

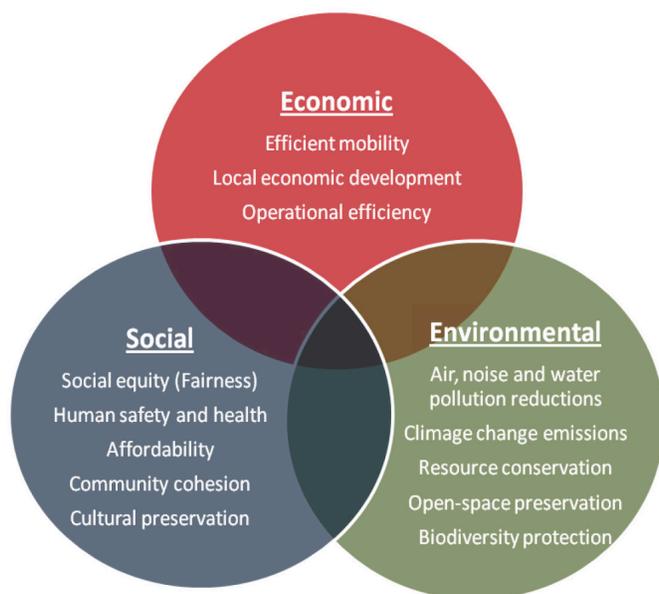
Building Sustainability Indicators for Transportation Plans

When it comes to measuring success in mass transportation, indicators are often tied to revenue dollars and ridership numbers, where the higher the number, the better the performance. Such indicators are not too heterogeneous from the automotive industry where net profit and vehicle supply are common Key Performance Indicators (KPI's).¹ Stark revenue and ridership numbers may not be the most accurate or comprehensive rubric for judging transit performance, especially considering the diversity of contexts of operation, scales of organizations and this time of climate change. While the car industry is getting better and better at low-emission vehicle engineering, it is still, by far, no comparison to a heavily-used, circulating mass transit system in carrying more people with less vehicle mass, usage of space, consumption of energy, and production of waste, because the ride is shared. The more passengers regularly complete journeys with a train or bus, the more efficient it is as a transportation mode. Its efficiency is further bolstered when customers carpool, walk, or cycle to their first station stop — active behaviors habitual to transit patronage.

Thus, beyond counting ridership and revenue dollars, transit agencies would do well to recognize and hone their special contribution in mitigating negative environmental impact, in increasing its preference as the transportation mode for a diverse community (i.e. age, race, ethnicity, income levels, genders, physical ability, etc.), in keeping it competitively priced, and in delivering riders to destinations where they can thrive, whether it be to school, employment centers, home or recreational locations.

Considering the panoply of purposes an effective mass transit system offers, transit agencies can more thoroughly and accurately evaluate and gauge their work through the broad lens of sustainability. Sustainability is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Livability refers to the subset of sustainability objectives that directly affect community members. Sustainability and livability generally support similar planning objectives, but not always. Furthermore, sustainability is a long-term pursuit. Both support the aims of mass transit. Recent movements in sustainability practice in public works aim toward reduction and conservation of finite resources, in recognition of mass transit as a potential optimization of space, infrastructure, fuel, and time in ways that individual travel in

1. Pitcher Partners , p. 3.



1. Sustainable Transport Goals, the triple bottom line.
Courtesy Litman, Todd. p. 4.

personal vehicles do not achieve. These environmental benefits are very important but ecology is not the sole goal of transit. Ecological benefit is balanced with social and economic ones to produce a tenable dynamic. Why does sustainability triangulate the ecological, social and economic as interdependencies? Environmental protection is affected by economic and social activity, and vice versa. Unless we take a purely ecological approach which would subordinate human needs for the purpose of environmental restoration, it is a constant balancing act. Much

economic analysis is concerned with defining “efficient” allocations of scarce resources. In a sustainable model, economic efficiency is achieved when it is impossible to make one person or group in society better off without making another group worse off. In this paper, I would like to address the ways in which LA Metro is quantifying its sustainability metrics, how better sustainability indicators could be developed, alternative factors to consider, and reasons to innovate on the current sustainability indices of indicators, in terms of ecological economics, as a more appropriate and homeostatic model than standard, mainstream economics.

