Private Motorized Transport, Los Angeles, USA

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Introduction

Los Angeles (LA) became a city synonymous with the automobile during the course of the twentieth century. Nowhere conjures images of endless concrete corridors more so than the 'city of Angels'. Banham spoke of LA's freeway system as a 'single comprehensible place, a coherent state of mind, a complete way of life' (1971).

This case study examines the city's affinity with the car, how it came about, and the issues that the city faces as a consequence of its congested, auto-dominated infrastructure and development choices of the past. The key issues examined are sprawl and the unabated land take for roads in the city, smog and air pollution and the associated health effects that they create, and access to mobility.

Background

Highways constitute 60 per cent of Los Angeles' land area (Whitelegg and Haq, 2003) and around 70 per cent of the surface of Los Angeles is devoted to the car in some way, be it roads, driveways, parking lots or petrol stations (Elsom, 1996). Its geographic location – in that it is bounded by mountains to the east and the ocean to the west –causes the air to 'stagnate' and smog episodes to be frequent. This also means that sprawl is topographically contained but stretches north-south. Sperling and Gordon (2009) cite rapid growth, proliferating car use and sprawling suburbanization as the main issues associated with LA's air pollution problems.

Two oft-cited misconceptions about the city make Los Angeles a fascinating case study. The first is that the city was built around the automobile and that the freeway system in place was responsible for shaping the city – the freeways were not formative, but in fact came some decades after the formation of the city, as will be examined. The second is that Los Angeles is an example of a very low density conurbation, and the epitome of twentieth century sprawl. Whilst it is indeed sprawling, it is surprisingly dense in comparison to other US and world counterparts. So as well as dispelling these common notions and explaining the reality of the city-region, this case study will provide a concise overview of the history and development of Los Angeles; examine the key issues associated with the city's unabated motorization, and its plans for the future in terms of addressing mobility, health and sustainability considerations to evolve into a liveable metropolis for the twenty-first century.

Los Angeles is the second most populous city in the United States and the most populous city in California and the western United States, with a population of 3.83 million (2009) within its administrative limits on a land area of 498.3 square miles (1,290.6 km^2). The surrounding urban area of Los Angeles – referred to by the US Census Bureau as the *Los Angeles-Long Beach-Santa Ana* area, beyond the city boundaries captures a population of more than 14.8 million (2009), making it the 14th largest urban area in the world, and one of an increasing number of global megacities (Figure 1).

Both the city and the greater metropolitan area are characterized by an extensive network of freeways.

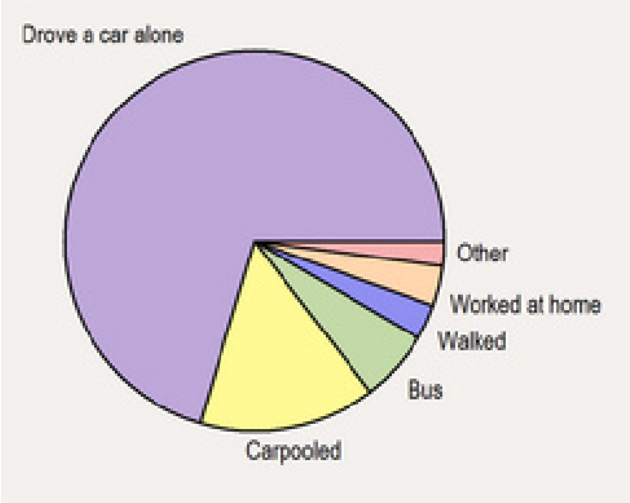
Figure 1: Los Angeles city limits and surrounding areas

Source: Musser, 2009.

There are 915 freeway and highway miles in Los Angeles County (Caltrans, undated (b)). Given the scale on which both the road and public transportation (referred to here as transit) infrastructure has been developed and needs to be managed, it can be challenging to determine where the city jurisdiction ends and the county begins. Los Angeles county Metropolitan Transportation Authority (Metro) – also known as MTA or LACMTA is the California state-chartered regional transportation planning agency (RTPA) and public transportation operating agency for the county of Los Angeles. The agency is responsible for the development and oversight of transportation plans, policies, funding programs, and both short-term and long-range solutions that address the county's increasing mobility, accessibility and environmental needs. The agency is the primary transit provider for Los Angeles, although the Los Angeles [city] Department of Transportation (LADOT) does operate some of its own transit services as well. Caltrans – California's Department of Transportation is responsible for planning, design, construction, maintenance and operation of the state highway system (Caltrans, undated (b)). For ease, unless referring specifically to the city limits, this case study will reflect on the 'Urbanized Area' of *Los Angeles-Long Beach-Santa Ana* (the region) and relate to the work of Metro.

