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The Triple Bottom Line and Wastewater Planning in San Francisco: A Tool for Environmental Justice?

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Wastewater planning adversely impacts disadvantaged communities in many U.S. cities. Utilities use Triple Bottom Line (TBL) tools to try to achieve sustainability goals, but these plans often fall short in their pursuit of social justice. This paper shows the process, potential, and limitations of a TBL approach for environmental justice using the San Francisco Public Utilities Commission's wastewater plan as a case study. It finds that ongoing wariness about how planners use the TBL is merited: use of the tool does not necessarily lead to social justice. Yet actors did use the ideal of sustainability as a strategic opportunity to pursue equity goals.

INTRODUCTION

Planners today are tasked with prioritizing the often-conflicting interests of economic development, protecting the environment, and being socially responsible. This set of goals is often referred to as balancing the three Ps, "people, planet, profit," or the three Es, "economy, environment, equity." General Plans and Specific Plans increasingly apply sustainability as a guiding principle for their land use strategies (Wheeler 2008). In other cases, jurisdictions have opted to select and track progress for indicators across a range of issues. Still others are using sustainability frameworks to assess and compare project alternatives. These approaches have involved the development of analytical methodologies; among them, the Triple Bottom Line (TBL). As will be discussed in more detail below, TBL is an accounting framework that considers social, environmental, and economic priorities. Planners are creating analytical tools based on the TBL framework to compare how projects fare when evaluated under each goal. TBL tools, their users maintain, have the potential to fairly and transparently put an agency's sustainability priorities into practice.

At the heart of debates surrounding the concept and potential of sustainability is the question: what is being sustained and for whom? The development and adoption of TBL tools to deliver sustainability is of concern for planning education and research, because sustainability planning initiatives often fall short in their pursuit of social justice (Saha and Paterson 2008). Users of TBL often quantify and standardize tool criteria to objectively and consistently assess the merits of different planning projects. Yet quantification and standardization can mask the political and contextual nature of planning, leading to the creation or compounding of social and economic inequalities.

Water utilities are among those adopting TBL tools (Kenway, Howe, and Maheepala 2008). As revenue-generating agencies, utilities' economic priorities are often defined by their obligation to balance large budgets with operations and maintenance costs. Their social impact is large in scope and scale: the provision of water and wastewater services is a tremendous public service. But utilities have also been known to create or compound public health and safety hazards in low-income communities of color.

This paper engages the concerns about the social justice aspect of the TBL, as well as critiques of standardization and quantification in the use of analytical planning tools, to query if TBL use can yield greater social justice. Employing the San Francisco Public Utilities Commission's (SFPUC) use of the TBL as my case study, I show the process, potential, and limitations of a TBL approach for environmental justice in the city's wastewater plan. This paper approaches environmental justice using Schweitzer and Valenzuela's (2004) classification of environmental justice, which considers the unfair distribution of burdens, as well as the unfair distribution of protections or amenities. Both categories are critical, because wastewater planning can generate both burdens and assets. Data were collected through interviews conducted in 2016 and primary documents dated from 2011 to 2015. Findings call attention to how sustainability tools in the field of planning impact some of our cities' most vulnerable residents.

WHAT IS THE TBL AND WHY DO UTILITES USE IT?

TBL builds on the business accounting concept of the "bottom line," or the net income. A bottom line is typically a numerical figure—located at the end of an extensive calculation—that accounts for expenditures and revenues. The TBL is often applied as an elaborated version of cost-benefit analysis, a policy and planning decision-making aid formalized by US government

agencies to select infrastructure projects (Porter 1996). Today, cost-benefit analysis is used by many planning organizations, including those in the areas of energy, transportation, and water.

The Triple Bottom Line is similar to cost-benefit analysis in that it ascribes value to different parts of a planning project to deduce an overall assessment: "The TBL is an accounting framework that incorporates three dimensions of performance: social, environmental and financial. This differs from traditional reporting frameworks as it includes ecological (or environmental) and social measures that can be difficult to assign appropriate means of measurement" (Slaper and Hall 2011, 1). Organizations adapt the TBL framework to create analytical tools that guide decision-making. This involves identifying the criteria or indicators that form the basis for analysis in each of the TBL's three priority areas. The criteria or indicators are then ascribed a certain value. The values for all the priority areas are combined to generate an assessment of the options available to the organization. The Triple Bottom Line framework emerged as part of corporations' move toward self-regulation. The 1990s saw heightened environmental activism that challenged processes of globalization and the lack of government regulation. Businesses adopted TBL as a pledge to balance the environmental and social impacts of their operations with desired levels of revenue. Elkington (1997) coined and popularized the TBL through his consulting firm and book, *Cannibals with Forks*.

