

Coalition Cartography

Mapping Urban Governance and Transportation in 20th-Century California

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List of Abbreviations

CAHSRA	California High-Speed Rail Authority
CDH	California Department of Highways
CDPW	California Department of Public Works
CDT	California Department of Transportation (Caltrans)
CHC	California Highway Commission
CHD	California Highway Department
LACTC	Los Angeles County Transportation Commission
LACMTA	Los Angeles County Metropolitan Transportation Authority
SCRTD	Southern California Rapid Transit District

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Abstract

Maps are tools that shape the territories they depict. When subjugated to the interests of states, maps and mapping are deployed as tools to help delineate, administer, and develop territories across scales. In U.S. cities, coalitions made up of governmental and non-governmental actors are the managers of these processes. However, the specific roles of mapmaking in the activity of governance coalitions remain relatively unexplored. How are maps and mapping used by governance coalitions to imagine and gain political support for their spatial goals at the urban scale? In this thesis, I examine the connection between mapping processes and urban governance coalitions using two examples from 20th century California. The first case examines a map produced by the Los Angeles County Transportation Commission in 1980. This map was produced from a political compromise over the development of a metro system for Los Angeles, and it was circulated to millions of voters in order to garner their support for a ballot referendum. The second case considers how maps supported the efforts of the California Highway Commission to imagine and promote the development of California's state highway system between 1910 and 1940. I link the politics of mapping to the politics of urban governance by connecting the literatures of critical cartography and urban regime theory. In so doing, I argue that the imaginative power of maps renders even very ambitious infrastructural projects as feasible, contributing to their prioritization by urban coalitions and therefore their realization. In the U.S. context, this imaginative power makes the production and circulation of maps an integral part of urban coalitions' approach to governance.

Chapter 1: Introduction

Ye of Little Faith

On a sunny September day in the late summer of 2023, the heavyweight transit providers serving Los Angeles County – Metro, Metrolink, and Amtrak – hosted the public at the city’s landmark Union Station for a daylong festival of rail history. In a city famous for its relationship to the personal car, it was a rare sight: throngs of people of all ages, turned out on a Sunday to the busiest train station in the American West¹ to climb aboard historic locomotives, fawn over intricate model railways, and learn about the city’s roots in rail. In the station’s main plaza, the organizers hawked tote bags and pamphlets. Metro, the county’s bus and rapid transit agency, drew the biggest crowds; Amtrak, the U.S. national railroad company, drew kids and trainspotters; Metrolink, L.A.’s neglected regional rail system, didn’t draw much of anyone at all. A fourth exhibitor, peripheral to the action, was outstanding, but not in a good way. It was the only agency there that had no passengers, no stations, no track, and no trains.



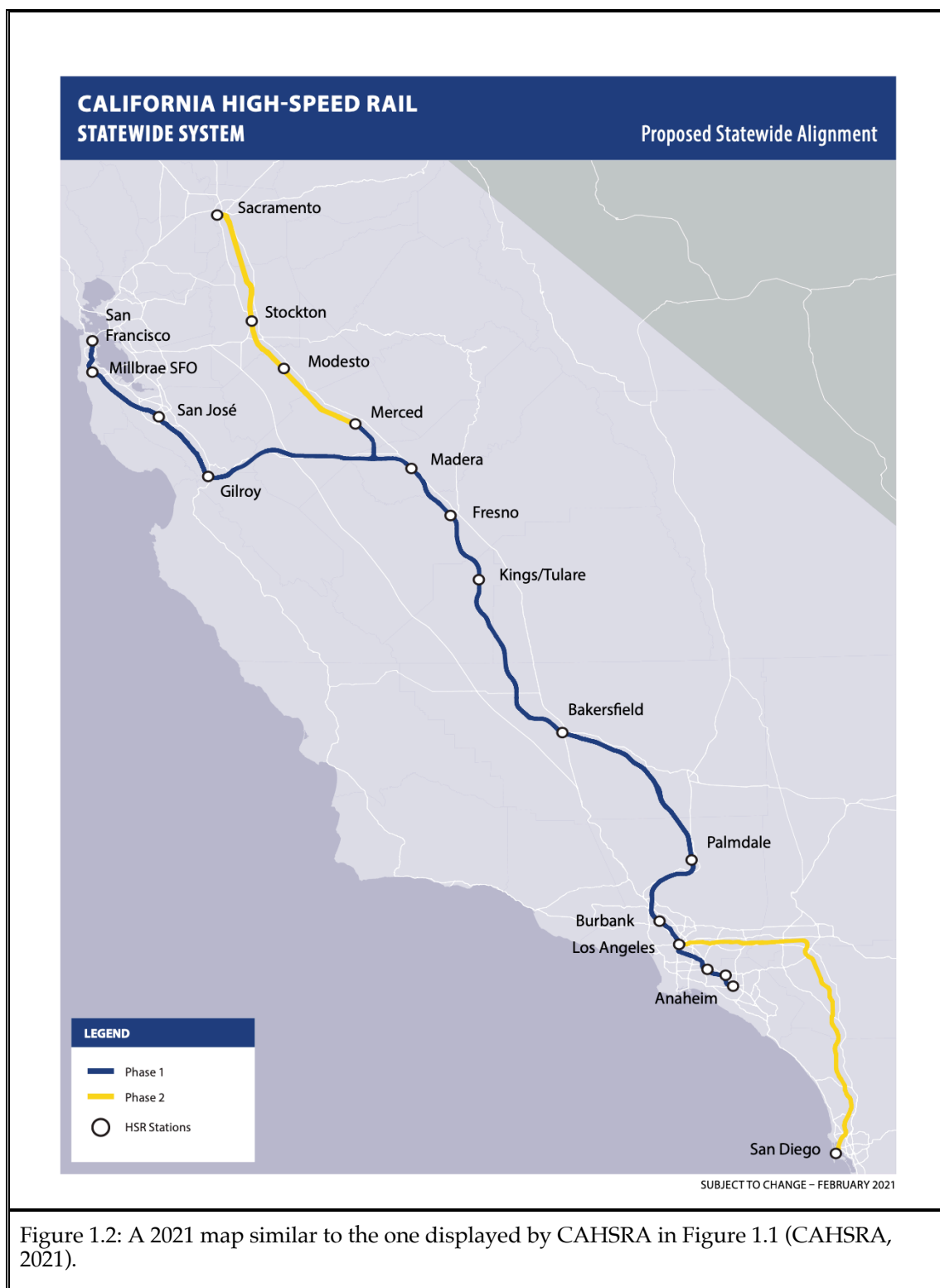
¹ Exact figures are hard to quantify due to the station’s use by several different transit agencies, but it is likely about 100,000 people per day.

Figure 1.1: The California High-Speed Rail Authority exhibiting a map of their planned system at L.A.'s Union Station, 10 September 2023 (author photo).

What the California High-Speed Rail Authority (CAHSRA) did have that day was a map (Figure 1.1). Mounted on a piece of foam-core, it wasn't a terribly convincing symbol of progress for a system that after thirty years of study, planning, legislation, and construction, is predicted to significantly exceed its original budget and has only modest construction progress to show. The map depicted the cartographic ideal of a system – but nonetheless a system that did not exist.