Los Angeles is one of the most car-dependent cities in the world. It is a city, second only to San Francisco in the US, in terms of vehicles per square mile (2,161) (Newton, 2010) and in which transit only accounts for 2 per cent of total trips across modes (Eidlin, 2010), demonstrating the complete dominance of the private car. In 2006, 72 per cent of LA's working population travelled to work in single occupancy vehicles, with a further 11.9 per cent in high occupancy vehicles (HOV). Only 7.0 per cent of commuters used public transportation (Figure 2). The majority of public transit users (65per cent) were non-white and 3 quarters of them earned less than $25,000 (US mean average is over $43,000) (US Census Bureau, 2006), which highlights some of the social disparities in the city and illustrates serious distributional inequalities in terms of access to cars. Overall LA is not geared towards non-motorized mobility – 3.4per cent of Los Angeles residents commute to work by walking

Figure 2: Mode of transportation to work in Los Angeles County



Source: City Data, undated.

and cycling accounted for less than one percent (0.6 per cent) of all work commutes as of 2006 (Figure 2).The remainder of the working population is home-based. In order to unpick the issues LA faces and to better understand the intricacies of Los Angeles' transport infrastructure, it is useful to first examine the history and development of the network.

Private vehicle use in Los Angeles – Context

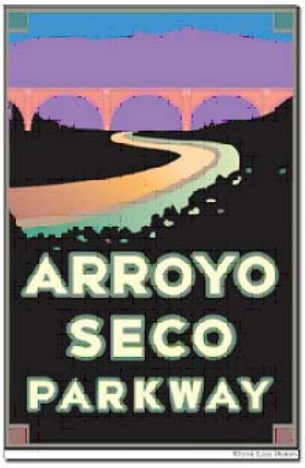
Context 1: Streetcars, rail tracks and the demise of early transit – It is commonly assumed that Los Angeles grew around the freeways as they were being built, as many US cities did after World War 2. However, the city was a thriving center of activity well before the emergence of private motorized transportation and it was in fact the interregional rail system and the city's water distribution system that made development possible throughout the region (Giuliano, 1996).The city grew around and alongside the rail tracks and streetcar corridors between the late 1800s and the boom of 1919–1923 (Keil, 1998).Today's freeways even take routes that were established by the 5 original railroads. At its height in the early 1920s, the streetcar system extended over 1600 miles linking up the widespread LA basin (Kunstler, 1993) with 6,000 streetcars each day serving 115 routes (Gottlieb, 2007). The vast scale of modern day Los Angeles can better be appreciated when it is realized that between 1913 and 1928, the city grew fourfold (Gottlieb et al, 2005).

So whilst the car cannot be held responsible for the development of the city, which was well underway prior to its arrival, it was however accountable for the demise of the established and

Photo 2:Traffic Los Angeles

Source: Google Images, undated.

Photo 3: Arroyo Seco Parkway



Source: Caltrans, undated a.

well-utilized rail and streetcar networks that preceded it. As early as 1920, with the introduction of Ford's Model T, the car began to compete with the established public transportation systems in LA and elsewhere, vying with the streetcars for access and posing hazards for pedestrians and cyclists (Gottlieb, 2007). Streetcar services became disrupted and as residential and industrial development continued to grow outwards, cars simply became easier, as travel distances increased. Between 1919 and 1929, when the population of LA nearly doubled, car registrations increased 550per cent (Kunstler, 1993) and by the end of the 1920s 1 in 3 Angelenos owned a car (Keil, 1998).

As a result of the staggering rise in car use, downtown LA actually became less of an industrial hub as business moved away from the CBD to outskirts where space for parking was easier to come by (Keil, 1998).Soon after, the newly powerful car industry set about removing of the public transit infrastructure, leaving not just Angelenos, but many transit users across the country with little alternative but to buy a car. This move was progressed throughout the 1930s–1940s, as this excerpt from Nadis and McKenzie (1993) explains in detail:

> *'Starting in the 1930s, National City Lines, a company backed by General Motors, Standard Oil, Phillips Petroleum, Firestone Tire and Rubber, Mack Truck and other auto interests, systematically bought up and closed down more than 100 electric trolley lines in forty-five cities across the country. In 1949, a federal grand jury convicted GM and the other companies of conspiring to replace electric transportation systems with buses and to monopolize the sale of buses'.*

Whilst support was initially provided for buses as alternative to utilize the city's new roads, even these were gradually pulled throughout this time as the auto-centric 'monoculture' (Sperling and Gordon, 2009) took hold (Photo 2). The deliberate promotion of the automobile as central to the Southern Californian lifestyle allowed it to become culturally embedded (Gottlieb, 2007).

Context 2: The Arroyo Seco Parkway and the expansion of highways – But perhaps it was the development of the Arroyo Seco Parkway in the late 1930s and early 1940s which dealt a fatal blow to Los Angeles' mass transit. It was initially marked as a revolution in travel which could bring modes together in a single infrastructure, yet it became a major car-centric

development and marked the watershed of mass construction and expansion of California's freeway system (Photo 3). Indeed, the Parkway was originally designed to be part of a multi-modal transportation system available to all users; a road which would blend into a landscape of open areas and green space (Gottlieb et al, 2005), but the future dominance of the car over the city's infrastructure was beginning to take shape. Indeed, even before the end of the construction, the central concept shifted towards a system to allow for high speed commuting, which dismissed the initial objective of delivering a linked transportation system. It was the first '*grade separated, limited access, high-speed divided road'* in the Western US. It became the initial stretch of road for what would become the world-renowned 4,000 miles of California's metropolitan area freeway system and became the prototype for urban freeways across the country, and eventually across the world (Caltrans, undated a).