Water utilities are among those organizations that are turning the TBL framework into an analytical tool (Figure 1). The trade organization Water Research Foundation encouraged water utilities to use the TBL with its 2008 report, "TBL Reporting of Water Utility Performance" (Kenway, Howe, and Maheepala 2008) The report upheld TBL as a vehicle to improve public disclosure processes, a critical function in the highly regulated industry. Liner and Monsabert

(2011) argue that the TBL has potential to balance interests and generate alternative solutions for water utilities.

Triple Bottom Line Evaluation Criteria in San Francisco		
Financial • Capital Costs • Other Costs* *Includes operations and maintenance, replacement and renewal, avoided costs, and new revenues.	**Environmental** • Climate • Air Quality • Water Quality • Water Use • Habitat • Natural Resources Inputs	**Social** • System Resilience • Ratepayer Affordability • Employment • Bicycle and Pedestrian Environment • Recreation and Open Space • Cultural Resources • Odor • Noise • Land Use Adjacency • Construction Impacts • Worker Safety

Figure 1. The "triple bottom line" of benefits (Kubick 2015)

Utilities are developing and appropriating TBL methodologies to select the best project alternative for a wide range of water planning needs. Northwest Washington's King County TBL tool was used to compare alternatives for its Combined Sewer Overflow Control Program, as well as those it collaborated on with Seattle Public Utilities (Hadler and Pecha 2010). The El Paso Desalination and Reuse Agency used the TBL to examine water supply options – water reuse, desalination, and importation (Piper 2014). The agency's approach involved quantifying and monetizing financial, environmental, and social outcomes of four alternatives. The analysis, which projected 50 years into the future, showed a savings of nearly $1 billion through reuse and desalination. Social benefits were expected to exceed $2.4 million (Raucher, Archuleta, and Reinert 2014). The Philadelphia Water Department has also used the TBL to examine alternatives for controlling Combined Sewer Overflows (Stratus Consulting 2009). These utilities maintain that their TBL approach forms part of their commitment to sustainability, and that it reflects a shift away from pursuing simply economic interests.

DEBATING THE TBL

Studies show that sustainability plans tend to fall short in their pursuit of social justice. Saha and Paterson's (2008) survey of 216 cities in the United States shows that local governments tended to define sustainability in terms of their environmental and ecological priorities and that they rarely connected these to social justice. Haughton (1999) points out that core principles of sustainable development – e.g., geographical and social justice – are missing from sustainable development planning. Others ascribe this "equity deficit" (Agyeman 2005) to the environmental movement's assumption that, by helping the environment, they are helping everyone (Agyeman 2013). For Gunder (2006), the lack of social justice goals in sustainability plans is a reflection of the emptiness of the concept: its all-encompassing nature has been co-opted to promote established market interests. Scholars have challenged the separation of "green" and social justice agendas by arguing that alternative economic and social models are required for a greener world (Harvey 1996; Langhelle 2000). On the other hand, many remain cautiously optimistic about the potential of drawing on the ideas and practices of both sustainability and environmental justice to forge a more transformative and normative framework in planning (Agyeman and Evans 2004; Schrock, Bassett, and Green 2015).

The tools used by planning agencies to operationalize sustainability can yield insight into how social justice features in sustainability initiatives. Frost, Adams and Weber (2004) point out the dearth of research in accounting for social issues, compared to environmental ones. More significant, Henriques (2004) notes, has been the challenge of how to quantify and monetize these bottom lines, since they are often comprised of "intangibles." A similarly critical view is offered by Norman and MacDonald (2004) who maintain that TBL deters users from achieving

actual corporate social responsibility; it is about "as far as you could get from the paradigm of the accountant performing calculations on the basis of verifiable figures and widely accepted accounting principles" (Norman and MacDonald 2004, 10). These critiques are reminiscent of those that challenged cost-benefit analysis. The institutionalization of cost-benefit analysis allegedly allowed for technical uniformity, thus projecting fairness. But the variables entered in cost-benefit analyses, and whether they are categorized as a 'cost' or 'benefit', are a reflection of a set of values and preferences (Dryzek 2005, Sagoff 2007).