Sustainability Indicators at LA Metro

Metro abides by the APTA Sustainability Commitment matrices of indicators, a baseline structure designed for versatile application for all transit agencies and DOTs of various configurations and scales. The useful features of the APTA program include offering set-up support and guidance to the participating organization as well as identification and measurement methods for the APTA sustainability metrics. These metrics fall under the chief categories of water usage, criteria air pollutant emissions, GHG emission and savings, energy use (electricity, fuel), recycling levels/waste, operating expense, unlinked passenger trips per capita in service area of operation, and VMT per capita in service area of operation. In these categories, the amount of pollutants avoided and natural resources conserved is normalized or moderated with rider usage (i.e. the number of vehicle miles or passenger miles traveled). The combination reflects an overall ethos of pollution and waste reduction balanced with social benefit and cost effectiveness which correlates directly with the three-pronged (environmental, social,

APTA Sustainability Commitment Requirements by Recognition Level								
	Core principles		Action Items		Baseline reductions per indicator		Stretch Goals	
	Require	Commit to	Require	Commit to	Require	Commit to	Require	Commit to
Entry		✓						
Bronze	✓		5 ✓	+5		2 at 2%		
Silver	✓		10 ✓	+10	2 at 2% ✓	2 at 5% +2 at 2%		3
Gold	✓		20 ✓	+20	2 at 5% ✓ 2 at 2% ✓	2 at 10% 2 at 5% +all other at 2%	3 ✓	+3
Platinum	✓		40 ✓		2 at 10% ✓ 2 at 5% ✓ all other at 2% ✓	2 at 20% 2 at 10% +all other at 5%	6 ✓	+3

1. APTA's Sustainability Measurement system is tiered by levels of award. Applicants can accrue cumulatively, year after year, and rise the ranks of award. This system encourages continuous sustainability improvement. Graph is courtesy of APTA.

economic) strategy of sustainability.²

The APTA Sustainability Metrics is based on the lowest common denominator of indicators for all agencies. Therefore, agencies are advised to develop their own metrics in ways meaningful to and customized for themselves. In this regard, Metro has a tremendous opportunity to expand upon this fundamental set of sustainability measurements in ways that account for Los Angeles County's unique natural and urban setting and the special role that Metro occupies as transit operator, transportation planner, and program funder. So far, APTA has yet to calculate metrics for the distinguishing characteristics of each transit agency and its locale into its APTA sustainability performance equations. Once these are factored into the equation, then sustainability performances across different agencies can be compared more accurately and analyzed for further indicator development.³

Sustainability Indicators could be more valuable when they are standardized and weighted for unusual characteristics. The benefits include: 1. Pursuit of grants and funding. 2. Ease in aggregating data for larger analysis. 3. Ability to ladder up to regional level and ladder down to local level, for continuity. 4. Facility for longitudinal tracking of progress and projections. In the meanwhile, some challenges in creating consistent standards include: 1. Denial of the uniqueness of specific contexts—they are generic. 2. Failure to capture important idiosyncratic features that can affect action (such as particulate matter in the air in Lincoln, Nebraska versus San Francisco, which is right next to the ocean). 3. Exclusion of stakeholder engagement process, which deprives the public from engagement and public education experience. There is a way's to go.

In the spirit of focusing on sustainability by implementing these metrics, APTA also provides a suite of publications and online tools to arm participating agencies and transportation departments with familiarity and knowledge. Understanding the armatures of sustainability within the delivery of public service, transportation agencies can provide

2. Litman, Todd, p.4.

3. APTA, *Quantifying and Reporting Transit Sustainability Metrics*, p. 4.

accountability and transparency through their sustainability indicators. Stakeholders actually appreciate the opportunity to understand the interconnections between the different aspects of sustainability and transportation, particularly through dimensions of livability including safety, public health, stress reduction, etc. Per the EPA:

Many agencies have found that, once they begin to report sustainable transportation performance measures, stakeholders quickly see their value and come to expect regular reporting of measures and more explicit linkages between the measures and public agency decisions. Agency staff and stakeholders are then able to engage in a much richer conversation about the trade-offs among policy and investment decisions and the best opportunities for their region or state to reach its sustainability goals.⁴

The complexity of both the current and potentially greater role of transportation in a teeming cosmopolitan begins to unfurl when viewed through sustainability indicators.