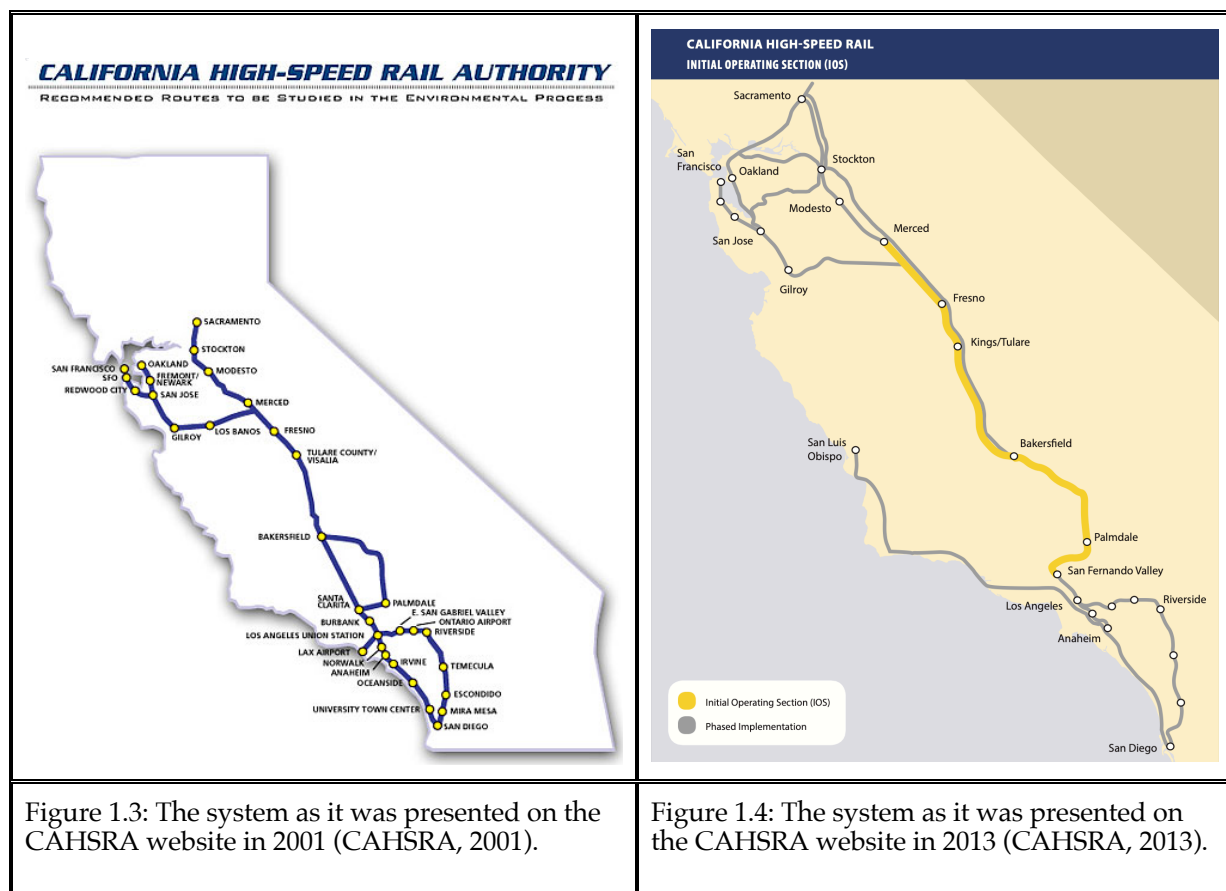
The map displayed by CAHSRA did have something going for it, namely, decades of political sunk costs – in 2008, thirteen million Californians, largely in the state's coastal, urban counties, had voted in a referendum in which 52% of them approved that "\$9.95 billion in bonds be issued to establish a clean, efficient high-speed train service linking Southern California, the Sacramento/San Joaquin Valley, and the San Francisco Bay Area" (California Secretary of State, 2008, p.3). The text was the legal antecedent of the map, and so the map reflected the will of the voters – the will of the state! Behind it the map also had a deeper conviction that realizing ambitious infrastructure was a California tradition: as an early CAHSRA newsletter put it, "The construction of the HSR network would be a public works program on the scale of the State Water Project or the creation of the state's freeway system" (CAHSRA, 1999, p.1).

What of the fact that the project was anticipated to cost more than ten times that initial amount, more than \$100 billion? What of the fifteen years of slow progress, political infighting, and federal meddling? Through all of it, the map endured (Figure 1.2).



This map – this flimsy, printed thing, baking in the California sun – was so much more than a physical placard. It embodied years of campaigning and compromise, years of conflict, cost overruns, and crises of confidence. Calls to scale the system back, or scrap it all together, have failed to convince, while the map has retained the power to make believe. The promise of “Connecting California” has been repeatedly made *through this map*, and the map has withstood. For twenty-five years, the state has stuck by their map – in some ways,

perhaps, beyond reason – and what the map shows has come to structure state politics in turn. The quest to build not just *a* high-speed rail system, but *this particular* high-speed rail system has roiled politics up and down California – many are against the system, as well as for it – and strained the state budget for more than a decade. The map has helped encourage property speculation in the Central Valley; promote the redevelopment of downtown Fresno; and has been the predicate of assumptions about the state’s development trajectory for close to a generation.



The map endures because to change the map is acknowledge that the state cannot transform territory at the stroke of a pen – it would be tantamount to admitting, through cartographic revision, the fading omnipotence of California’s government over the landscape it has shaped for nearly 175 years. This is not the first, nor the only, example of such a phenomenon; in some ways, as I will argue, maps like this one are a tradition of California’s decision-making over infrastructure. As I will show, maps like this one have had power over politics in California for at least a century, and their production and circulation in the public discourse has been agential in the realization of ambitious projects in the past.

As for the map in Figures 1.1 and 1.2, the future is unknowable. That day, I struck up a conversation with the two CAHSRA representatives attending their booth. We exchanged pleasantries, remarked on the heat, and discussed the project’s progress “up north,” which

they assured me was significant. They were optimistic about the timeline, which is said to see the first trains travel on a section from Fresno to Merced sometime in the early 2030s. There is no estimate of when the full San Francisco-to-Los Angeles system will be completed, but at this point, even 2040 would seem ambitious.

As I left, one of them handed me a printed campaign sign with an illustration of a fast-moving train. Underneath, the sign read, "*I Will Ride* California High Speed Rail," a prayer for those of little faith (Figure 1.5).



Figure 1.5: The campaign sign for I Will Ride, a state-backed advocacy group supporting the CAHSRA system plan (author photo).

When, why, and how do maps become objects around which we start to organize ourselves – and our governments? How do maps behave, and make *us* behave, when they are used as tools to imagine territory? This thesis takes up maps as an expression of politics and asks whether and how maps come to structure not only the way territory is *seen*, but also how it is *acted upon* by coalitions that govern. I begin from the premise that maps do not only describe the world; they do work on the world. Maps have reinforced territorial claims by states and empires, undergirded systems of property ownership and resource allocation, and helped to construct the spatial imaginaries in which individuals live, work, and move. It follows that the power of maps extends far beyond their function as navigational aids or

simple representations of geographic space. Instead, they are dynamic tools that shape and influence the development of landscapes, reflecting and reinforcing the political and social objectives of their creators.

Problem Statement

Although critical cartographers have long recognized the power of maps in society (Wood & Fels, 1986; Harley, 1989; Wood, 1992; Pickles, 2004), more recent critical cartographic literature has called to examine the role of maps and mapping in the grounded context of how and where maps are produced and concretely used, especially in everyday life (on map production, see Boria & Rossetto, 2017; Duggan, 2019; Rossetto, 2019; Driesser, 2021; on map circulation and usage see for example Duggan, 2021). At the same time, in literatures more concerned with examining how urban governance is achieved (Stone, 1989; Savitch & Kantor, 2002; Stone, 2015), mapping remains largely absent from theoretical models, even as it has become a methodological approach to historical research (see for example Howell, 2017). This absence is conspicuous because territorial interventions by governance coalitions are often inextricably linked to efforts to imagine or reimagine territory through mapping.