Even if quantifying social standards was possible, others explain, using the same indicators or criteria across time and in different places presents grave concerns. For TBL proponents, standards are desired because they allow users to understand contextual differences, and they allow for time series analysis, professionalization, and transferability (Baxter, Bebbington, and Cutteridge 2004, 131). But standardization presents a conflict for stakeholder groups that want to hold an entity accountable for particular environmental and social concerns. In other words, there may be "a tension between stakeholder engagement for TBL reporting and the comparability and consistency opportunities that come with standardization of reporting" (Adams, Frost, and Webber 2004, 24). Specific stakeholder interests that might be debated include community outreach, workforce opportunities, and climate change adaptation. Since introducing the concept, Elkington (2004) has acknowledged that the TBL is in its nascent stages; a more thorough approach that considers context, multiple priorities, and involves a wider range of stakeholders is needed.

TBL & DISTRIBUTIVE JUSTICE IN SAN FRANCISCO

San Francisco boasts many markers of economic success, including a low unemployment rate – the city and state unemployment rates are 3.5% and 6.2%, respectively (U.S. Bureau of Labor Statistics 2015). But many residents of color and low-income residents are encountering an increasingly untenable cost of living or live in some of the city's persistent pockets of poverty (San Francisco Department of Public Health 2012). Many of these residents experience poorer health outcomes which have been linked to the cumulative impact of environmental hazards and social stressors (San Francisco Department of the Environment 2006). Thus, we need to understand how planning mitigates or compounds disparities that adversely impact low-income communities and communities of color.

San Francisco's residents are all served by one sewer system. It consists of over 25,000 catch basins, 1,000 miles of sewer, three treatment plants and 27 pump stations. The system collects and treats up to 575 million gallons of wastewater in a day ("San Francisco's Wastewater Treatment Facilities" 2014). But the system is aging and needs changes to prepare for climate change and earthquakes. In 2011, the SFPUC embarked on the Sewer System Improvement Program (SSIP), a $6.9 billion program, with a 20-year implementation schedule. Under SSIP, improvements will be made to the treatment plants as well as the collection system, which deals with the collection and movement of water. The SFPUC designed a TBL tool for SSIP to assess alternatives, provide decision-making support, and enhance transparency and reporting (Kubick 2015).

The SFPUC's water infrastructure projects, like those in other cities, are regulated by state and federal policy. In San Francisco, water infrastructure maintenance and repair are also regulated by an equity framework set forth by two progressive policies passed by the agency's

Commissioners. The 2009 Environmental Justice Policy commits the agency to principles that "prevent, mitigate, and lessen disproportionate environmental impacts of its activities on communities in all SFPUC service areas…" The 2011 Community Benefits Policy obligates the agency to the development of a Community Benefits program to "ensure that public benefits are shared across all communities." The Community Benefits program that the agency leadership subsequently created consists of a team of several Program Managers, each with different policy and programming foci.

This paper examines whether and how environmental justice concerns are incorporated in the SFPUC's TBL tool. Project planning and evaluation methods in San Francisco's water planning contain important implications for the city's low-income residents of color. Most notably, the lynchpin feature of the wastewater system is a treatment plant located in Bayview Hunters Point, a historically African-American neighborhood that processes 80% of the city's wastewater. Residents have long complained about odors and noise that emanate from the plant, as well as the facility's visual impacts on the neighborhood ("Review of the Biosolids Digester Facility Project by the Southeast Digester Task Force for the San Francisco Public Utilities Commission" 2010). More recently, flooding has become a concern in several neighborhoods.

To determine whether use of the TBL resulted in distributive justice, this paper applies Schweitzer and Valenzuela's (2004) classification of environmental injustices as costs or benefits. The framework deviates from the more widespread conceptualization of environmental injustices as the burdens that result from environmental decision-making (costs), because it also deems an injustice the protections or amenities that are not fairly distributed (benefits). As part of SSIP, new, coveted green infrastructure is being developed, including rain gardens, green bulb-outs, and permeable pavement. These assets provide aesthetic and recreational benefits. In the

case of wastewater planning in San Francisco, both the location of the treatment plant and the distribution of green infrastructure, an amenity, are matters of concern for environmental justice advocates.