Although the network was established to enable cars to travel long distances and was designed to minimize disruption to the flow of traffic. What the freeway system ultimately delivered to Los Angeles during the 1950s was divided neighbourhoods, reconfigured cities, and suburban sprawl (Gottlieb et al, 2005). In fact, even as the intricate road network was being completed, the impacts of the investment were becoming apparent and ever since the mass investment in the freeway city was realized, LA has been trying to redress the balance

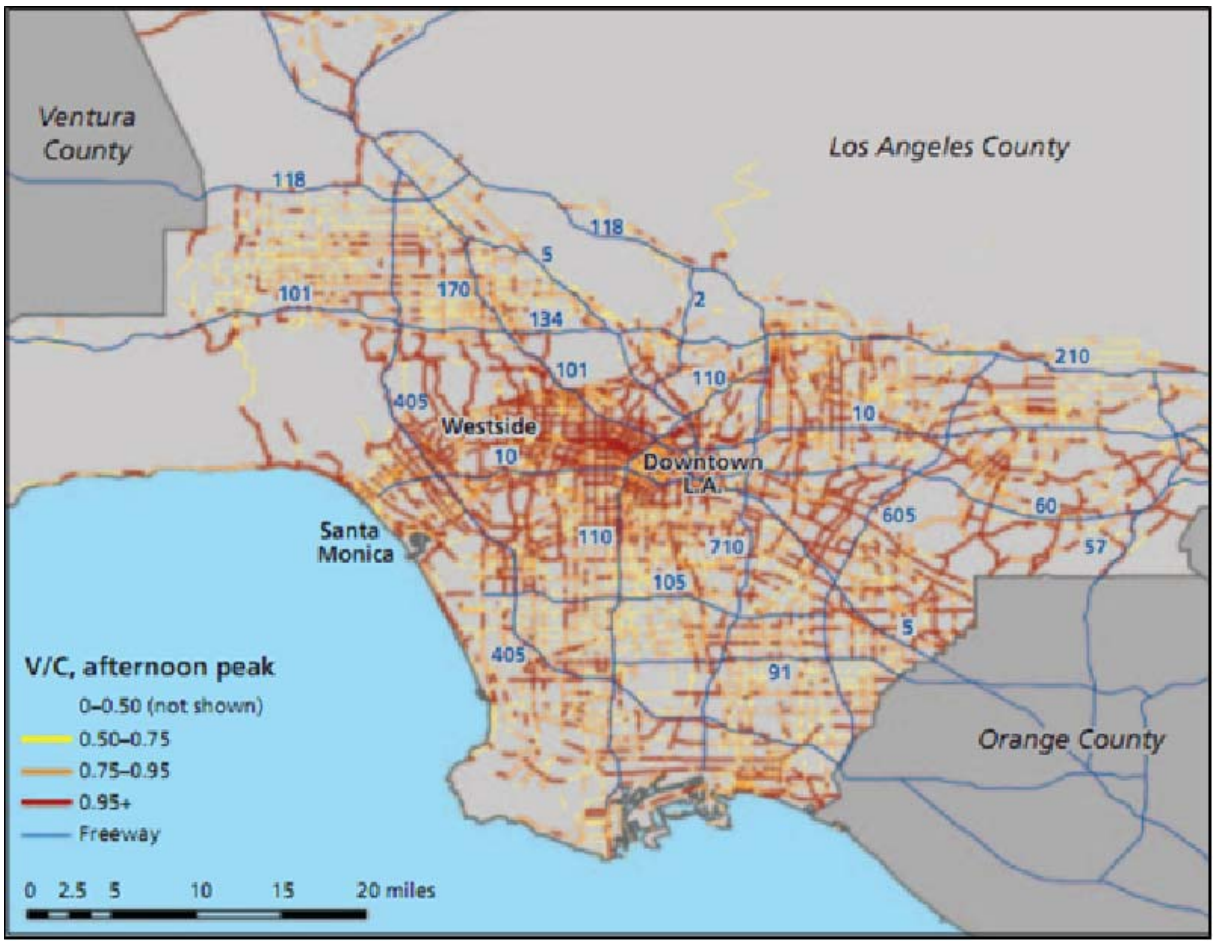
Photo 4: Freeway interchange Los Angeles

Source: Bertrand, undated.

between living within the system it created and addressing the issues it caused (Photo 4).