If maps have the political power attributed to them by critical cartographers, then so must their production and usage in everyday life, including everyday politics. Therefore, situating the role of maps and mapping in discussions of governance presents a two-way opportunity. For critical cartographers, doing so might help to go beyond the established idea *that* maps do work on the world, and toward demonstrating *how* maps and mapping processes do work on the world. And for scholars of U.S. urban governance, highlighting the imaginative power of mapping within governance coalitions might help to show how expertise – cartographic or otherwise – is not an inert resource but rather a tool whose affordances can constrain as well as advance the range of possible outcomes. By “affordance” I mean the potential actions made possible or impossible by the specific characteristics of a given tool, object, or environment, in this case the map.

This research therefore aims to interface between more abstract theoretical discussions of critical cartography and the concrete policymaking of urban governance. By placing maps at the center of a discussion of political decision-making, this thesis underscores maps’ role as active agents in shaping urban landscapes. In so doing, I hope it will shed light onto the ways in which maps contribute to the ongoing development of cities and regions, highlighting their lasting influence on the present and future of urban development.

Research Aims & Objectives

The aim of this research is to examine how maps are used by urban governance coalitions in order to achieve their specific political goals. Toward this general aim I have three more specific objectives. First, I aim to show that mapping has been central to establishing and

circulating specific images of or ideas about urban territories. Second, I aim to demonstrate that maps and mapping are central to efforts to organize coalitions around these images and ideas. And third, I aim to show that mapping has a potent imaginative power not only at the national or international scales, but also at the scale of the urban.

Research Questions

My central research question is: *how have maps and mapping been used by governance coalitions to imagine and gain political approval for their spatial goals at the urban scale?*

Under this question I pose several sub-questions:

1. Who are the members of such coalitions and what are their spatial goals?
2. How do these coalitions use maps and mapping to reach these goals?
3. What technical and aesthetic approaches characterize such mapping efforts?
4. How do these reflect the politics of mapping?

Key Argument

My central argument is that maps and mapping are indeed used by urban coalitions to achieve their goals; furthermore, I argue maps and mapping are a foundational form of expertise that urban governance coalitions use to imagine and accomplish their political development goals. The power of maps makes them critical tools for development coalitions to imagine and achieve political support for their goals. In particular, the ability to make a project seem feasible is a key power reserved by maps and mapping; and, because accomplishing goals is seen as a marker of a successful governance coalition, goals which are made to seem feasible to accomplish tend to be allocated resources by coalitions. This increases the likelihood of their accomplishment in a somewhat self-reinforcing cycle. The power of maps and mapping to authoritatively make coalitions believe they can accomplish something comes to structure a cartographic approach to problem-solving. What can be mapped therefore has a propensity to be built.

Terminology

Debates over what exactly a “map” is transcend questions of terminology into philosophical and epistemological questions beyond the scope of this short discussion (see Andrews, 1996). However, the boundaries around what is or is not a map have generally become broader and more porous in recent years. Edney (2018) building on Wood (1992) proposes a definition of maps and mapping that incorporates a wide variety of spatial representational strategies: “mapping,” he writes, “is the representation of spatial complexity,” while the “map” is a “text representing spatial complexity” (Edney, 2018, p.41). In other words, maps are the products of mapping, which is a process of representing spatial complexity. I adopt this usage of the terminology of “maps and mapping” also to denote the separate but closely related map-object (e.g., the printed map, the digital mapping application) and the process

of mapping (the production and dissemination of maps). I discuss this distinction in more detail in the next chapter; but generally, I use the terms together to show that map objects do not stand alone but rather are a product of a social process, that is, mapping. However, for specificity in some cases I use only one of these two words.

I define urban governance coalitions according to Stone (1989) as the formal and informal partnerships among governmental and non-governmental actors in who together mobilize resources in order to realize shared agendas at the urban scale. "Governance" is a term that is wider than "government," in that it includes non-governmental actors who together with governments make up a "coalition."

Of the two coalitions I will discuss in this thesis, the coalition responsible for constructing California's first system of statewide roads in fact operated across *multiple* urban areas rather than in a single city. I nevertheless apply the term "urban coalition" and "urban governance" to this case because the although the coalition was preoccupied with the transformation of urban, suburban, and rural landscapes, its efforts served urban economic interests; facilitated intercity mobility and trade; and connected cities with their hinterlands. Furthermore, the members of this coalition, including banks (on whose investment the project depended), influential elites, and the bulk of voters on whom the roadbuilding project depended, were based in California's major urban centers around Los Angeles and San Francisco. Finally, I have chosen to conceptualize this coalition as "urban" because it played a leading role in rescaling what was considered urban in California by facilitating access to trade, housing, and employment in formerly peri-urban regions.

I use "territories" in a relatively straightforward sense, i.e., as "A unit of contiguous space that is used, organized and managed by a social group ... or institution to restrict and control access to people and places" (Gregory et al., 2011, p.746). Finally, "spatial goals" is a deliberately wide term for physical interventions that governments make in the territories over which they exercise responsibility.

Theoretical & Methodological Approaches

I examine the interface between maps and mapping and urban governance by connecting two theoretical bodies of literature, namely that of critical cartography and urban regime theory (URT). As I stated earlier in this chapter, I adopt this theoretical approach as a response to the conspicuous absence of mapping from grounded debates of governance at the urban scale and in order to connect the politics of mapping with a model of how politics is manifested in cities. While previous critical cartographic studies have often focused on the representational and naturalizing power of maps in shaping national or imperial identities, this thesis argues that maps also wield significant inventive power at the urban scale. This inventive power not only influences contemporaneous understandings of territories but also shapes visions of those territories' future development trajectories. Urban regime theory provides the formal model to understand how urban regimes change cities over time. URT

posits that urban development is driven by coalitions of governmental and non-governmental actors who mobilize resources to achieve shared goals. This thesis argues that maps play a crucial role in this process by making certain spatial goals appear more achievable, thereby becoming central to coalition priority-setting. Maps and mapping are a kind of expert resource available to coalition, but one that can be mobilized for political as well as technical ends.

Methodologically, I take an historical geographic approach, drawing on archival materials, including maps, administrative documents, and other related primary and secondary sources. The reasoning for such an approach is that the effects of decisions concerning territorial management can take decades or longer to manifest; a long-term view is therefore essential to unpacking the effects of mapping on governance over time. Also, maps and related administrative documents offer anchor points in time and space with which we can compare the present to the past – by unearthing old maps, I am quite literally geo-referencing how official ideas about territory from the past are linked to the consequences of those ideas in the present. This requires historical perspective and an understanding of the geographic configuration of territories on the time scale of multiple generations. Finally, most of the human actors involved in these decisions are long since deceased, which precludes interviews, surveys, and participant observation as other qualitative methods; however, the ideas and beliefs of my subjects live on in some fidelity in the contemporaneous records of their actions and the landscapes that have resulted from these actions.

Empirical Case Studies

Two case studies form the empirical basis of this thesis: the first examines a map deployed as part of a 1980 referendum campaign on a proposed metro system for Los Angeles County. In this case, the map in question became central to the political compromise made by the members of the competent commission for public transportation development in Los Angeles County; additionally, the map was used to shape the public's impression of how and where funds raised by a countywide tax would be spent. The map was deployed in official voter information materials to garner public support around a specific configuration of the metro system.