Methods

This case study involved two data collection methods: interviews and analysis of primary documents. Between January and July 2016, I interviewed 11 people who were or are engaged in the development or implementation of the agency's TBL approach. Interviewees included SSIP project managers and directors, primarily mid-level engineers; SSIP consultants, some of whom helped developed the TBL and trained the agency's project managers; and members of the SFPUC's Community Benefits team. Interviews lasted on average 50 minutes. All interviews were transcribed and coded and were audio-recorded with the interviewees' permission. Interview data provided insight into interviewees' views on whether and how the tool addresses environmental justice. The primary documents analyzed included memos that agency staff wrote for the agency's Commissioners; meeting minutes from the agency's Commission and Citizen's Advisory Committee meetings; and PowerPoint presentations that discussed the TBL at these meetings. All of these documents are publicly available and were accessed through the Internet. Primary documents are dated 2011 to 2015, since planning for the development of the agency's TBL began in 2011 and implementation, which is ongoing, began in 2014.

My previous role at the agency allowed me to generate the list of interviewees and identify relevant documents. From 2013-2015, I served as a part-time staff in the agency's Community Benefits division. I did not work on TBL during my tenure, however, I frequently heard of the TBL approach from fellow employees and through internal agency communications.

A Tool for Environmental Justice?

The SFPUC adopted the TBL tool for the purposes of: informing and supporting the process for developing project alternatives; decision-making support; project selection transparency and reporting to the public (Quinn 2014b). The agency began to design the methodology in 2011, and agency consultants started to train staff how to use it in 2015. To date, project managers and consultants have run approximately 700 projects through TBL, each containing at least three alternatives.

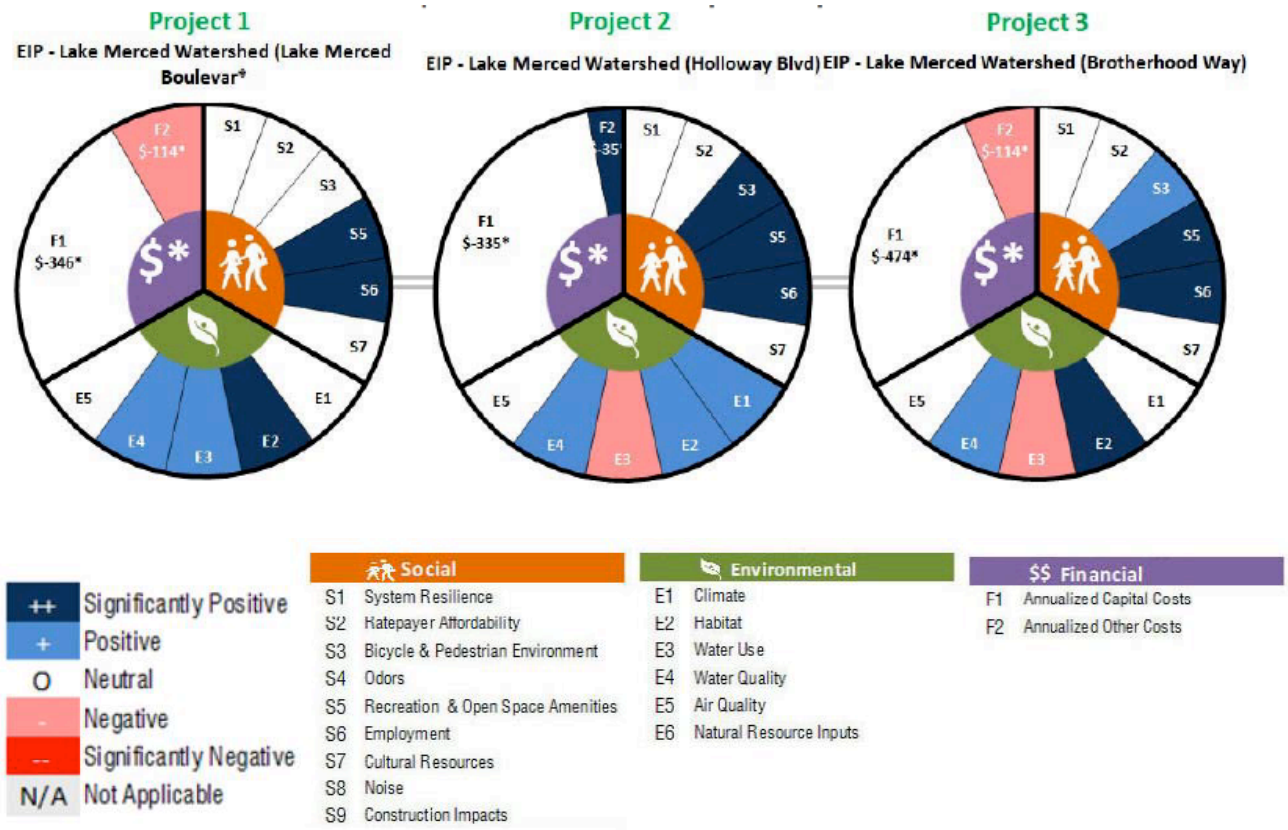

Figure 2. TBL Output of Lake Merced Watershed (Wood and Wilson 2013)

