Living Streets Executive Summary

Our streets are arterials that touch and connect every neighborhood in Los Angeles. They span the length of the city and are utilized by everyone. Because of this there are arguably no other infrastructure projects that can have a greater impact on the health and environment of an urban area like L.A. For most of the city's history our streets have been built largely with the sole purpose of servicing the automobile. "By 1925, Southern California had a density of 1 car per 1.6 people [which] the rest of the nation would not reach until 1950." (Davis, 1990) In 2000, this ratio was approximately the same, 1 car per 1.85 people. With close to 4 million people living in the City of Los Angeles, building or maintaining infrastrmking liucture the way we did in 1950's is no longer feasible. It's time for a new perspective. We must start building the infrastructure of 2050, which is multi-purposeful, functional, and beneficial to all Angelenos. Beyond multi-modal, any new transit that requires streets should be carried out on ***Living Streets.***

Modern and post-modern municipal planning strategies have been automobile-centric. In the City of Los Angeles, for example, 28% (86.5 square miles) of the 468.7 square miles of land area is occupied by streets, with another 800 miles of alleys and 181 miles of freeways (City of Los Angeles Mobility Plan 2035). These figures do not include the amount of land area devoted to idle cars, like parking lots, garages, or driveways. The hard infrastructure of streets and parking lots exacerbates issues such as flooding, increased street temperatures, and elevated exhaust emissions (carbon, pm, NOx and Sox).

The lack of green infrastructure makes the City's 4 million residents highly vulnerable to the effects of heat impacts. Asphalt streets, parking lots and playgrounds, with their dark, heat-absorbing materials, add upwards of 1.8-5.4 °F (1-3 °C) to the surrounding environment, warming nearby homes, schools and office buildings (Oke, 1997).

In addition to heat impacts, municipal streets and sidewalks act as a conveyance mechanism for carrying water runoff into streams, creeks, rivers, and oceans. It is estimated that every time it rains an inch in the City of LA, 3.8 billion gallons of runoff pollute our waterways and ocean (City of Los Angeles Integrated Resource Plan for Water). This runoff is often contaminated with pollutants such as metals, pathogens, toxins, nutrients, and trash. The impacts can be a missed opportunity to enhance our local water supply, unsafe beach water quality, contaminated fish, and impaired ecosystems.

The current "Business as Usual" (BAU) models for street and sidewalk maintenance --the simple re-paving / re-sealing a street, and the outright reconstruction of the street and sidewalk -- fail to address, if not worsen, a litany of issues confronting cities including: the lack of groundwater infiltration or recharge, large heat islands, and poor air quality. Poorly designed streets and sidewalks can be aesthetically disempowering and socially destructive for generating health capital, economic development, and public engagement.

Across the nation, city planning is adopting new strategies to address climate change. Cities must adapt and become more resilient in order to thrive in the face of climate change. Cities must promote public right-of-ways and spaces that generate multiple social benefits with environmental services built into them. Adaptation provides an opportunity to rethink the role of city streets and sidewalks. To this end, cities have recently investigated different street paradigms such as *Complete, Green, and Cool Streets* to capture rainwater, promote pedestrian usage, or reduce city temperatures.

This report proposes a more inclusive street paradigm, *Living Streets*, as an all-encompassing method to street and sidewalk construction for the City of Los Angeles. Living Streets combines all three alternative street strategies—complete, green, and Cool Streets -- under the banner of *Living Streets*.

Living Streets are more equitable. They allow different populations to fairly use and share public resources. Living Streets are walkable, bikeable streets that:

- improve air quality by using vegetation to facilitate the removal of air pollutants and GHGs.
- improve water quality and quantity by capturing, storing, and cleaning stormwater, helping to retain valuable water resources in drought stricken areas and prevent flooding and soil erosion.
- improve human health and general wellbeing by lowering air temperatures, making streets cooler, cleaner, safer, walkable, and aesthetically pleasing.

This results in decreased medical expenses and increased livability. Living Streets develop clean and safe open spaces and recreation. They provide a public greenway that can provide active and passive recreational opportunities for the surrounding neighborhoods.

This report details the costs and benefits associated with investing in Green, Cool, and Complete Streets in the City of Los Angeles compared to two "business as usual" or traditional approaches. It also investigates and discusses the enhanced or increased benefits of incorporating all three design elements into one Living Street.

According to this study, the Living Street paradigm generates the highest total benefits and the highest net present value of all street approaches. In Table 1, all four non-traditional approaches (Green, Cool, Complete, and Living) are compared to a simple re-paving of the existing subgrade street infrastructure — called "BAU1-only". In this analysis, the Living Street (Living-BAU1) produces an additional $5.35 billion in total benefits to society when compared to BAU1-only approach and more than $3.04 billion to the next highest non-traditional street design (Complete-BAU1). In addition, Living Streets (Living-BAU1) produces $2.78 billion more in net present value over the lifetime of the project as compared to BAU1.

This analysis is meant to provide a high-level economic comparison of different street paradigms that could be implemented in the City of Los Angeles. The scenarios have been created using several assumptions to design 1,000 center-line miles of road for each scenario. The analysis uses averages for Los Angeles' road, weather, and population conditions. In addition, the analysis uses a discount rate of 4% as instructed by the Caltrans for Life-Cycle Cost Analysis of pavement structures (State of California,

Department of Transportation, Pavement Standards Team & Division of Design, 2010). Finally, the results are presented in 2015 US Dollars.

The results, therefore, are meant to give a comparison of the costs and benefits associated with these elements. They are not meant to provide an estimate to the actual costs and benefits of a particular project implemented within the city.