For example, let us examine the old Caltrans mission statement: “Caltrans improves mobility across California.” Now, let us compare it to the new and current Caltrans 2015-2020 mission statement: “To provide a safe, sustainable, integrated and efficient transportation system to enhance California’s economy and livability.”⁵ The old mission statement seems uninspired and flatly matter-of-fact compared to the new one’s much more specific promise to California about the kind of transportation that Caltrans will deliver and the resulting societal benefits. The new mission statement acknowledges the need for goals with longevity and far-reaching positive implications across demographic and geographic strata, beyond the mere face value of transportation as infrastructure, service, and mode.

LA Metro’s goal embodies the concepts of livability without pinpointing it: “Metro’s mission is to provide a world-class transportation system that enhances quality of life for all who live, work, and play within LA County.”⁶ It does not state sustainability as a mechanism for producing livable outcomes and, instead, opts for “world-class” as the catalytic feature of its transportation, implying an adherence to general best practices in the public sector transportation industry. LA Metro does not identify sustainability as a strategy for addressing the most pressing social, environmental, and economic pressures of the day.

Todd Litman’s outline of key transport goals that align with sustainability goals demonstrate the expansive framework of sustainability and underscore its relevance as both a term and an ethos for articulating ambitious and comprehensive aims for public transit in today’s context. He includes: transport system diversity, system integration, affordability, resource (energy and land) efficiency, efficient pricing and prioritization, land use accessibility (smart growth), operational efficiency, and comprehensive and inclusive planning. With this set of categories, we see the reach of transportation’s tendrils into the

4. United States Environmental Protection Agency, p. 5.

5. Caltrans, p. 5.

6. LACMTA, p. 6.

vitality of a city at both the macro (community) level and the micro (individual) level through systemic, operational, economic, environmental, and social dimensions.

At a time when climate change is wreaking obvious havoc on continents, population is escalating particularly in the urban cores, and wealth distribution is polarizing, the opportunity for boldness in curbing these extremes is very much in the hands of all public works organizations, especially transportation. As such, it behooves each agency to research on not just best practices but innovative practices in sustainability measurement to propel our practice toward one that will help forge equilibrium between human activity and the natural system, access to opportunities for all, and encourage an equitable distribution of productivity and wealth now and for generations to come. To this end, LA Metro encounters an opportunity to develop sustainability indicators, apply them, and monitor them continually. To do so, LA Metro will have to research further the cutting-edge transportation sustainability practices and metrics of more advanced transportation systems in countries in Asia and in Europe, instead of primarily American ones, and implement more field work and engagement.

LA Metro needs to reach out to its partners in the County and beyond to identify common sustainability goals and opportunities to combine efforts to reach them. This step is not only pragmatic but also equitable and just, insofar as representing an array of voices accurate to the entire population and rallying interest and support through engagement.

Given the EPA's mention that stakeholders appreciate sustainability indicators as a prism through they can understand the intricacy of transportation's relationship with other aspects of society and the environment, it is important to organize and launch compelling community outreach programs that get participants to think innovatively, non-traditionally, and open-endedly. These participants need to include a spectrum of community members both who do and do not ride transit as well as those who like taking transit, dislike it, and have no feelings about it one way or another. This range captures patrons, defectors, and potential new customers and inspires them to effuse their impressions in such a way that formulates a deep and broad inventory of feedback for the agency's interpretation and analysis.

Traditional outreach efforts held at community centers on weekday evenings for two hours have not proven to be most effective and leave much improvement to be desired. Either few or only the usual suspects appear. To create a cutting-edge solution to sustainability indicator sets, every step of the process, including outreach, should be risk-taking and forward-thinking as well. One way is to think about time as both a finite resource and economically, as a form of currency. One could re-imagine the community meeting not as a detour from the stakeholder's normal pattern of life but one that integrates or intervenes into the established natural rhythms, such as canvassing at the laundromat, including a children's component in the outreach event so that entire families feel welcome, or during reading time at the local community library. In this way, the outreach is

philosophically aligned with the goals of sustainability, in terms of the economics of time and perceived social benefit to everyone.

