

How Do Self-Driving Vehicles Like Waymo Impact Urban Mobility, and Do They Reinforce or Challenge Existing Social and Economic Inequalities?

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Abstract

The purpose of this article is to investigate how Waymo's development affects urban mobility and perpetuates existing inequities using a Native Feminist and Infrastructure Studies perspective. The study examines service distribution, transportation fairness, and Indigenous land use to determine if autonomous cars improve or hinder accessibility.

INTRODUCTION

Waymo is a pioneer in autonomous vehicles (AV) and has established itself as a source of sustainable and safe urban transportation (Waymo, 2024). The expansion of Waymo into West Los Angeles raises a key question: Does Waymo improve urban mobility for everyone, or does it exacerbate existing disparities? Although self-driving technology is often portrayed as a neutral invention, its implementation is inextricably linked to historic land use patterns, urban planning, and transportation equity (Goodyear, 2019). Based on Native Feminism and Urban Infrastructure Studies, this paper examines how Waymo's service regions, infrastructure, and collaborations interact with Indigenous land histories and marginalized people's access to mobility.

Waymo operates in cities such as Phoenix, San Francisco, and Los Angeles, providing services to affluent communities (Aiken, 2021). The service area of Waymo in West Los Angeles includes Santa Monica, Beverly Hills, and Century City, all of which have established public transportation and are easily accessible by foot. However, Waymo does not operate in South and East Los Angeles, which are home to numerous low-income individuals and displaced Native Americans. Waymo raises the question of whether it can increase urban mobility equitably or if it primarily serves wealthy, well-connected neighborhoods (Wray, 2023).

There is a growing conflict between the development of autonomous vehicles (AVs) and the funding of public transportation. An investment of \$5.6 billion was made by Alphabet in Waymo to expand its autonomous ride-hailing services, indicating a significant shift in private sector resources toward AV technology (Reuters, 2024). In parallel, public transportation systems, such as those in California, have been experiencing budget cuts, limiting long-term expenditures on infrastructure (UC Davis, 2024). The discussion of federal and state funding indicates a likely shift away from upgrading buses and rails in favor of self-driving vehicles in the future (Salon, 2024).

Although detailed information on public financial allocations to AV companies is limited, trends indicate a shift in resources from public to private transportation options (Salon, 2024). Other AV companies, such as Waymo, are experimenting with transit partnerships to integrate AVs into existing transit networks by offering \$3 credits to riders near Bay Area transit stations (SF Standard, 2024). As a result of this perspective, AV technology may pose a challenge to traditional public transportation funding, but it may also facilitate hybrid mobility models, depending on how cities formulate their transportation policies (UC Davis, 2024). However, Historically, urban design has disenfranchised Black, Indigenous, and other groups of color. In Los Angeles, for example, freeway expansions have historically displaced communities, resulting in a change in the city's layout to promote automobile mobility (Smith, 2012).

METHODS

The Native Feminism framework was chosen because it challenges settler colonialism, heteropatriarchy, and capitalist expansion, all of which affect contemporary urban planning and transportation infrastructure. Waymo's presence raises concerns about land dispossession, erasure of Indigenous control, and economic exclusion, which are three of the five challenges identified by Native Feminism. Land commercialization shows up in the expansion of autonomous vehicle infrastructure, where corporate interests override Indigenous sovereignty in transportation decisions. Additionally, environmental justice in Native Feminism acknowledges that the land has a historical and cultural significance beyond corporate sustainability narratives. Waymo's sustainability vision is analyzed against this framework to determine whether it promotes colonial futures or actively incorporates Indigenous viewpoints into egalitarian, land-conscious transportation.

Smith (2012) argues that Indigenous Feminism rejects the colonial legacy of displacement and exclusion perpetuated by land and infrastructure development. Historically, the Tongva and Chumash people lived in West Los Angeles, where Waymo operates. Nevertheless, the Spanish reclaimed the region, followed by the United States during its expansion. Waymo's autonomous infrastructure (charging stations, data hubs, and designated autonomous zones) is again altering land use. Does this transition consider Indigenous viewpoints regarding land, transportation, and sustainability? Even though Waymo claims to be sustainable, safe, and efficient, sustainability is usually viewed from a corporate perspective rather than an Indigenous one (Waymo, 2024).

According to urban infrastructure studies, communities prioritize private-sector mobility innovations over public transit investments (Aiken, 2021). The Waymo service map clearly shows that the company operates in wealthier neighborhoods. At the same time, public transportation is underfunded in South LA, East LA, and communities with a significant Indigenous population. Mapping Waymo's service zones versus Native American Centers may prove helpful in identifying exclusionary trends in transportation access.

Additionally, Waymo vehicles do not use freeways, which limits their efficiency (Wray, 2022). In this context, a critical question arises: Do autonomous cars contribute to improving public infrastructure or exacerbate fragmented urban mobility? The utility of autonomous vehicles as a large-scale transit option will be limited if they cannot use freeways in areas where long-distance travel is predominant. The rise of autonomous vehicles may reduce the pressure on legislators to extend bus and rail networks, further marginalizing those who rely on traditional public transportation systems.