The SFPUC's TBL approach presents an opportunity to understand how the agency is addressing environmental justice concerns with the tool. TBL is used by approximately 15 SSIP project managers to determine "what impact the potential range of solutions may have on the city, ratepayers, and the environment" (Kubick 2015). They upload details and features of each alternative onto a TBL software program. The interface bases its analyses on an assessment about how each alternative meets metrics for social, environmental, and financial criteria. The TBL tool output then shows how each alternative is rated on these criteria (Figure 2).

The Project Managers use the TBL tool after project alternatives have been selected (Figure 3). Several Project Managers pointed out that many decisions shaped which suite of alternatives and projects were developed. The Sewer System Improvement Program's $6.9 billion budget, for example, had been approved by agency commissioners in July 2012. One interviewee noted,

> The decision to even undertake the SSIP was one macro-level decision. And then they had to decide what SSIP was going to be made up of, and then they had to decide, conceptually, we're going to have capital projects that address the Southeast Plant and then the other half are all those collection systems. That's already a decision-making point. Then, the next is how much is our budget, and how much of that budget is going to be allocated to the two components – the plant versus the collection system. And then the other decision making points were… Of those collection systems, how much is going to green infrastructure versus grey.... All these points happen before TBL.

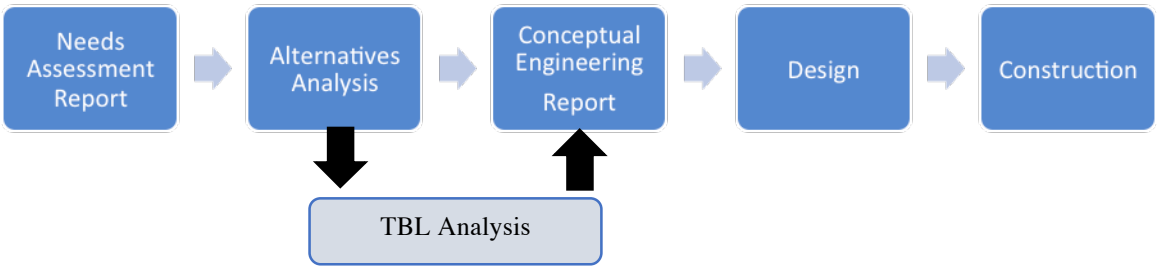

Figure 3: When TBL was applied in the planning process in San Francisco (Adapted from Quinn 2014a)

Despite some of the pre-determinations that shaped which projects and alternatives were run in the TBL tool, environmental justice was, to some extent, factored into the process of selecting among alternatives. The SFPUC used the TBL in two ways that incorporated environmental justice concerns, and I will show how their approach aided in the decision to site the Holloway Green Street in the Ingleside neighborhood, a historically Asian and Latino, as well as low-income, neighborhood.

Prioritizing the Alternatives: Spatial Analysis and a Tiered Approach

In 2013, the agency's Environmental Justice and Land Use Manager Yolanda Manzone authored a memo in which she proposed a method for incorporating environmental justice priorities in the alternatives selection process. The recommendations included a spatial analysis and tiered approach to prioritize the alternatives that benefit low-income communities and communities of color. The spatial analysis consists of locating the various alternatives on maps of San Francisco's "disadvantaged communities," defined by places that meet four out of eight disadvantage factors, such as poverty levels and unemployment. "Environmental justice areas of concern" (EJ areas of concern), which are also identified, account for similar socio-economic characteristics, as well as whether residents are disproportionately burdened by environmental health hazards. The spatial overlay of disadvantaged communities and EJ areas of concern is concentrated in the city's east and southeast neighborhoods. The memo recommended that Program Managers flag which projects fall within or outside of the relevant areas. The proposed next step was to use a tiered approach to decide which projects to prioritize and run in the TBL tool.

> Tier 1: Address needs in EJ and disadvantaged communities first.
> Tier 2: Develop project concepts that provide health and safety improvements and support interagency/citywide goals.
> Tier 3: Consider additional benefits supported by community input (Manzone 2013).

The approach placed a premium on the potential advantages and disadvantages created by the projects in EJ areas of concern and disadvantaged communities.