The second case follows the evolution of mapping during the development of California's first statewide road system from 1910 - 1940. I show how maps of the system, distributed over many years in an official publication of the California Highway Commission, were part of an effort to promise, promote, and deliver an ambitious program of roadbuilding connecting California's cities both to each other and to their hinterlands. This included efforts to organize political support for bond measures underwriting the system, as well as circulating idealized images of a car-oriented future.

Structure

Following this introduction (Chapter 1), the thesis is structured as follows: in Chapter 2, I review relevant literature and develop a theoretical framework to analyze my empirical cases. In Chapter 3, I discuss the methodological approaches taken to answer my research questions. The first of two empirical case studies, that of the political use of a diagram of a proposed metro system for Los Angeles, follows in Chapter 4. Chapter 5 concerns the usage of maps to plan and promote the development of California's system of statewide roads. In Chapter 6, I discuss both cases together and link them back to the relevant literature discussed in Chapter 3. Chapter 7 concludes by summarizing the preceding chapters and suggesting possible avenues for future research.

Chapter 2: Literature Review

If maps “do work” on the world, how has this power previously been conceptualized? In this chapter, I examine the ways that others have understood the power of maps, gathering the various arguments around three conceptual categories. I gather the power of maps into three categories, arguing that maps and the process of mapping have been understood to have the power to 1.) make truth claims about the nature of territory; 2.) naturalize specific ways of seeing that territory; and 3.) materialize new spatial patterns of resource allocation. Each of these modes of power has an effect on real-world decision-making.

While the use of this power has previously been attributed to projects of nation- and empire-building, I suggest that it also has important implications for urban governance. Therefore, developing a connection between the literatures of critical cartography and a leading theory of urban development in the U.S., namely urban regime theory (URT), I next link the power maps apparently have to shape territory to the powers that urban coalitions rely upon to set and realize their political goals. As persuasive instruments used to organize coalition partners around shared conceptions of territory and agreed-upon allocations of resources, maps are a fundamental tool for sustaining and reinforcing the power of urban coalitions.

Critical Cartography & GIS: Maps As Tools

Beginning in the mid-1980s, the critical turn in the study of cartography fundamentally refocused debates in the study of maps and mapping. Echoing critiques leveled since the 1970s of the postwar ascendancy of positivist “spatial science” and the cartographic discipline’s quest for technically optimal mapmaking, critical cartographers instead argued the need to examine the role of maps in society (Ash et al., 2016; Kent & Vujakovic, 2018). Maps were unpacked to highlight their political meanings (Wood & Fels, 1986); identified as a form of representational power – state, imperial, and beyond (Harley, 1989); and shown to work in the world by through this representational power (Wood, 1992; Wood & Fels, 1992). Cartography was reconsidered through new lenses: historical accounts challenged the narrative of linear “scientific” progress in European mapmaking (Edney, 1993); engagements with Indigenous ways of knowing space showed the limits of Cartesian mapmaking, even when subjected to postmodern critique (Rundstrom, 1991); and mapmaking was demonstrated to possess the potential to subvert as well as to reinforce existing structures of power, especially in the city (Pinder, 1996).

These critical perspectives gathered momentum with the spread of GIS, sharpening critiques of mapmaking amid a rapidly evolving technological landscape. Critics argued that while GIS was evidently a useful tool of *information* management, it could not produce *knowledge* as such (Taylor, 1990). The “outlandish disciplinary ambitions” Smith (1992) attributed to Openshaw’s (1991) claims that geographers would soon flit between rigorous

spatial analyses of all kinds of phenomena (on this planet and on others) were called “grandiose” and “Messianic” (Smith, 1992, p. 258). Moreover, it was argued, a blind return to the old positivism was not only intellectually fruitless; it was immoral. Critics contended that it was impossible to disentangle GIS from its utility as a tool, like cartography before it, for imperialist and colonial projects; Smith (1992), for example, argued that Gulf War was in fact “the first full-scale GIS war” (p. 257). Moral imperatives in favor of GIS were identified on the other side, too: deploying the new analytical tools to identify and understand unseen relationships or patterns in space, for good (Openshaw, 1991). A divide solidified between critics, who were inclined to view GIS as an intellectually limited tool whose use portended a return to the detached descriptivism of regional geography, and supporters, who argued GIS gave the geographic discipline new powers, namely a renewed scientific legitimacy (Schoorman, 2000). The battle lines mirrored those of the broader “science wars” in which the favored position of scientific ways of knowing was increasingly subjected to cultural critiques (Schoorman, 2000). Successive waves of criticism and defense of GIS in the 1990s coalesced to some extent around a recognition among geographers of the possibilities presented to the geographic discipline by GIS and an appreciation of the need for a more reflexive approach to GIS among its proponents (Schoorman, 2000; Crampton, 2010).

The arrival of the geoweb again changed the terms of debate within studies of maps and mapping. The proliferation of volunteered geographic information (VGI) and lay cartography implicated new groups in mapmaking (Leszczynski, 2011). Relatively suddenly, mapmaking was an activity being undertaken by millions of amateurs rather than a narrower group of specialists. The further debut of location-aware applications on smartphones has implicated billions in the production and circulation of geographic information, which has been commodified (Alvarez León, 2016; Thatcher, 2017). This process has contributed to the development of urban technology platforms such as ride-sharing, short-term housing rental, co-working spaces, and micro-mobility services, which increasingly characterize everyday life in the contemporary city, even as they are identified as drivers of gentrification, displacement, and exclusion (Leszczynski, 2020). The ascendance of “big” geographic datasets, such as geotagged volunteered photos or real-time social media posts, augured a new panoptic view of geographic phenomena, especially during natural disasters and mass events (see Zook et al., 2010; Shelton et al., 2014). At the same time, the pitfalls of relying upon such datasets extend longstanding concerns about statistical analysis of geographical data, including whether such datasets can be considered representative (Crampton et al., 2013). These debates follow from the work of critical cartographers, reinforcing the idea that the production, circulation, and analysis of geographic information is not apolitical, but rather has social and political effects in the world.

The observation *that* maps are tools for doing work on the world has been constructed throughout these debates, but *how* maps do work in the world is not always in the foreground. Crampton (2010) observed that a leading response to accusations of the benevolence or malevolence of mapping and GIS was the flawed claim that “maps and GIS are ‘neutral’ technologies” which have no particular moral or political valence; rather, it is the specific usage of these tools that determines whether they help or harm (p.8). But the “economy of morality” which balances the good and bad uses of maps like debits and credits in a ledger, Crampton suggests, elides a recognition that the use of specific tool structures our approach to problem-solving (Crampton, 2010). Crampton implies that maps cannot be considered as “neutral” tools because although tools can be used for good or for ill, no tool can escape its affordances. There is no such thing as a neutral tool.

Recall the adage: “if all you have is a hammer, everything looks like a nail,” which means that one’s approach to problem-solving is constrained by the affordances of our available tools.² The aphorism also implies that our tools have the tendency to make us see all problems as manifestations of a single type, i.e. as nails. This a simplified but useful way of restating Crampton’s implication: mapping structures our approach to problem solving, not only because we are constrained in our actions by the affordances of maps, but because we begin to flatten all *problems of space* into *problems of mapping*. Therefore, it seems important to understand what kinds of affordances maps possess – what kind of tool is a map? I turn next to the specific kinds of “political work” performed by maps in the world to unpack how maps do work in the world.