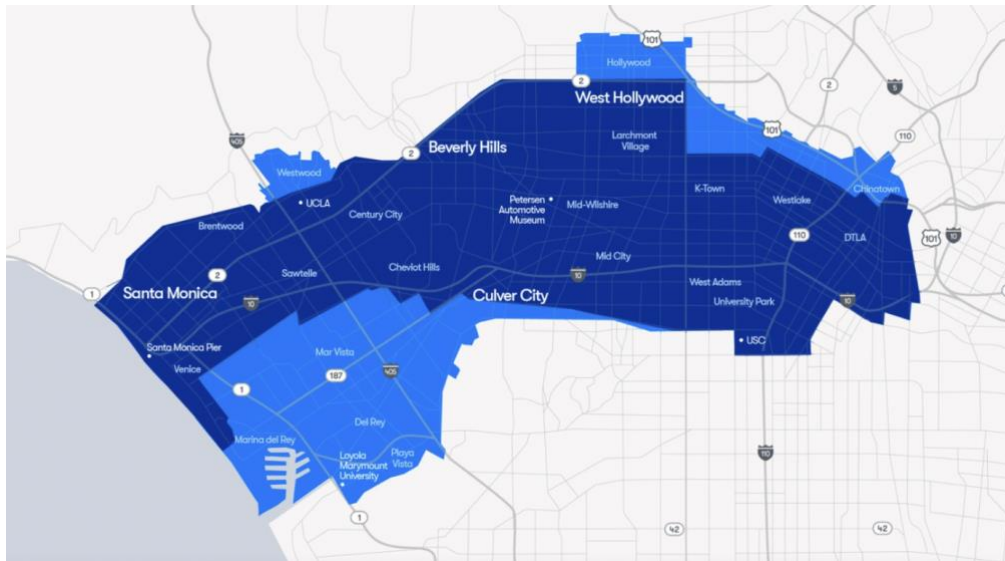


Figure 1. Waymo's Robotaxi Expansion: Mapping Coverage Across LA (Source: IoT World Today)

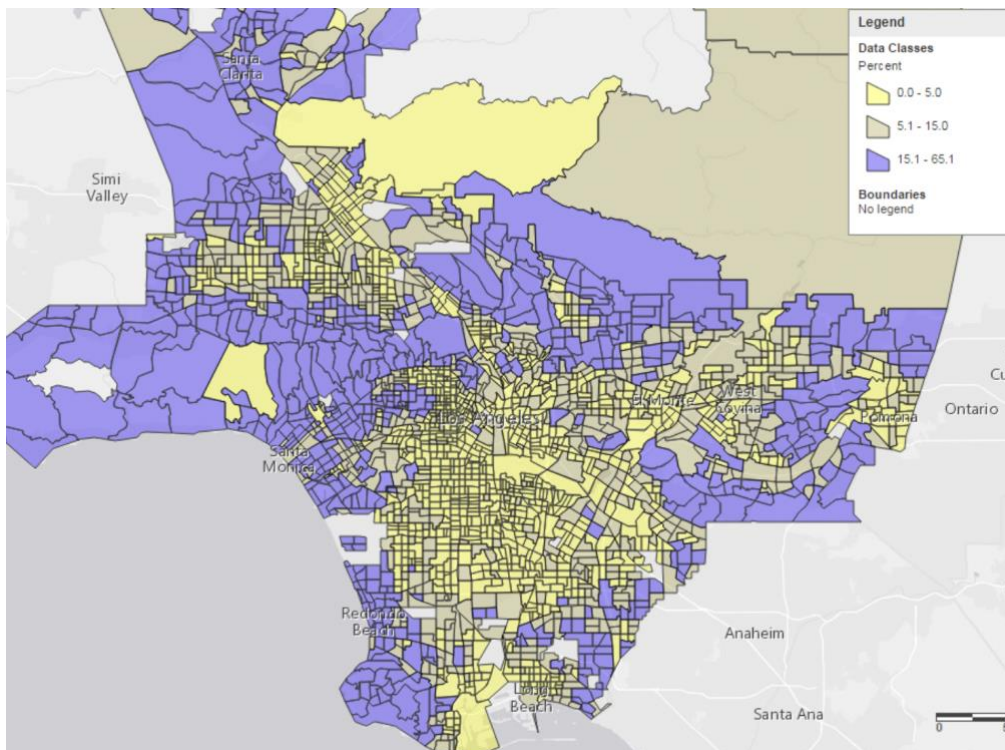


Figure 2. Map of Los Angeles showing income distribution by census tract (Source: Wikimedia Commons)

Los Angeles' income distribution is depicted in this map, with yellow areas representing lower poverty rates (wealthier areas) and purple areas representing higher poverty rates (lower-income areas). The operational zones of Waymo, based on publicly available coverage maps, are primarily aligned with yellow regions (such as Santa Monica, West Los Angeles, and Pasadena), while largely ignoring the purple areas of South Los Angeles and the Inland Empire. Due to infrastructure, demand, or commercial viability concerns, Waymo appears to serve mainly affluent neighborhoods.