Context 3: Congestion on Los Angeles' roads – In the 2010 Urban Mobility Report, LA ranked the most congested 'very large' area in the US (Texas Transportation Institute, 2010), in terms of travel delay and excess fuel consumed (over 400 million gallons) through travel in congested conditions. The average traveller in Los Angeles experienced 63 hours of traffic delay per year according to the study and these delays cost the region almost $12 million. This is down from 72 hours per commuter from the previous year's report – an improvement – but the city still topped the table in terms of delays in peak period proportional to free-flowing traffic conditions (Texas Transportation Institute, 2010). It is a complex network, with some expressway segments congested for several hours a day and this peak period can be up to 12 hours per day on some portions (Giuliano, 1996) (Figure 3). However, at the same

Figure 3: Modelled Arterial Volume-to Capacity Estimates for the Afternoon Peak 2004



Source: 2004 regional transportation-model-data provided by Southern California Association of Governments. Taken from Sorensen et al, 2008.

time there also is considerable redundancy in the freeway system (Richardson and Gordon, 2004).

The congestion highlighted in the Urban Mobility Report could easily be attributed to excessive car use and little transit provision, yet LA's complex land use, regional distribution and parking provision are also likely significant contributors to the problems (Sorensen et al, 2008). Indeed examining how the city has developed and the scale at which it operates, lends much support to understanding some of these complex congestion problems as both these problems and those related to smog (see Issue 4: Smog). The congestion and smog that Angelenos experience have much to do with decades of relentless expansion. Los Angeles is often referenced as the antithesis of sustainable growth; as the '*symbol to many of how urbanization should not take place'*, representing all that is wrong with contemporary development (Reilly, 1993). And it is true that Los Angeles presents some fairly unique circumstances and challenges.

Issue 1: Sprawl

Los Angeles is undisputedly a large far-flung city with no real centre and lots of smaller areas (Gottlieb et al, 2005); it could be seen as one big suburb. Whilst it does indeed sprawl, it is surprisingly dense. In fact, Los Angeles has been the densest urbanized area in the United

States since the 1980s, denser even than New York and San Francisco (Eidlin, 2010). Although the center of the city is actually fairly low density (with some 81per cent of the available land space being used for parking – more than any other downtown in the world

Table 1. City vs urbanized area densities – Los – Angeles and New York

	City Level			Urbanized Area Level		
Location	Area (mi_)	Population	Density	Area (mi_)	Population	Density
Los Angeles	472	3,694,820	7,828	1,682	11,789,487	7,009
New York	304	8,008,278	26,343	3,397	17,799,861	5,239

Source: O'Flaherty et al, 2006 – data from 2000 US Census.

(Gottlieb, 2007); unlike Manhattan, LA's suburbs make up for this, so in terms of overall 'distributional density' (Eidlin, 2010)LA comes out on top – Table 1.

Although the region suffers many of the problems that accompany high population density – extreme traffic congestion and poor air quality, it doesn't benefit from attributes normally associated with densely populated areas, including fast and effective public transit and a core area (Eidlin, 2010).Indeed, many of the trends expected of high density cities do not apply to LA – it is something of an anomaly. For instance, though Los Angeles has by far the densest road network among the 14 largest metropolitan areas in the United States, in terms of arterial/highway road lane miles per square mile (Sorensen, 2009) it still ranks second in terms of total vehicle miles travelled (VMT) per total lane-miles. Although you would expect people living in dense urban areas to drive less, Angelenos do not seem to curtail their driving as expected in response to higher density (Sorensen et al, 2008).

This irregularity may be because the unique settlement patterns in the city trigger unusual driver behavior and travel patterns. Indeed Los Angeles is distinct from other cities as people travel in all directions, there are many centres, not just one and the vast majority of people don't use transit (Metro, 2001), so travel is likely to vary from conventional hub-spoke examples of urban planning seen elsewhere. This represents huge challenges in trying to plan

Figure 4: Population growth v highway speed

Highway speed projections are average daily speeds. Peek hour conditions will be slower.

Source: Metro, 2001.

for the future. And with the population expected to increase to some 13 million by 2025, problems in terms of congestion on the roads are only projected to increase (Figure 4).

The scale of the city is problematic – the distances that need to be covered, not just from suburbia to CBD (indicatively West Los Angeles to Downtown is about 14 miles), but from neighborhood to adjacent neighborhood are too far to walk or cycle, with walking and cycling infrastructure frequently missing. For example, although Bel Air and Brentwood are just over 3 miles apart, both ranked in the bottom 10 neighborhoods in Los Angeles by WalkScore[1] and are considered as car dependent (WalkScore, undated). Furthermore, ensuring bus routes connect all outlying areas to each other would be hugely expensive and unlikely to be comprehensive. Building out is not a viable option, as there is nowhere left to build and redevelopment on such a massive scale is prohibitively expensive. In short, LA is stuck with its roads, and must look for ways to work with or in spite of them.

LA response: Sprawl

Los Angeles has acknowledged the need for things to be different in the future and over the last decade has set about '*infilling*' to promote density as a response to addressing sprawl – not just to redress the balance, but also to account for the increase in population. In terms of 'smart growth' LA actually has a lot to teach about how infill can be achieved and how to maximize development potential in a location where further peripheral expansion is not possible.