Representational Power: Maps Make Truth Claims

The first generation of critical cartographic scholarship emphasized the truth-claiming powers of maps. Tracing the contours of broader postmodern trends, critical cartography destabilized the idea of cartographic representations as static, truthful images of territory. Instead, scholars like Harley (1989) argued, maps should be understood in line with other forms of text: arising from and imbued with the values of socially produced systems of knowledge (Harley, 1989; 1990). Within these knowledge systems, maps have power to do work in the world, a translation into the domain of maps and mapping of the Foucauldian view that power and knowledge are necessarily intertwined as power-knowledge (Harley, 1989). Following the lead of Roland Barthes (1972), Wood (1992) argued that maps’ power emerged from their repetition and naturalization of *sign systems*, in order to lay truth claims about the nature of territory. Wood & Fels (2008) summarized this power as a unity of claims to existence and claims to location: “Insisting that something is *there* is a uniquely

² Although sometimes called the “law of the instrument” and attributed to Maslow, the phrase is traditional.

powerful way of insisting that something *is*" (Wood & Fels, 2008, p.191, emphasis in original).

Consider by way of example the representation of the borders of the State of California on a map. The representational enclosure of a certain part of the earth's surface within the thin black line comprises the following proposition: this part of the Earth's surface is a differentiated territory called California. It simultaneously makes the claim that because the specified area is California, and that a state called California exists. The map undergirds both declarations of location, by visually asserting a territorial claim, and declarations of existence, by assigning a meaning to the territory. This is the first form of work done by maps in the world.

Wood (2010) later called this the "propositional logic" of mapping, arguing that the power of the map "was a function of" such "spatial/meaning propositions" which he called *postings* (Wood, 2010, p.52). The authority of a map derives from the repeated social assent given to the factuality of the map's propositions, in the form of linkages among actors and processes in that territory (Wood, 2010).

Naturalizing Power: Maps Naturalize Territory

Maps do not only represent territory once; they continually re-assert and naturalize the territories they depict. Especially in the West, this "uniquely powerful" (Wood & Fels, 2008, p.191) character of mapmaking has long been recognized and cultivated, adding up to what Pickles (2004) argued was our *geo-coded world* in which maps and mapping are fundamental not only to the structuring of territories, but also to the structure of knowledge itself (Pickles, 2004). Pickles sought to go beyond assuming the map's power derived from its *representational* abilities alone. Instead, he understood the multiple ways maps act in the world (and how we act upon maps) as a process of *territorial production*, in which:

Cartographic institutions have coded, decoded and recorded planetary, national and social spaces ... Just as scientific facts are produced through the overlay and repetition of circulating references (Latour 1999) ... territories are produced by the overlaying of inscriptions we call mappings (Pickles, 2004, p. 5).

The reference to Latour prompts us to interpret *inscriptions* as records of human actions with agency – overlaid inscriptions have the power to influence behavior and structure social relations. For Pickles, maps also do this work in the world through a process of naturalization, "reproducing a particular sign system and at the same time treating that sign system as natural and given ... [maps] let us see the world how others have seen it and how they want us to see it" (Pickles, 2004, p.61). Yet, a map "is not a representation of the world, but an inscription that does (or sometimes does not do) work in the world" (Pickles, 2004, p.69).

Returning to the example of a map of the State of California, consider that the notion of a “territory” in that particular area of the Earth’s surface does not exist until such a territory is proposed and naturalized on the map. The map precedes the territory because unmapped territories are not really territories at all, at least from the perspective of the mapmaker. It is the repetition of a claim, the repeated proposition of territory, that naturalizes the notion that “California” is a territory of a state by the same name, that its capital city is Sacramento (for territories must have capitals!), that its borders stretch north to the Cascades and the territory called Oregon and south to another territory called Baja California, and so on. The work that is done is quite literally state-building: legitimizing California as a territory and foreshadowing its institutionalization and governance, each time the map is encountered.

We, too, are participants in this naturalization process. When Kitchin & Dodge (2007) responded directly to Harley, Wood, and Pickles in questioning the ontological security of the map object, chief among their concerns was how “practices based on learned knowledge and skills re(make) the ink into a map ... *every time* they are engaged with” (p.335, emphasis in original). This perspective casts doubt on the stability of a map’s existence as cleanly separable from its users. There is no escaping one’s own subjectivity in the recognition, interpretation, and translation of map signs. Therefore, naturalization emerges between the map (for Kitchin & Dodge, nothing more than “simply coloured ink on a page” or a digital equivalent) and the performer, i.e. user (Kitchin & Dodge, 2007, p. 335). Maps are *ontogenetic*, Kitchin & Dodge argue; they only come into being in the moment they are encountered (Kitchin & Dodge, 2007). So, they argued, mustn’t we study *mapping processes* and *mapping practices* in order to examine *mapping*? This means going off-page and unpacking the contexts in which maps emerge: who is doing the mapping, and why? Where is the map being published or read? What are the consequences of the map’s being in the world? This is what Kitchin & Dodge (2007) called a *processual* approach to critical cartography, and what others (Edney, 2018; Rossetto, 2019) have called the “post-representational” and “object-oriented” approach. Placed into contrast with a strictly “critical” approach, object-oriented cartography ought to take into account not only the textual but also the everyday and material dimensions of cartography – in other words, the lives of maps in the world. Dodge, Kitchin, and Perkins (2009), who argued that studies of maps and mapping should in particular consider the modes, methods, and moments of mapping (i.e., the subjects of mapping, the ways maps are made and used, and the places and times where mapping is employed), has been particularly influential in this current. Numerous subsequent studies have taken up their approach, including those which trace everyday uses of mapping-in-the-moment (Wilmott, 2016; see also Wilmott, 2020); examine practices of mapmaking through ethnography (Boria & Rossetto, 2017; Duggan, 2019) and autoethnography (Duggan, 2022); and follow the circulation of maps in broader media

discourses of migration (Lo Presti, 2019), nationalism (Rossetto & Lo Presti, 2022), and the covid pandemic (Kent, 2020; Pase et al., 2021). These studies generally emphasize that the representational power of maps is not only in their content (the “ink on a page”) but in their presence in and relationship to the world, especially to their human users.

Drawing on object-oriented ontologies, which emphasize the agency of non-human objects in the world, Rossetto (2019) called to examine “maps as images among other images, as visual objects among other visual objects, and as things among other things” (Rossetto, 2019, p. 7). Following an object-oriented approach, Edney (2018) has suggested examining map images as they are *produced*, *circulated*, and *consumed*. He argues that the conceptual focus by critical cartographers on the “map” itself is misdirected, setting the “ideal of cartography” as the appropriate category of analysis, which he describes as “an interlocking and resilient web of mutually reinforcing preconceptions, each of which sustains basic convictions that seem to be common-sense propositions about the nature of maps” (Edney, 2018, p.4). Each of these mutually affirming “preconceptions,” Edney argued, facilitates “naturalizing cartography and normalizing ‘the map.’” (p.5). Nonetheless, the mapped image remains prominent in both Rossetto’s (2019) and Edney’s (2018) empirical examples of the processual approach, even if it is only the tip of an iceberg.

Vujakovic (2002; 2014; 2017; 2020) has consistently tracked the circulation of maps, especially maps of armed conflict, in news media. Most recently (2020) he has argued that despite frequently adversarial, and occasionally orientalist, coverage by Western news media, the “cartographic precedent” established by circulating maps of Chinese territorial claims in the South China Sea regardless serves to reinforce their legitimacy. In this way, the claims are solidified unintentionally; nonetheless, the map object’s circulation has power.