The recommendations were adopted in planning for SSIP's collection system. The collection system includes new green infrastructure, which is considered a community asset; its aesthetic and recreational qualities are improvements from conventional gray infrastructure. Project Managers, in consultation with members of the Community Benefits team, used the spatial analysis and tiered approaches to prioritize which alternatives were ultimately run in TBL.

The agency was able to incorporate the spatial analysis and tiered approach in the TBL process due to the input of members of the Community Benefits team. An agency Project Manager emphasized their crucial role in ensuring that the projects selected reflect social justice priorities:

> If there was no one with an explicit charge to implement the EJ policy and make sure it was tangibly integrated into our decision-making processes… a lot of things would be really different. There would be no geographic spatial awareness. We wouldn't have moved the needle to educate our own staff about the issues… The maps and talking about it, that's the beginning of education.

Here, the Project Manager refers to differences in roles and professional background within the agency, further pointing out that the maps made the consideration of community impacts "tangible" for the engineers and consultants.

Yet the spatial analysis and the tiered approach were not applied to all SSIP alternatives that were ultimately run in the TBL tool, since this process was mainly applied to the collection system improvements. Many projects that do not fall in that category were already slated to undergo improvements. This includes existing infrastructure that needs to be repaired, such as treatment plants; in these cases, site location is not necessarily a choice. A Program Manager noted, "It's not like you can choose to do that project in that location or not, at that point,

because the location is already chosen. And because the policy was written and started to be implemented for [the collection system], versus projects..." Another Project Manager lamented this project pre-determination, expressing interest in the possibility of using TBL for all projects, not just those that form part of the collection system.

Running the Alternatives in TBL: Contextualized Criteria

SFPUC project managers and their consultants debated which social criteria and related metrics to use. At the onset, they planned to use quantifiable criteria that they selected. But they were pushed by former General Manager Ed Harrington to use a method that did not try to dictate San Franciscans' values. Alexander Quinn, a chief TBL architect, noted this shift in approach:

> We recognized that nothing that the staff said was of really that importance, nothing that I said was of that importance, what mattered was the policies that were already established by adopted bodies in city government or the state level. So we hung our hat on all the things that were already established, and that really enabled us to have some credence, weight, relevance.

SFPUC officials and their consultants subsequently engaged in a twelve-step process to develop the criteria (Kubick 2015). This included the development of draft criteria and related metrics for TBL that were reviewed by an internal agency working group; criteria were then reviewed by sub-working groups and were revised based on this feedback. The working groups included officials from other city agencies to ensure that the criteria were aligned with their respective priorities, including the Departments of Public Health, Environment, Parks and Recreation, and Economic and Workforce Development. SFPUC Community Benefits team members were part of the working group.

The SFPUC's Environmental Justice and Community Benefits policies (2009, 2011) also informed which criteria and metrics were selected. SSIP's overarching mission—known as the Levels of Service – was decided on in 2010 and reflect these priorities: to "provide benefits to

impacted communities," by providing "both economic and job benefits to the communities it serves." A Community Benefits Manager noted that Assistant General Manager Juliet Ellis made this goal explicit in the mission and that the policies gave team members the leverage necessary to pursue environmental justice considerations in the discussion pertaining to the TBL. The Community Benefits Manager noted, "There were anchors very, very high at the upstream—the EJ policy and these Levels of Service goals – and so we wanted to complete the spectrum of where those decision-making points and levers are. The specific Level of Service goal related to this was really important."

TBL evaluation criteria and metrics that reflect agency and citywide policies include odor, noise, and employment. Odor has been a major point of contestation for several decades because it is a problem associated with the treatment plant in Bayview Hunters Point. Residents in the neighborhood have contested the utilities' operations since the 1970s, when the plant was built. Moreover, the jobs made available through water infrastructure planning are highly desirable, because they can provide career pathways for "middle-skilled" workers, including low-income people and people of color (Gordon et al. 2011). Air quality is also measured in the TBL, as well as recreational and social space, which is of crucial importance to low-income communities.

SFPUC officials noted that the various traditional uses of TBL, such as financial cost-benefit analysis and monetization, resulted in "false precision," or high standard error when Project Managers estimated key performance indicators of infrastructure investments. Instead, the officials opted to apply an evaluation system for the criteria evaluated for each project (Table 1). Each individual criterion is rated as a positive or negative with five rating options from ++ to --. The reason for this, according to a TBL consultant, is to "[Help] project managers decide

which alternative they should really select and explain how they arrived at this alternative" (SFPUC Citizens' Advisory Committee Wastewater Subcommittee 2012, 2). The TBL is thus not used to generate the output of a single score, nor does it rank the evaluated projects.