Instead of further road building (although this is still taking place in the region) and new suburban development, land use management is emerging as a new response to deal with some of the fundamental problems LA and other cities are facing. This is a fairly significant change in mindset, one which previously would have been considered 'a kiss of death for any politician' (Doyle, 2000).

Reducing VMT through better land use planning is an idea that is being pioneered in California. California Senate Bill 375 (SB 375) was passed in 2007, and is designed to make mobility different, to encourage people to use other modes of transport for shorter journeys and to generally drive less. Whilst the specific measures to be implemented remain unclear, the bill ultimately aims to reshape how neighbourhoods look and provide alternatives to the car through land use planning, urban transit provision and high density development (Anderton, 2010), which is the first such attempt to make the link between GHG emissions, transportation funding and land use. Transportation funds in California are now being allocated based on demonstrable efforts to promote transit-oriented development (TOD) and 'smart growth', so Los Angeles is now mandated to take its efforts in infill development further.

Yet the region should be mindful of the mistakes of the past. Whilst there is plenty of potential for infill development across the region (Cuff, 2007), in moving towards a city of more 'compact pockets' steps should be taken to ensure that social equality is improved, or restored, that access to transportation for all is ensured, (which will be addressed under Access – Issue 2) and that this infill is improving quality of life, rather than making poverty and inequality worse.

1. Walkscore.com is a walkability index of US cities ranking areas based on how many facilities are within walking distance within a given area and whether they can be accessed on foot.

Issue 2: Access

It is indisputable that some of the infrastructure decisions made in LA over the past century created or exacerbated social and in many cases racial inequality. Suburban growth in LA and across the US was actively promoted from the mid-1940s to the mid-1960s, when the federal government funded several thousand home sales, a policy which provided both an employment program for construction industry and housing to the middle class. Yet these housing policies also promoted segregation since nearly all early suburbs were restricted to white residents only (Cuff, 2007).

These early developments stimulated extreme inequity in terms of access to transportation infrastructure, at a time when a once 'transit-rich' area, was becoming extremely 'transit-poor' leaving those people without access to a car, who were reliant on transit as a sole means of transportation, extremely marginalized (Gottlieb, 2007).

It was several decades before the need for improved transit and better provision for these communities was realized, and it wasn't until the 1980s that the trend towards the county spending more on transit provision than it did on highway building began (Photo 5 above).

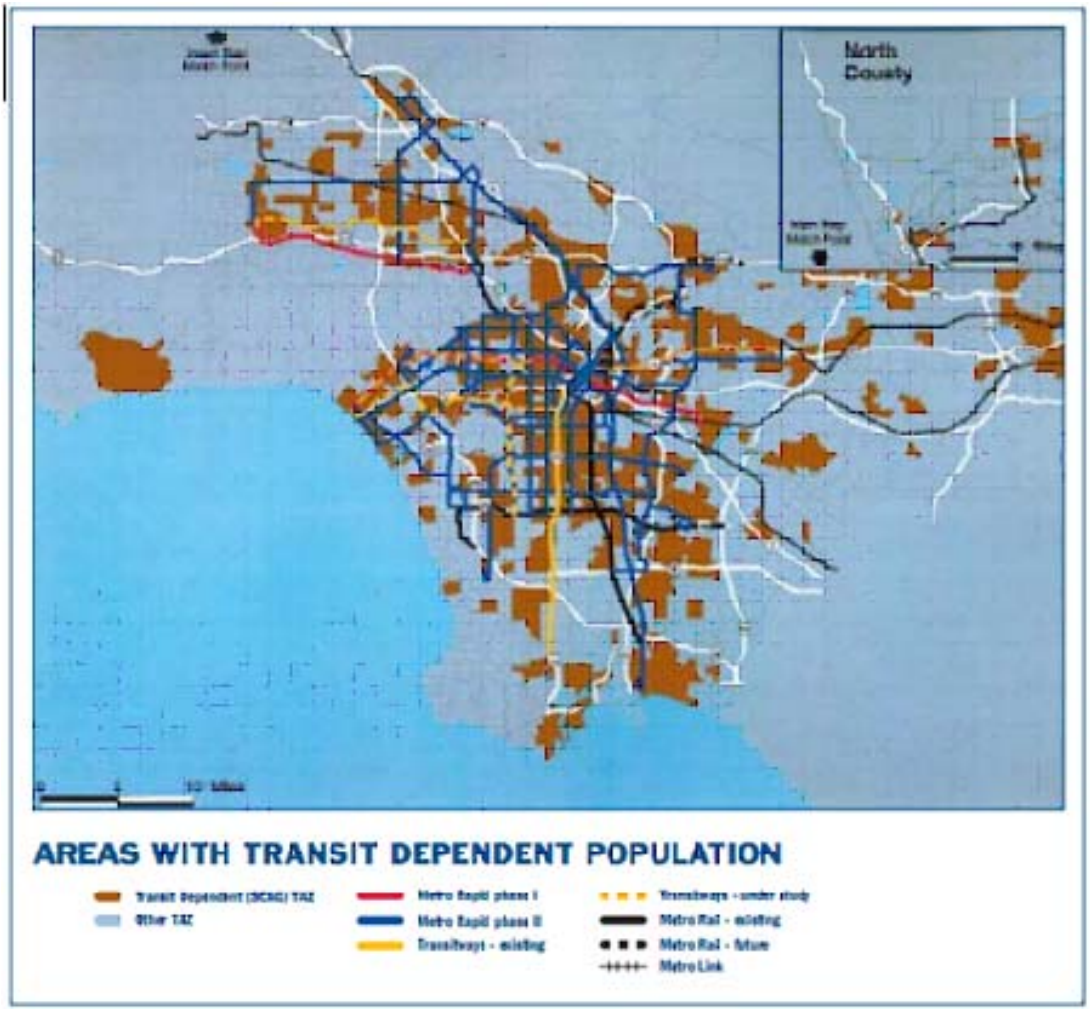
The development of the Metrolink (the commuter rail system that links Orange County with surrounding areas including Los Angeles, Riverside, and San Bernardino Counties) was a step forward. However, previous transit revenue for buses was reinvested in the commuter-oriented rail system, which therefore diverted attention towards linking the suburbs housing middle- to upper-middle-income travellers to the centre (just as the freeways had done), leaving the older metropolitan areas relatively un-served as integral bus services declined. This again resulted in those dependent on the buses and those without a car further marginalized (Gottlieb et al, 2005), as can be seen in Figure 5, which illustrates the transit dependent population by area.