So far, we have seen that the *naturalizing* power of maps has been identified by numerous scholars as core to the ways maps do work on the world. Connecting the map’s propositional logic to its naturalizing abilities suggests that maps simultaneously make claims about the actors, spatial relationships, and physical nature of territories at the same time that they affirm them. But whether maps’ power arises from a stable representational status, the summation of momentary encounters between humans and maps, or from the wider network of preconceptions and ideas connected to cartography, there is consensus that mapping is a powerful tool for naturalizing certain perspectives on and beliefs about territory. These perspectives and beliefs in turn affect decision-making about the management and use of that territory.

Materialization Power: Maps Invent Territory

Significant attention has been devoted to questions of whether and how maps can naturalize spatial ideas or images in a more proactive or inventive way. Can they *invent* wholesale new spatial paradigms? What if Wood’s “*this is there*” dualism was extended to the future tense:

this will be there? We have seen that maps have the power of path-dependency – what was mapped yesterday will be taken into consideration today. But what about path-breaking – what is mapped today will become tomorrow? Previous work has identified the power of maps in this mode.

The futures presented on maps can have persuasive political meaning, and can be used by governments as well as by citizens to argue for their own versions of the future (Krygier & Wood, 2011):

Different goals call for different maps ... Think of a map *as a kind of statement locating facts*. People will select the facts that make their case. That's what the map is for: to make their case (p. xiii, emphasis in original).

In Krygier & Wood's hypothetical example, a map is deployed by local residents of a typical U.S. city to counter the local government's proposal (also rendered in map form) to build a bypass road. The local residents do so by mobilizing various thematic data: locations of African-American community institutions; flood-prone areas; locations of historic structures, and so on (Krygier & Wood, 2011). By demonstrating that the development will have real downsides for their community and proposing alternatives to the bypass road with maps, the local residents successfully halt the project. Thus, the power of maps to envision the future is highlighted at both extremes of the power structure.

Aalbers (2014) examined the *performativity* of maps, which he argued "means that [maps] can have the reiterative power to produce the phenomena that they regulate and constrain" (Aalbers, 2014, p. 549). Citing redlining maps of Baltimore and Philadelphia, along with the cases of New York's implementation of planned shrinkage policies in the Bronx under the broader Federal strategy of "benign neglect," Aalbers argues that these maps "prescribed disinvestment" (Aalbers, 2014, p. 549). These maps, Aalbers contends, created specific *conditions of possibility* which structured the range of likely outcomes of the mapping processes themselves. This points to the inventive power of maps. But might maps do more than reiterate, regulate, or constrain? I suggest that the prescriptive mode Aalbers cites is analogous to what Aalbers has called elsewhere "regulated deregulation" (Aalbers, 2016), articulated to the context of mapping.

Regulated deregulation describes the ways in which the project of neoliberal "deregulation" was not a simple matter of more vs. less regulatory oversight; rather, regulations were re-structured to preference certain actors and actions over others (Aalbers, 2016). In a similar way, maps do not only *constrain* or *prescribe* (which seem to me to be terms of limitation), but also *promote* and *encourage* certain kinds of actions in certain places; they *regulate* activities in order to *facilitate* them as much as to slow it. Consider that when a U.S. city or county maps out or "plats" a new area of land, they are effectively "creating" new discrete pieces of territory whose cadastral title they regulate and tax; this act facilitates sales and development of lots, as well as borrowing against whatever value such lots might have.

Not coincidentally, the term “plat” refers both to an area of land and the process of planning or plotting its boundaries (Oxford English Dictionary, n.d.). The process of mapping helps bring these places into being – the map empowers the law, and the law empowers the map.

In her doctoral thesis on mapping in the Arctic, Lindberg (2019) dubs this process *cartographic materialization*, which she offers as her contribution atop what she groups as Harley’s focus on *cartographic truth claims* and the more Wood-Pickles framework she gathers around the concept of *cartographic naturalization*. Cartographic materialization, she argues, is the process by which “maps not only can constitute ‘reality’ today, but also can constitute what is not yet materially ‘real’: maps can contribute to *enabling particular expectations about the future*, which can later materialise as a map’s *ideational power*” (Lindberg, 2019, p.65, emphases my own).

Along these lines, Vujakovic (2017) has argued that maps can establish *cartographic precedent* in which “maps convey a particular image of ‘reality’ in advance of that reality, potentially precluding or prejudicing alternative outcomes” (Vujakovic, 2017, p.471). Suggesting the concept of *future mapping*, he argues that maps can have prefigurative power, especially in geopolitics. Vujakovic writes that during the wars in Yugoslavia in the 1990s, British news organizations often misrepresented the internationally recognized sovereignties in the Balkans:

‘symbolically’ elevat[ing] Serbia to the same status as surrounding sovereign states, while treating Montenegro and Kosovo as if they had the same status *within* Serbia ... The cumulative effect was to create a confused and fragmented political situation or an image of Kosovo as a separate political space (Vujakovic, 2017, p.471).

But this precedent-setting power, he argues, can also affect maps “showing proposed transport routes or locations for new airports” (Vujakovic, 2017, p.471). Legal theoreticians have considered this precedent-setting power of maps as a key concern of constructions of coloniality (Mahmud, 2007); disputes over sovereignty (Rajkovic, 2018; Rajkovic, 2019); struggles for human rights (Leuenberger & Schnell, 2013); and humanitarian aid responses (Johns, 2023).

The precedent-setting power of maps is usually constructed at the level of geopolitics, that is, at the level of the nation-state. While geopolitics is an important arena for these prefigurative powers, I would argue that this arena is also the most contested; urban maps which suggest their ordinariness at the same time that they suggest territory, might more easily “get away with” changing our conception of places and our actions relating to them.

Can we locate this affirmatory and materialization power in a more grounded way? When and where in history have we observed mapping bringing territory into being, and what do those territories look like, both on the map and on the ground? Critical cartographic theory implies that territories should bear the marks of their mapmakers, as maps bear marks of territories. Others have previously identified the ways mapping, and the

dissemination of geographic information more broadly defined, can instantiate and accelerate on-the-ground social and political processes across different domains. Online reviews of local businesses created with geo-located smartphone applications make cities more legible for consumption, inducing wealthier consumers to consume services and experiences in gentrifying neighborhoods, thus accelerating the pace of gentrification (Fields et al., 2020; Payne, 2018). Maps have been used to bring historic-literary narratives of space into being, such as the Camino Real trail in California, now a signposted “historic route” (Welizarowicz, 2022). Cartopolitics claims mapping is a process quite literally of establishing borders, both those of states and quasi-states such as the European Union, contrary to notions that such a process follows from some kind of “separate” legalistic bordering practice (Strandsbjerg, 2012; Bueno Lacy & Van Houtum, 2015; Cobarrubias, 2019).

Smaller changes in the landscape are directly tied to mapping activities. Survey markers, a demonstration of the mapmaker’s work in the world, permeate mapped territories, bearing the names of the mapping projects to which they belong. Border stones and barriers physicalize mapped boundaries, and their movement (by intention or accident) can precipitate if not genuine diplomatic crises than at least media kerfuffle.³ Early aeronautical navigational infrastructure required gigantic concrete arrows to be constructed in the U.S. landscape, so pilots could view the surface of the Earth as if it were a map.⁴ Remote sensing calibration targets are scattered across the country, so we can match our territory with our images of it. A 1.5 km compass, complete with numerical headings, transforms a dry lakebed near Los Angeles into something like a training field for military pilots. So, mapmaking in the first instance requires intervening in the territory.

