than congestion pricing. At this time, we know of only one

study that compares the equity of congestion pricing to other forms of funding highway construction and maintenance. This study was conducted by UCLA and is very specific to Southern California. We believe that the methodology used by UCLA could be adapted for other regions.

Examine Whether the Benefits of Congestion Pricing Offset the Adverse Effects to Low-Income People

According to WSDOT's interpretation of environmental justice guidance and policies, for a benefit to offset an adverse impact that disproportionately affects low-income people, the benefit also needs to disproportionately affect low-income populations. As mentioned earlier, our research found that for many low-income families, traffic delays are more costly than tolls. We need more qualitative research on the extent to which congestion pricing will *benefit* low-income people.

Because low-income populations are often found in the neighborhoods surrounding highways, we also recommend further research on the benefits of traffic reduction as a result of congestion pricing. For example, if congestion pricing should substantially reduce the number of vehicles on a given facility, there will likely be corresponding improvements to air quality, noise, pedestrian safety, and other benefits for neighborhoods adjacent to the project.

It should be noted that if traffic modeling finds that much of the traffic on the tolled facility will be diverted to un-tolled facilities, the neighborhoods surrounding the un-tolled facilities may be adversely affected. These adverse effects will need to be identified and mitigated. If the affected neighborhoods have low-income or minority populations, the effects will need to be documented in an environmental justice analysis.

Identify the Effects of System-Wide Congestion Pricing

The research documented in this report was conducted for an environmental justice analysis of tolling on one facility: the SR 520 bridge in Seattle. At this time, there is serious discussion of implementing congestion pricing on some or all major highways in the Puget Sound regions.

Because so many low-income people plan to rely on un-tolled routes to avoid paying tolls, without careful attention to mitigation, system-wide pricing could have profoundly adverse effects on low-income people.

Flesh-Out and Evaluate Mitigation Strategies

Meaningful mitigation is critical to ensuring that tolling is equitable. States and tolling authorities are examining a number of mitigation options, including

- Using tolling revenues to improve transit service, especially along routes that serve low-income people
- Using tolling revenues to subsidize tolls for low-income drivers and/or social service agencies that serve low-income people

- Providing free transponders

There are advantages and disadvantages to each of these approaches, as well as equity and administrative concerns. Furthermore, states and tolling authorities will be wary of establishing precedents by adopting aggressive mitigation that has not been time-tested.

Therefore, we recommend that US Department of Transportation (USDOT) consider taking the lead on evaluating and pilot testing mitigation strategies.

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[i] U.S. Department of Transportation (USDOT) Order 5610.2.
[ii] USDOT Order 5610.2, §5(b)(1).
[iii] Federal Highway Administration (FHWA) Order 6640.23.
[iv] U.S. Census Bureau Summary File 1, 2000.