The disparities are not just socio-economic, but also clearly there are ethnic and cultural considerations too. Figure 6 illustrates the demography of Los Angeles Metropolitan area in 2009, where over half the LA population is white. In 2006, 65 per cent of commuters on

Photo 5: Los Angeles Metro

Source: Henry, 2006.

Figure 5: Transit dependency



Source: Southern California Association of Governments; Taken from Metro, 2001

public transit in Los Angeles were non-white, and 70.2 per cent of these were Hispanic and 67.6 per cent were foreign born (US Census Bureau, 2006). There are therefore clear inequalities of access which need to be addressed in the city.

LA response: Access

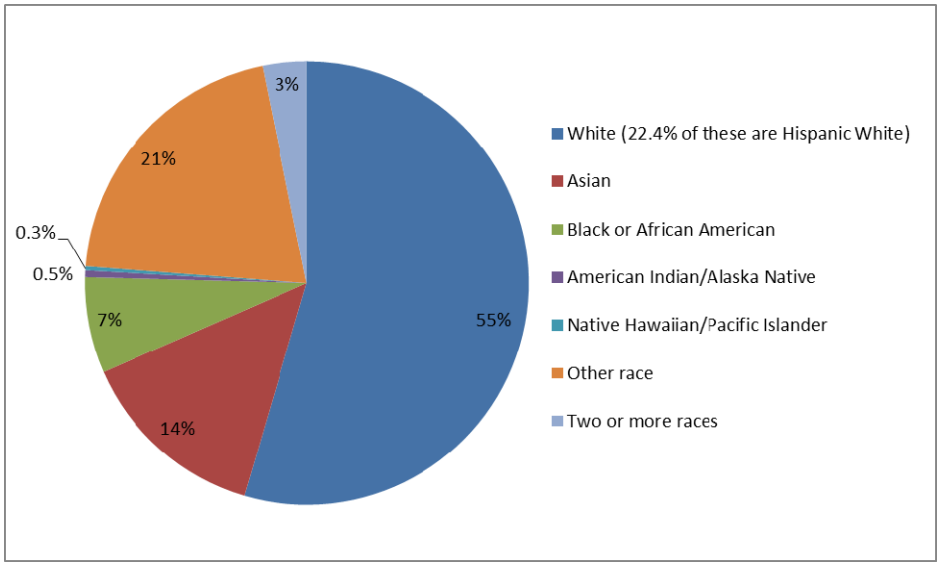
With the expected increase in population towards some 13 million people in 2025, the existing inequalities need to be better addressed and steps taken to ensure that access to transportation for all is prioritized and delivered. And over the past decade, LA has indicated that it is becoming more committed to a sustainable, more transit-focused future. In 2001, the county's Long Range Transportation Plan, placed a strong emphasis on public transit, outlined plans to expand the region's Metro Rapid Bus program, and promoted ridesharing, walking and bike riding (Metro, 2001). Somewhat contradictorily, it also outlined plans for increased highway capacity – though emphasis here was placed on the development of HOV lanes (Metro, 2001).

This plan was updated in 2009, and further committed to:

- Expanding the Metro fixed guideway/busway network to over 177 stations covering nearly 230 miles
- Expanding the Metro Rapid Bus network to provide over 400 miles of service through 35 cities and the county of Los Angeles

- Operating and expanding the Metrolink commuter rail system
- Adding 170 carpool lane-miles along the carpool lane network
- Funding arterial, signal synchronization, transportation demand management, bikeway, pedestrian, transit capital and transportation enhancements

Figure 5: Los Angeles demography by race (2009)



Source: American Community Survey, U.S. Census Bureau, 2009.