In all of the examples in this section, territory is not only described by mapping and geo-information but also actively shaped by it. Spatial futures are not only forestalled but also promoted by the interface between geographic representation and grounded reality. And, as the production, circulation, and consumption of geographic information comes to permeate more of our interactions with notions of territory the affordances of these tools cannot help but define a limited range of outcomes on which our attention is focused.

Critical cartographic literature establishes mapping as a tool of empire and nation-state, but relatively fewer authors consider the grounded role of maps at the urban scale. And, where maps are considered at the urban scale, it is their representational and naturalizing powers that are highlighted, rather their inventive power. Yet it stands to reason that wherever these tools of territorial inscription meet regimes of territorial management – urban or otherwise – they are deployed to shape space proactively in certain

³ One such incident took place in Belgium in 2021, when a farmer accidentally moved a border marker near Erquelinnes about two meters into France.

⁴ “EIRE” was marked on Ireland’s coasts to denote that nation’s neutral territory from that of its neighbor-combatant.

ways. I next turn to connecting the map-as-tool to a formal model of how urban governance occurs in U.S. cities, namely through urban governance coalitions. Urban coalitions use various strategies, not only cartography, to organize and *coalesce* around shared goals. But, as I will seek to demonstrate, maps play a fundamental role in allowing urban regimes to propagate a shared spatial frame of reference, in which allocations of resources are explicitly or tacitly agreed upon.

Of Machines and Regimes: The Growth Machine

In the U.S. context, two schools of thought dominate in the study of how cities facilitated development during the 20th century: growth machine theory and urban regime theory (URT). The growth machine theory states that urban governance is manifestation of the interests of a land-owning elite, and governance is structured to serve these interests at the urban scale. Mollenkopf (1975) first described this dynamic in all but name, but Molotch (1976) coined the term and organized the theory under it. Additional elaboration of the growth machine came later, in Molotch (1993), in which he somewhat broadened and formalized the theory in response to criticisms. In Logan & Molotch (1987) the authors produced a more comprehensive monograph which developed the growth machine as a theory of the “political economy of place” premised on the growth machine’s tendency to maximize exchange values of real property over their use values, based on numerous empirical examples from the U.S.

Molotch revisited and evolved his theory over several decades, gathering in the process a small universe of acolytes whose engagements with the theory vary. There have been efforts to explore in detail the diverse agents and channels through which growth machines must act in order to realize shared goals: constructing *regimes of representation*, i.e. discursive frames that depict cities in certain ways (Short, 1999; Collins, 2020); exploring the role of property-oriented development experts in coordinating development (Cox, 2017). Others have argued that its focus on land-owning elites prevents growth machine theory from adequately engaging with the racialized and gendered environments in which they operate and which they tend to reproduce (Gilbert, 1999; Seamster, 2015).

Urban Regime Theory

URT states that urban governance is sustained by informal coalitions of actors whose stability and survival is premised on the mobilizing of resources commensurate to their ambitions. The theory was mainly elaborated by Stone in his influential study of postwar Atlanta, Georgia (1989); in an article distinguishing URT from pluralism and developing a typology of four regimes (1993); and in two retrospective articles reflecting on the theory’s development over time (2005, 2015). Subsequent contributions drew on extensive empirical examples (generally the application of URT to empirical cases is called *urban regime analysis*). International comparative examples from France and the United Kingdom expanded the geographical reach of URT, albeit with regional specificities (Stoker & Mossberger, 1994).

Case studies from North America and Western Europe demonstrated that regime formation was the product of existing structural conditions and cities' specific bargaining contexts vis à vis their regional or national governments (Kantor et al., 1997). More formal theoretical boundaries around the term *urban regime* helped to delineate where and when that label was appropriate (Mossberger & Stoker, 2001). And monograph-length studies incorporated extensive empirical evidence that URT possessed an explanatory power across multiple international governance contexts and metropolitan areas (Savitch & Kantor, 2002).

Intellectual Cousins

Both growth machine theory and URT are premised on the idea that *governance* is a term best understood to transcend *government*, that is, elections and elected officials are only one component of a much more complex machinery for administering and developing cities. Local non-governmental entities, including banks, media outlets, and civic organizations, must also be considered. Additionally, both theories agree that development is often a key priority of U.S. urban governance, although it is not a prerequisite of URT.

The growth machine theory maintains that urban development in the U.S. is a manifestation of the interests of an elite landowning class, who scaffold and collaborate with local institutions – the local newspaper, chambers of commerce and other business consortiums, banks and homebuilders, and so on – in order to promote the investment necessary to increase land values and therefore grow their personal wealth (Molotch, 1976; 1993). These players interact within “nested” structures (Molotch, 1993, p.31) from “shopkeepers” competing “to determine in front of which building the bus stop will be placed” to the scale of the “state development agency, or a regional association” - the scalar focus of these groups is “at least one level higher” than the community of land-promoters, i.e., neighborhoods petition city councils; councils petition counties and states; counties and states petition the Federal Government (Molotch, 1976, p.311).

By contrast, URT revolves not around the *predictability* of elite influence over growth dynamics, but rather around questions of a coalition's *sufficiency* to deliver its agenda. Coalitions can make growth an objective or not, but in any case, it will need to mobilize resources proportionate to its aims in order to survive (Stone, 1993). Stone (2015) later called this the “Iron Law” of regime theory, to which he added the parallel argument that “a stable coalition is needed to provide the necessary resources. By itself government is rarely a sufficient base” (Stone, 2015, p.103). In other words, a coalition's successful endurance depends on marshaling resources toward a shared goal, while at the same time keeping diverse governmental and non-governmental partners in strategic stability.

We can see that these two theories are related in their description of governance as an interplay of governmental and non-governmental elements. However, the two theories do differ from each other in important ways, which I would describe in terms of focus, approach, and assumptions. First, focus: the growth machine focuses on the role of

economic interests seeking to maximize profits; regime theory includes a wider array of actors who may not be profit-seeking themselves, and it does not assume coalitions will always seek maximize land values. Second, explanatory approach: the growth machine explains development as a consequence of the influence of elites over policy and land use; regime theory posits a coalitional approach in which elites must sometimes reach consensus or make concessions to realize a successful compromise. Third, assumptions: the growth machine assumes governance is a means to facilitate growth; regime theory assumes only that successful pursuit of growth-oriented governance will demand coalition-building according to social factors.

Machine vs. Regime in Practice

For my purposes, conceiving of urban regimes in metropolitan California as pure exemplars of Molotch-style “growth machines” is not necessary, although the pursuit of growth was certainly front-of-mind in both empirical examples I will explore. I lay out the theory because, as we will shortly see in the next section, the term “growth machine” has consistently been applied to the postwar Los Angeles context in which one of my empirical examples unfolds. I would even suggest that the theory in the first instance was highly evocative of Los Angeles, making it hard to set aside the theory in a discussion of the same period. Likewise, while I think the narrative of a wealthy, landed elite’s single-minded pursuit of their own ambitions with little regard for negative downstream consequences has some explanatory power in the case of why Los Angeles and California look and function the way they do, I am cautious to adopt a theory which assumes this class is immune from compromise, deal-making, or periodic overthrow.