SFPUC consultant Alexander Quinn, Director of Sustainable Economics, made a case for how the agency's use of the TBL differs from conventional uses: "This model is unique to San Francisco. There are other models out there and a lot of them deal with monetizing the environmental and social costs. The application was brought up to San Francisco…. This is an SFPUC model" (SFPUC Citizens' Advisory Committee Wastewater Subcommittee 2012). The SFPUC's TBL method is uniquely contextual. Its social criteria and metric development method incorporates the local codified priorities, and the rating system enables Project Managers to choose a preferred alternative. The agency was able to do this because it pulled expertise from various city agencies, as well as different parts of the SFPUC, including the Community Benefits team.

The TBL criteria and metrics, however, are not examined in relation to the conditions of low-income communities of color. One project manager notes, "EJ considerations are secondary to system considerations. That does provide good to everybody, but it's unclear how much choice there would be for disadvantaged or environmental justice areas." Rosey Jencks, an agency official, noted, "equity metrics are not in the tool. You could put EJ and disadvantaged communities in there and spend time [developing] equity metrics."

Even as the criteria and metrics reflect some environmental justice concerns, factors such as race and income are not considered in the tool. Although the SFPUC did factor these in to some extent prior to using the tool, the TBL tool endorses a logic of equality, not equity. This is an important distinction. Equality is a notable normative goal, but it does not address existing

disparities. In American cities, not taking disparities into account results in ignoring existing marginalization at best, or compounding it at worst. The SFPUC factored in these differences to some extent *prior* to using the tool.

Holloway Green Street

The planning and development of the Holloway Green Street Project is an example of the agency's use of social and spatial analysis, as well as a tiered approach, to generate a more equitable outcome in the city's stormwater management. The project, under construction at the time of writing, spans eight blocks along Holloway Boulevard in the city's Ingleside neighborhood. Residents there are predominantly Asian and Latino, and many are low-income. A project consultant noted the value of the project to the community: "Part of the benefit of doing a green street, is that, while it is serving a technical, functional purpose in benefitting the sewer system, it is also hopefully a public amenity, it's a street beautification and ancillary benefit in putting in vegetation." Indeed, the Holloway Green Street includes permeable pavement and rain gardens, features that are expected to improve the traffic safety and aesthetic quality of the corridor.

In the early stages of planning, agency officials and consultants identified seven street corridors that were "candidate locations" for a green infrastructure project in the local watershed (Wood and Wilson 2013). These candidates were identified through an analysis that concluded that the projects were physically feasible and that they addressed system needs. At this point, project managers applied four social and environmental indicators, in a tiered approach, to determine which projects to run in the TBL tool: EJ areas of concern, disadvantaged communities, open space need areas, and injury corridors. They determined that none of the projects were located in EJ areas of concern, but two were located in disadvantaged

communities: the projects on Holloway Avenue and Lake Merced Boulevard/Sunset Boulevard. Both projects, and a third, became those ultimately run in the TBL tool (Figure 2). The project on Holloway Avenue emerged as the preferred project from a TBL perspective. A project consultant explained:

> The disadvantage to a tool like [the TBL] is that if you haven't put some thought in ahead of time, we could have just picked a project that didn't hit any of [the disadvantaged] areas at all, and then running it through TBL there wouldn't have been any value gained to a disadvantaged community or an environmental justice community, because we hadn't been there to start.

FOR DISADVANTAGED COMMUNITIES… AND EVERYBODY ELSE

The SFPUC's methods for incorporating environmental justice in the TBL methodology contain three important implications for planning education and research. First, this paper supports existing research which has found that the ideal of sustainability presents a strategic opportunity to pursue social justice goals. The analytical process to incorporate environmental justice occurred *before* alternatives were run in the tool. One Director pointed out that this was in part done because, when it came to the achieving equity goals, "the TBL tool wasn't going to get us there… It'd be too late by the time projects got there." The analysis is thus an additional step in the planning process, not a technical method intrinsic to the TBL.

How the SFPUC was able to achieve environmental justice to the extent they did contributes to our understanding of the conditions that enable the incorporation of social justice goals in sustainability. The expertise to design the spatial analysis and tiered approaches came from the Community Benefits division in the agency, or those with an explicit mandate to ensure that the agency meets its environmental justice and community benefits goals. The Community Benefits Program Managers provided a working definition for EJ areas of concern and disadvantaged communities, and they advised and made recommendations about how to

prioritize projects that would benefit low-income communities of color. The SFPUC's development and use of the TBL thus points to the important role of internal capacity in structuring the social justice goals of a water utility. This included the role of the utility's Community Benefits and Environmental Justice policies and leadership. But in-house and citywide expertise on environmental justice is lacking in the work of most utilities, given their strong engineering orientation. Developing internal capacity is at once a challenge and a clear way forward.