- Promoting rideshare and other Transportation Demand Management strategies that provide options to driving alone (Metro, 2009).

Transit will remain inferior in usage compared to the car, with even the most ambitious scenario in the plan growing transit trips to only 15per cent of total trips made (Metro, 2001). However, this investment plan and certain other developments, including Measure R (see below), suggest that there is political commitment and public will behind Los Angeles' effort to redress the balance between cars and transit provision and non-motorized transportation.

Measure R is a half-cent sales tax for Los Angeles county to finance new transportation projects and programs, and accelerate initiatives in the pipeline–both transit and highway improvements. Los Angeles county voted it in by a two-thirds majority in November 2008 and it became law in January 2009, with the tax taking effect from July 2009 (Metro, undated (b)). From the revenue generated by Measure R, Los Angeles Mayor Antonio Villaraigosa advocated that '*Los Angeles 30/10*', an initiative designed to deliver 12 of the large-scale projects from the Long Range Transportation Plan in just 10 years, as opposed to the 30-year time scale suggested in the plan. In April 2010, the Metro vote to support the initiative was unanimous. Los Angeles 30/10 (Figure 7) is a visionary approach to transportation funding and development which is attracting attention to Los Angeles as a future pioneer of large-scale transit investment. The following additional benefits of the initiative are also stated by Metro:

- 160,000 new jobs will be created.
- 77 million more transit boardings.
- 10.3 million fewer gallons of gasoline used.
- 191 million fewer vehicle miles travelled (Metro, undated a).

Figure 7: Los Angeles 30/10 transport funding

Source: Metro, undated (a)

Issue 3: Smog

Starting in the 1940s a 'pall of haze' was reported over the city (Doyle, 2000) and by 1945 air pollution in Los Angeles was a problem serious enough to warrant public authority involvement, with factories prohibited from emitting 'dark smoke' (Mazmanian, 2009).

For some time, the automobile industry escaped focus as a potential cause of the 'smog' as increasingly stringent air quality standards that were being introduced in California to address these episodes. However, in 1950 Dr. Arie J. Haagen-Smit posited that this smog in the Los Angeles basin was actually produced in a photochemical reaction of pollutants – coming from both oil refineries and automobiles (Doyle, 2000). The sun was literally cooking the pollutants into a soup – a thick haze hanging over the city and surrounding areas.

The health impacts of the smog include stinging eyes, burning throats and lungs and tightness in the chest are now better understood, as are the longer term effects of smog – indeed children raised in the city have on average 10–15 per cent reduction in lung function compared with children growing up elsewhere (Elsom, 1996).

LA's response: Smog

As the cause and impact of smog became accepted in the state, air quality standards were developed and implemented to deal with the problems. In 1959 the state enacted legislation

requiring the Department of Public Health to establish air quality standards and controls for vehicle emissions (CARB, undated).[2] However, the problems continued. In 1965, LA endured an ozone concentration of 0.58 parts per million – almost 5 times higher than the standard that would be adopted in 1971. In the summer of 1971, Los Angeles and Orange County experienced 17 consecutive smog alert days (Environment California, 2010).

In order to deliver on these air quality standards, measures to reduce the air pollution from cars have involved a combination of regulation-enforced technological and fuel-based improvements. In 1959, the state legislature created the California Motor Vehicle Pollution Control Board, and gave it authority to test emissions and certify emission control devices. Initially in the 1950s and 1960s, retrofit crankcase devices were installed, but with the passage of the first tailpipe emissions standards in the late 1960s, these were replaced by the catalytic converter in the 1970s, which has since been described as the most significant pollution control device (AQMD, 1997). Since this time, catalytic converters have become standard on all vehicles.

Developments with regard to fuels also started to develop in the 1970s; with an initial measure to reduce the amount of photo-chemically reactive olefins in gasoline. Lead removal from fuel was the next significant step, which was initiated in the 1970s and fuel companies have been regulated for nearly 30 years to develop and sell cleaner gasoline. Since the 1980s, the search for alternative fuels has since been the primary focus (AQMD, 1997) and remains so – especially with the impetus added through the necessity to decarbonize the transportation sector. Indeed, whilst the GHG emissions associated with climate change are not responsible for the same problems as the emissions associated with local air pollution, the joint drivers together in searching for an alternative fuel source for cars, is compelling.

Figure 8 illustrates the severity of the problem in the area over the past 4 decades. There has been improvement in smog conditions during this period, but averages still remain above 'standard' levels. It was only in 1999 that monitoring began to pass without a 'stage 1 episode'[3] (Gottlieb et al, 2005). Los Angeles still suffers poorer air quality than other US cities, as well as 'extreme non-attainment' of standards (Mazmanian, 2009), but it is much improved.