RESULTS AND INTERPRETATION

Focusing on infrastructure and land development, Native Feminism criticizes colonial history of displacement and exclusion. Historically, the Tongva and Chumash people lived in West Los Angeles, where Waymo operates today. Nevertheless, settler-controlled land use decisions gradually replaced Indigenous governance under Spanish and American rule. This infrastructure for autonomous vehicles, including charging stations, data hubs, and operational zones, is yet another example of how Waymo ignores Indigenous perspectives (Waymo, 2022). The corporation touts its commitment to sustainability and community participation, but there is no evidence that Native organizations have been contacted or that Indigenous concepts of land and mobility justice have been incorporated into its expansion.

A main criticism of Native Feminism is the role corporate-led urban development plays in reinforcing settler colonial institutions while masquerading as progress. In the same way that highways and train systems historically separated Indigenous territory, AV technology is being implemented without regard to how land is used outside of capitalist mobility patterns. Although Waymo incorporates sustainability into its brand name, Native Feminism questions corporate notions of sustainability, arguing that profit-driven efficiency often takes precedence over Indigenous ecological knowledge. Historically disenfranchised regions, like South and East Los Angeles, which have long been targeted for industrial development, suffer from the environmental consequences of lithium-ion batteries, AI computer infrastructure, and high-energy data centers. Without Indigenous engagement, infrastructure growth perpetuates settler futures, in which technology serves dominant economic interests rather than being built with a decolonial and land-conscious perspective.

Furthermore, Waymo's operating footprint and expansion strategies reflect economic exclusion. Native Feminism condemns capitalist extraction, which frequently results in job displacement and economic inequality due to technological advancements. A significant number of Aboriginal, immigrant, and working-class people are employed in ride-hailing, taxi services, and public transportation, which are at risk from the AV industry. Waymo's development would exacerbate mobility inequities rather than provide a more equitable transportation system if it prioritized high-income communities. The indigenous perspective on economic sustainability prioritizes social responsibility over profit maximization, which contradicts Waymo's belief that its market-driven strategy is beneficial to all communities.

The city should compel corporations such as Waymo to complete Indigenous land impact assessments, reinvest funds in affected areas, and implement transportation planning processes that incorporate Native governance practices. Native Feminism reminds us that mobility is more than just efficiency; it's about justice - who gets access, who makes decisions, and who is excluded from the future.

Infrastructure Studies examines how transportation networks have historically reflected and reinforced social structures. The public transportation system has consistently been underfunded in favor of car-centric growth, and AV technology follows the same pattern. As

opposed to investing in bus and rail improvements, politicians are focusing on the integration of private automated vehicles, which favors wealthier and better-connected neighborhoods while ignoring lower-income neighborhoods (Goodyear, 2019). According to Infrastructure Studies, this strategy constitutes a form of profit-driven urban planning in which corporate goals influence mobility landscapes at the expense of the public good.

A significant concern is that Waymo's expansion is consistent with historical patterns of exclusion in the transportation sector. Waymo's service zones and infrastructure expenditures reflect economic and racial disparities, much as highways disproportionately affect Black, Indigenous, and immigrant communities. Businesses that provide AV solutions tend to target high-revenue locations over those that provide mobility solutions for people who are reliant on public transportation. In the absence of regulatory oversight, the development of AVs will worsen existing gaps in urban mobility, resulting in a two-tiered system in which wealthy districts benefit from investment while low-income areas remain excluded.

It is also important to note that Waymo's presence contributes to environmental inequities, which are often overlooked in discussions about AV technology. A study of infrastructure shows that urban development has historically placed pollution-intensive projects in underprivileged neighborhoods, resulting in long-term health and economic consequences. As a result of Waymo's data centers, electricity usage increases significantly, disproportionately negatively impacting low-income regions that are already polluted. A lack of accountability can result in the perpetuation of settler-colonial and class-based infrastructure policies that have shaped metropolitan environments for decades.

To prevent corporate-led transportation from exacerbate mobility disparities, regulators must take proactive measures to regulate AV businesses and ensure equitable investment in infrastructure. It is possible to achieve this by requiring that AV businesses reinvest in public transportation, subsidizing access to AV in underprivileged areas, and requiring equal service distribution (Aiken, 2021). We should put accessibility, environmental justice, and social equity ahead of corporate interests in urban transportation strategies, according to Infrastructure Studies.

CONCLUSIONS

Waymo's growth in Los Angeles raises broader questions about who benefits from autonomous vehicle technology and who is left behind. Waymo's service areas, infrastructure, and partnerships perpetuate rather than address existing urban transportation imbalances, according to Native Feminism and Urban Infrastructure Studies. For a more equitable transportation system, communities should prioritize public transit investment, Indigenous consultation, and community-driven alternatives. AV technology may exacerbate existing gaps rather than eliminate them if it is not planned correctly. As AV technology advances, we must consider whether we are building cities for corporate convenience or collective mobility.

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