It is important to note that time is truly a limited resource and a kind of wealth. Research highlights the complex relationship between well-being, sustainability and people's relationship to time, which is greatly affected by socio-economic status. To pursue social and environmental sustainability, a transformation in the way in which activity times are structured becomes necessary. Indeed, in addition to financial inequality, one major inequality regarding gender and socio-professional groups is the financially-influenced inequality of control over time. A paradoxical economic phenomenon occurs: The poorer one is, the less their time is worth monetarily and the less free time they have of it. Educating oneself and participating in the civics that advances sustainable processes requires having available time. Sustainability issues also include equity issues when demographic segments lack the ability to participate in the very matters that are meant to improve their lives. As they are, outreach programs are tacitly and inadvertently catering to the leisurely and those who can afford it. The current models are maintaining the status quo structure of power and opportunity.⁷

What are the other ways in which the outreach program disadvantages certain groups right off the bat, aside from time? These include the location and type of venue and whether it is perceived as elitist or welcoming, particularly to children and mothers. Another way is what languages are spoken or supported, a concern of residents who do not feel fluent in English.

Agencies should consider meeting people where they are and where they go in their routine lives and communicating the information to them in perspectives that matters to them, especially in multiple languages if English is not the audience's primary language. Additionally, participatory methods can produce a more well-rounded assessment of the impact of a policy intervention by starting from a more open-ended framework. Such would propose open questions about what people believe have changed in their transportation and their communities and elicit them to articulate what they think has caused these changes, as opposed to coming right off the bat from a policy intervention approach. Such questions cause administrators to pursue their investigation without any pre-conceived solutions and definitely not ones that simply need political support. This line of investigation is a self-guided one where the right answer manifests organically through the personal input of participants and, by way of this method, they also contribute to the creative process of devising the solution.

The Delphi Survey also embarked on a very loosely structured format, for the ultimate purpose of triangulating performance metrics, strategic transportation outcomes, and organizational features that drive these strategic outcomes. The Delphi Survey was an exhaustive process that begins with open brainstorm and distills the raw ideas into carefully weighted and hierarchically ranked list of indicators. To be sure, the Delphi Survey

7. Ottaviani, Fiona, p. 5.

researchers had to exercise their own subjectivity in interpreting and ranking the high-volume inventory of stakeholder input. For this, they also devised criterium so that a level of standards and consistency applied to all input. Their work yielded more depth than breadth but also revealed the imperative for public transit agencies to collaborate across disciplines and departments in order to succeed on the performance indicators that stakeholder input outlined.

To challenge ourselves to be true leaders in sustainable transportation and in addition to rethinking outreach tactics, LA Metro could also merge the APTA sustainability indicators with a new set of indicators built from scratch, to customize the set. LA Metro would need to accept the potential for cross-departmental issues to arise and the cross-departmental goals that will result. The inherent nature of sustainability is interdisciplinary.

The agency could also adopt an open-ended outreach format and be prepared to translate the qualitative sustainability aspirations into quantifiable measurements and actions. From there, the procedure would be more familiar and systematic. One would start by identifying the current Baseline (or benchmark). Then the Goal would be stated – what the agency wants to achieve at the bottom line. Objectives would be set – actions that help achieve goals. Finally, measurable Targets, based on Indicators, would be enumerated and would measure progress toward an objective. Indices based on groups of indicators would be aggregated into a single value, for drawing high level conclusions.

There are some dangers, traps and pitfalls that need to be heeded when developing sustainability indicators. When devising them, it is important to watch out for pitfalls and obtain balanced measurements. Economic measurements are easier to set because they are by nature quantifiable. It is important to balance these with environmental and social measurements, which are more difficult to quantify and measure. For example, how does one measure community cohesion? Native plant and insect life restoration? One must solve this problem and creatively identify indicators. Likewise it is also important to think about overlooked or inadvertently omitted factors, such as climate change. For example, from an ecological standpoint, during drought does water conservation during also contribute to avian wildlife death due to lack of water sources? Or, from a social standpoint, do the number of active transportation practitioners dwindle during spates of unbearable heat that make it too difficult to walk to the bus or train stop?