Conclusion:

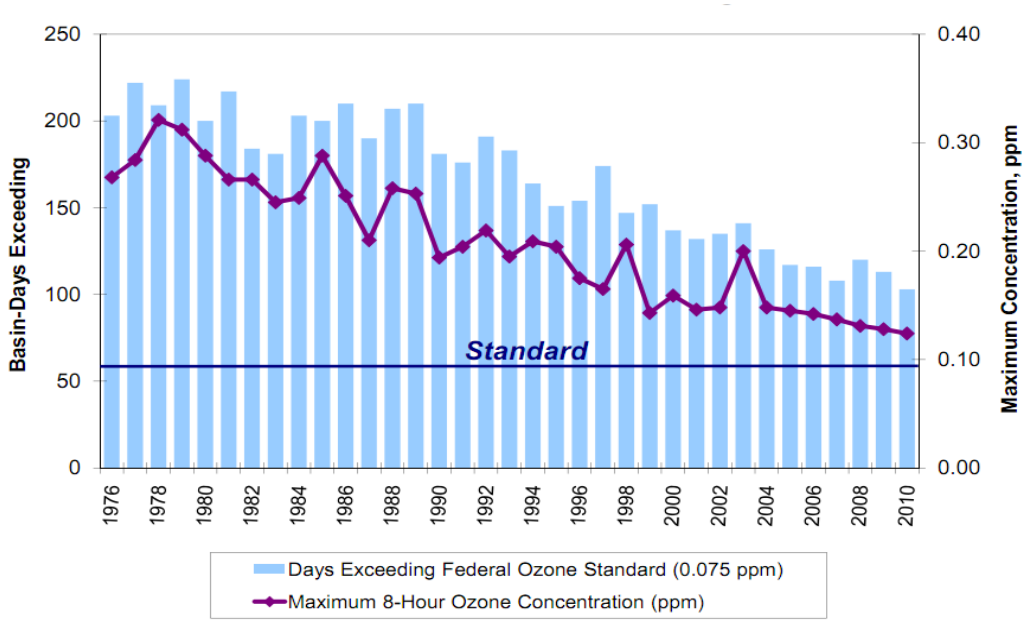
Over the past 100 years, LA has grown into a wide-reaching, multi-centered, surprisingly dense, yet disparate megacity. Its love affair with the car has endured, and despite the many negative social and environmental impacts that can be directly attributed to an auto-dominated infrastructure, Angelenos continue to travel more, further and alone. There is much evidence to demonstrate things are improving. Smog levels, whilst still high, are being managed. Development, whilst it continues, is more focused on metropolitan density and less on suburban expansion. Transit provision is increasing; most importantly in those areas and for those people who need it most.

However, the city still appears to shy away from non-motorized transportation. Granted it has a far from optimal structure and will never be a 'walkable city' because of its scale. But the opportunities to promote cycling and walking – especially in light of the increasing health benefits which could be derived from active travel and the risks associated with the American

2. The first statewide air quality standards were set by the Department of Public Health for total suspended particulates, photochemical oxidants, sulfur dioxide, nitrogen dioxide, and carbon monoxide.

3. Stage 1 episode – a one-hour average smog concentration of 0.20 ppm or above (2/3 times the state and federal clean air limits) (Gottlieb et al, 2005).

Figure 8: South Coast Air Basin smog trend



Source: Southern Coast Air Quality Management District (AQMD), 2011

lifestyle – are enormous, but remain under explored. LA can go much further through additional policies that detract attention away from the car – removing the plentiful free parking would be a powerful starting point. As more attention is given to, and policies to address climate change are implemented, efforts can be made to address some of LA's historical problems simultaneously. More attention on High Occupancy Vehicle lane provision and carpooling would not only alleviate congestion, but would also contribute to reducing the climate change impact of LA's transport. Cars will remain the primary mode of transport for many years to come, so efforts to decarbonize fuels should go hand-in-hand with efforts to reduce use. These efforts should increasingly involve the power utilities, as electric vehicles are likely to be a stepping stone, if not the technology of choice in the future. Electricity generation needs to be decarbonized.

Political and public will is crucial – and there are no easy ways to remove the cultural symbolism that the Angelenos afford the car – it's a significant part of their identity. And LA as a significant political and economic hub needs to work in collaboration with state and federal colleagues to ensure that fragmentation in decision-making is minimized – especially given the interests in and importance of land use planning and transportation funding as a means to address some of the fundamental issues the region faces. This funding needs to reflect the imperative of providing usable transit and restore the balance with highway expansion. 30/10 is ambitious, but the need to incentivize people to use the system should not be underestimated.

Although countless cities across the world are decades ahead in terms of transit provision and have much to teach Los Angeles, the US model of suburban sprawl and expansion was based on the symbolism and iconic status that Los Angeles gave the automobile in the twentieth century. So if LA can begin to redress the balance between car-dominance and large-scale transit over the next decade, then in much the same way it was a forerunner in the age of the automobile, perhaps LA can once again lead a transport revolution in the US, this time a more sustainable, social and equitable one.

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