Second, the case points to potential limitations of TBL tools for social justice efforts. Tool designers rightfully refrained from using quantification and standardization methods that yield "false precision." The TBL model's use of local policy means that TBL analyses account for a wider range of priorities than might be typically ascribed to a utility, and the criteria and metrics used reflect local priorities. In this respect, the SFPUC's TBL model is likely more comprehensive than TBL tools used by other public agencies. But the criteria and metrics are equally considered for all San Francisco residents, not those that bear particular environmental burdens. The equal application of criteria and metrics should not come as a surprise, since the utility provides a public service to an entire jurisdiction. It does, however, reflect a classic tension in infrastructure planning and maintenance: when a public service for the general population creates burdens for a select few. The tool thus neglects the cumulative impact of exposures experienced by low-income communities and communities of color. This challenge to the use of metrics and criteria reminds us that such analytical tools are neither objective nor rational. Organizations that do not formulate environmental justice considerations into the TBL process may be failing to directly address exposures to environmental hazards and may even compound them.

Finally, the type of justice that is achieved with TBL tools will vary, depending on the infrastructure project and its purpose. The types of projects run through the TBL in San Francisco intentionally incorporate one type of environmental justice, according to Schweitzer and Valenzuela's framework. The distribution of green infrastructure – an amenity – was decided using the socio-spatial analysis and tiered approach and thus reflects environmental justice priorities. However, this approach was not taken for other types of infrastructure, including treatment plants, meaning that the "costs" of the system, those elements considered burdens, are not necessarily being distributed differently, because they cannot be relocated. Places like Bayview Hunters Point will thus experience an upgraded treatment plant, and TBL criteria and metrics will help select the best alternative, but the plant will not be re-located. This tension is a common example of how agency budgets and infrastructure system priorities can outweigh social justice concerns.

Despite some of the promising features of the SFPUC's use of the TBL, it is difficult to specify the extent to which it will contribute to the delivery of justice for the entire scope of the SSIP. There is no guarantee that the TBL tool will select the projects that fall in EJ areas of concern or disadvantaged communities. Furthermore, the alternatives recommended after the TBL analysis are precisely that – recommendations. It is ultimately up to the Commission and other agency leadership to decide which projects will be chosen. Further, it is possible that the agency is adopting or will adopt other methodologies to consider the social and economic characteristics of the neighborhoods it will most impact. For example, SSIP officials noted that community engagement is a central feature of their wastewater infrastructure improvement efforts. More research is needed to see how strategies like these support environmental justice.

CONCLUSION

Sustainability is often referred to as the balancing of the three E's or three Ps: "economy, environment, and equity" or "planet, profit, people." Neither readily captures utilities' sustainability efforts. In the first, "equity" is not always pursued, in part because of the tension between improving an existing infrastructure system versus addressing the distinct burdens in low-income communities of color. But nor do utilities "profit," as suggested by the second phrase, since these organizations provide a public service. This role makes them a critical site to understand how environmental burdens and amenities are distributed in cities, particularly in those with increasingly stark levels of inequality.

This paper aimed to do that by providing an overview of TBL tool use in San Francisco, and it queried if and how environmental justice considerations were made. Analysis of interviews and primary documents yielded three implications for planning education and research. First, utilities should not rely on TBL alone to achieve equity, but the tool can be used as a strategic site to pursue equity goals when internal capacity supports this effort. Second, the specific challenges of low-income communities and communities of color can be relegated when criteria and metrics serve the interests of residents as a whole. Finally, the case shows that different types of justice are implicated in wastewater planning – those that manifest as amenities or burdens – and can be pursued or achieved to different extents.

TBL tool use does not necessarily suggest a step toward, or even a commitment to, achieving social justice. Ongoing wariness about how planners use the TBL is thus merited. Wastewater agencies are developing methodologies to determine whether, and by how much, sustainability is achieved by different project alternatives. The history of wastewater planning

points to how decision-making tools can adversely impact low-income communities of color. As utilities move toward adopting new sustainability strategies like TBL, they will need to determine the potential, as well as the limitations, of these new practices for social justice.

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