Once the indicator sets, or indices, are set and vetted, then what will drive the establishment of new sustainability indicators? Establishing sustainability indicators does not automatically ensure that they are benchmarked, targeted and actually pursued to expectations. In order for sustainability indicators to serve their full role, the executive level needs to be on-board and committed. Additionally, sustainability awareness and training needs to permeate the agency — laterally and not just top-down. The organization may also need additional experts on board to facilitate and guide the other departments work to align with the goals. Lastly, in regards to the afore-stated intrinsic influences,

government leaders base their priorities on constituent demands. In order for sustainability achievements to have resonance in the populace, the public needs to be educated and convince of their value to them personally and to society in order to be motivated to support it overtly.

Sustainability needs to gather both internal and external support in order for any set of indicators to have stick, or relevance, to the employees in an agency, and be monitored with rigor and intention. Sustainability indicators cannot be a hierarchical imposition but rather, one that engages lateral input from both within and outside of the agency. Extrinsic and intrinsic influences need to be in balance so that the needs of the community are in equilibrium with the needs of the organization and the politicians when developing indicators. Outreach is important in that it sussess out the needs of the diaspora in ways that articulate that represent their communities. Additionally, stakeholders have a chance to specify the needs of the ecosystem—from water, air, and soil quality to indigenous insect and animal life to native flora and fauna. There are ways to foster these concerns in a shared forum and such crossover of interests and solutions can be identified organically through open and healthy dialogue.

The very act of converging and engaging in outreach empowers all participants and creates awareness and resonance about sustainability issues and the value of measuring them. (It counts when it is measured.) The exercises on goals and tradeoffs help participants understand the “you can’t have it all” conditions that constrain any public works project. It also helps participants understand that sustainability issues are complicated and intertwined. For example, increasing walkability within a transit-oriented-community can mean reductions in parking spaces and road space for drivers. In contemplating tradeoffs, participants deepen their grasp of the rank and priority dynamics of indices of indicators.

In regards to influences intrinsic to the organization, there are positives and negatives to watch. The leadership may exert excessive influence on the establishment of the indicators. Sometimes, the preferences reinforce the status quo, which can be counter-effective to innovation and internal partnerships. Other times, the employees’ and departmental expectations of sustainability efforts create indicators that advocate strengthening the current structure of the organization, such as the silos and hermetic departmental approaches to working. Other times, intrinsic influences can be positive for the organization and for the enrichment of a robust discussion, and lead to the creation of a nuanced and customized set of indicators for the transit agency. This is especially the case in the context of a workforce that has received training and education on the dimensions of, the long-term value of and the urgency for sustainable practice.

Thus, we can begin to imagine the administratively and politically challenging balancing act between internal and external influences. It is exactly this tension that helps to forge a middle ground for all of these competing interests. Even if the outcome is not as radical and

forward-thinking as the sustainability planners might have hoped, it creates a baseline from which to advance, year after year, in similar step with the qualifications for the awards of the APTA Sustainability Commitment.

At the heart of sustainability is a massive and radical shift in how we as a culture evaluate “success” in our culture in the USA, and not just California or even Los Angeles. Sustainability calls for a new rubric of indicators for identifying success. Up until now, mainstream economics has dominated the discussion, which is based on infinite accretion of wealth through endless consumption, where the idea that more is more reigns supreme. It thrives on limitless and continuous growth, quantified as Gross Domestic Product, and yet it is completely unsustainable. It fails to recognize that wealth concentration in few pockets actually destabilizes society. It also fails to recognize and respect that resources of the world are finite. Mainstream economics is primarily interested in its organizational self, and externalities are either opportunities or threats. At this rate, society will only plunder, exhaust, deplete, and destroy its the natural context to which humans are only one small element, and thereby destroy ourselves. Such a deplorable finale to a species capable of extraordinary achievement is unfortunate to say the least. What’s worse is that the decline will be protracted, painful and grossly unjust, with those who are most vulnerable suffering the most. Whether globally or locally, the distribution of wealth is already becoming increasingly uneven. The middle class is steadily shrinking nationally and in Los Angeles.⁸ Los Angeles was rated the most congested urban center from among 1,360 cities in 38 countries.⁹ LA Metro has the opportunity to take a use sustainability indicators as a method of challenging these negative trends.

It is clear that standard mainstream economics is untenable. By contrast, ecological economics takes a more holistic position than mainstream economics and is concerned with both internal and external effects. The three interrelated goals of ecological economics are sustainable scale, fair distribution, and efficient allocation. Its motive is not endless consumption but rather, using conservatively only what resources are needed. It respects the limits of human intervention on the delicate balance that provides a flourishing system in which humans can also thrive. One analogy for understanding the rationale behind ecological economics is that every organism reaches an apex of growth, following which the goal transforms into maintaining homeostasis. The consumption-based criteria where bigger is better and more is more is unsustainable and only exacerbates gaps within society that create instability because the extra is not efficiently allocated across populations.

Ecological economics is focused on the Genuine Progress Indicator (GPI) as the metric of success or of need for improvement. GPI is an attempt to measure whether the environmental impact and social costs of business, production and consumption in a country are negative or positive factors in overall health and well-being. Unlike Gross Domestic Product, it factors in the cost of pollution in the creation of that product. GPI prices externalities omitted by mainstream economics (including pricing carbon, pricing

8. Geiger, Abigail. “Are You in the American Middle Class?” Pew Research Center, Pew Research Center, 6 Sept. 2018, www.pewresearch.org/fact-tank/2018/09/06/are-you-in-the-american-middle-class/.

9. INRIX. “Los Angeles Tops INRIX Global Congestion Ranking - INRIXINRIX.” INRIX - INRIX, inrix.com/press-releases/scorecard-2017/.

impacts on other natural resources and ecosystem services).

The transportation market, dominated by single-occupancy private vehicles, thrives on mainstream economics. It will unlikely shift to ecological economics on its own because such would be dis-advantageous to its profit-making agenda. Government and other organizations outside of for-profit business must create the space for such alternative economics and regulate companies whose operation and manufacturing compromise common assets such as water or air. It is up to government to do this.

A bustling and well-used transportation system and agency would actually be a powerful force in driving ecological economics and could succeed through the establishment and adoption of its sustainability indicator indices. By its very nature, mass transit allocates space equally and makes itself available to all with the payment of affordable fare. Sustainability indicators provide a promising framework for re-evaluating what successful transportation is, outside of just ridership numbers and revenue — though these are important too. On so many levels, mass transit can excel past automobile transportation as the superior mode: resource efficiency, waste and pollution reduction, community building, affordability, and improvement to physical health, to name a few. Sustainability indicators would capture and quantify these wins.

Another challenge is the psychological seduction of personal ownership in the American psyche (as opposed to shared resources, where utility replaces ownership as the allure). This phenomenon manifests with your car (an expensive foreign vehicle, perhaps) or where you live (a large house in an exclusive neighborhood, perhaps) or where you go on the weekends to eat out. To this end, sustainability must contend with mass media marketing, advertisement, cultural values, and social psychology of what is prestigious, desirable, and enviable. The minimal and frugal touch that decreases one's carbon footprint and promotes long-run social well-being has until recently often been seen as “not cool” at best and disdainful at worst. A wholesale shift in how we regard success in life and consumption needs to happen but the messaging cannot simply be an intellectual one.

Preaching about sustainability and imposing indicators by themselves are not enough. Agencies need leadership to inspire change from the internal culture and develop smart campaigns that begin to shift the public perspective on what is truly beneficial to the individual and to society. This will be difficult because capitalism is about fierce competition and individual gain, while sustainability actually advocates societal betterment for everyone and everything.

Because transportation is relevant issue for all who participate in society, LA Metro's responsibility aligns with the values of sustainability. Given the diverse themes that sustainable practice touches (i.e. GHG reduction, access to employment centers, equitable access), sustainability metrics could help Metro apply for additional state and federal funding, some of which would need to go to public education and awareness so that we create a cycle sustainable supply and demand.

Riding transit becomes a political statement about the kind of future you want to enjoy and eventually leave behind for future generations.

With properly developed, refined, vetted, and adopted sustainability indicators, Metro can confidently step forward with bold goals and service improvements, and invite supporters to join proudly on this journey. Because what gets measured gets done, LA Metro would do well to be on track with the sustainability indicators and goals for refinement. It should recruit a cross-section of its workforce to be part of the necessary cultural shift. It will take management and leadership. As much work and struggle as this may entail, it will lead LA Metro to evolve from outdated mainstream economics and set an example to the rest of the country about public transportation circulates the lifeblood of an urban community. There's not much time left to make this change if we do want a livable future for ourselves and for our descendants.

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