URT also has a distinct advantage to situating mapping in discussions of governance, namely that it leaves more conceptual room for the role of experts such as cartographers in governance coalitions. This technique allows an accounting for the ways that available expertise structures coalitions’ approach to problem-solving. Stone (1993) considered the role of expertise as a type of *resource* available to coalitions, that is, that coalitions mobilize expertise along with other resources (he cites skill, ability to inspire, and organizational capacity as other specific examples of non-material resources) (Stone, 1993, p.11). I would suggest adding to this conceptualization the detail that the type of expertise available, the technical skills they possess, and their political credibility has much to do with whether and how experts are mobilized in the first place, and to what ends. Stone formulates this in a more general way in a discussion of the role of material resources, but I think it applies to technical resources too:

the ready availability of means rather than the will of dominant actors may explain what is pursued and why ... if some goals are more readily achieved than others, then people will tend toward those goals that are achievable. This may be the case even when hard-to-achieve goals are deemed desirable (Stone, 1993, p.12).

Stone is saying two things here. The first is that the resources available to a coalition play a role in deciding which issues to address. If technical expertise is a resource, then we could interpret Stone's perspective along the same lines as the adage from the beginning of this chapter, *when all you have is a hammer, everything looks like a nail*. The second point Stone is making is that the desirability of a goal cannot be disentangled from its perceived achievability – achieving goals is desirable, and therefore desirable goals are achievable ones. We can apply this general perspective to the “resource” of technical expertise. Technical experts help to form coalition opinions about what is achievable, and therefore according to Stone, what is desirable. This is precisely where cartography interfaces with governance, because maps increase the perceived achievability of some projects over others.

Regimes Need Maps

As we have previously seen, cartography is understood to possess the power to propose, to naturalize, and to imagine territories. And we have just explored the idea that having the means to achieve a coalitional goal is sometimes more important than the will of the actors involved. My central argument, which I introduced at the beginning of this thesis, connects these two ideas: maps and mapping, through their propositional, naturalizing, and imaginative modes, offer coalitions the allure of achievability of given territorial goals (such as highway building or metro construction), which contributes to those ideas' desirability within that coalition. If an idea can be mapped it seems more achievable. If it seems achievable, it becomes desirable. If it is desirable, then it is more likely to be a coalitional priority, and resources are more likely to be mobilized toward its realization, creating a positively reinforcing cycle.⁵ Grounded as they are in solving problems in urban environments, U.S. development coalitions attain sufficiency insofar as they are able to establish and respond to a collective mapped image of a given set of issues.

In this way, cartographic expertise is a kind of “fundamental expertise” to urban coalitions in a similar way as it is to nation-states and colonial empires, not only to create territories but also to produce territorial ideas and facilitate their prioritization in governance. At the urban scale, mapping allows coalition partners to speak in a shared system of coordinates, addresses, parcel numbers, and other geo-data, upon which “higher order” forms of spatial work depend. These in turn underpin and naturalize the administrative division and management of cities into districts, neighborhoods, zones, and so on. Only after coalitions have established a shared spatial cartographic universe can they act in and on it. And, as long as they operate within the shared spatial framework maps propose, coalition partners can place some degree of faith that the basics of development are

⁵ The reverse might also be true: unmappable ideas seem less achievable and therefore less desirable.

feasible: land transactions (buy, sell, loan), improvements (buildings, based on plans, based on surveys, based on maps), and shared infrastructure (roads from somewhere to somewhere else, power lines, etc.).⁶

Doing Development with Maps

Earlier in this chapter, I discussed how the imaginative power of maps has been found to contribute to the production of territories at the national and imperial scales. At the urban scale, studies of how maps *reflect* or *represent* development are relatively common (for example, see Olson, 2018, on Paris; Neuwirth & Robbins, 2009, on New York; and Creason, 2010, on Los Angeles). But considerations of the power of maps in the imaginative mode at the urban scale are less frequent.

Lee (2019), who writes from the perspective of historical material culture and urban history, argues in the case of Paris's development that planning maps complimented an emerging preoccupation with documents and paperwork among Paris's administration in the 19th century, helping to structure and organize bureaucratic goal setting and decision-making. Although she does not mobilize urban regime theory, she describes Paris's administration in terms of *governance* and as a group of agents whose collective vision is held together by a shared plan (Lee, 2019). She describes the way written administrative decisions and observations referred to plans and maps "only seemed to cement their representational status" through mutual affirmation. "The plan, then," she writes, "is the only means of linking the varying interests—including those of state officials, the engineers, architects, and property owners—and for them to communicate by sharing a reference" (Lee, 2019, p.263). Lee's (2024) monograph-length study of mapping in the history of Parisian development has very recently been published; however, at time of writing I have not yet been able to access a copy.

Others have identified a more specific relationship between growth coalitions and the power of maps to materialize urban territories, namely Rosen & Alvarez León (2022, 2023) and in a recently published book in Alvarez León (2024). However, these recent works focus on what these authors argue are the distinctive qualities of new "digital" aspects of spatial representational power, conceptualizing from this the idea of the *digital growth machine*. I will briefly touch upon this formulation in order to unpack its central claims, and then to suggest that the relationship need not be understood to exist strictly in the present "digital age" but also historically as a more generalizable feature of growth coalitions.

Rosen & Alvarez León (2022) conceptualized the *digital growth machine* around the idea that digital technology allows elite alliances to further extend their influence over urban

⁶ In the U.K., the Royal Institution for Chartered Surveyors organizes not only professional surveyors but also property valuation and sales professionals.

land intensification, while also developing “new possibilities” for land-based profit (Rosen & Alvarez León, 2022, p.2248). The digital growth machine, they argue, does not only augment urban growth but fundamentally transforms it; for example, by extending spaces in which elite groups dominate into the digital domain through phenomena such as platform urbanism (Uber, Airbnb, etc.). These mark the shift of traditional market activity into the digital domain, as well as the development of new types of transactions. Further, there is an increasing dominance over urban space of IT-industry firms which largely do not depend on the intensification land to increase profits. Finally, the increasing importance of what the authors term “renderings” means that urban life is increasingly experienced and reproduced through digital tools. Renderings are not images of the city in the strict representational sense; rather, they incorporate under this term a wider variety of digital tools that mediate our interaction with and interpretation of the city (analytics dashboards, digital maps, real-time mobility tools, etc.). Rosen & Alvarez León connect this dynamic to the materialization power of the map: “In another case of the map becoming the territory,” they argue, a prominent position in this digital space can translate to real-world acclaim, whereas digital erasure increasingly corresponds to genuine irrelevance (Rosen & Alvarez León, 2022, p.2259).

This argument is somewhat built on the argument developed in Alvarez León (2016), which explores how a shift from paper maps to digital maps is emblematic of the transformation of *property regimes* (i.e., regimes of rules, regulations, and roles that define & distribute rights to and responsibilities over property) by the advent of digital spatial information. Leveraging the example of Google Street View, Alvarez León argues that new property regimes, especially surrounding the issue of individual privacy, have emerged as Street View has commodified new forms of spatial information. Alvarez León (2024) extends this argument to a theory of digital capitalism in which digital spatial technologies “do more than simply provide geographic information in digital form; rather, they transform space and spatial relations in the process, leading to new and different economic and political formations, such as those that characterize digital capitalism” (Alvarez León, 2024, p.19).

While Rosen & Alvarez León privilege the digital in their reading of how growth machines, and their “renderings,” transform and respond to the city, others, such as Willmott (2020) have questioned the categorical difference between the digital and what came before it. What has been termed the “digital” with regard to the representational power of maps, Willmott argues, is only “the most recent iteration of this phenomenon – the computational technologies and logics that have evolved from this history but seem to sit without past in our everyday semantics” (Willmott, 2020, p. 170). But, asks Willmott, is it not better to connect the digital as we understand it today to the deeper Enlightenment roots of numerical and textual rationality? If digital and mobile maps have developed a privileged representational power, it is due to their strengths from *within* a longstanding “mode of

cartographic reason,” not from *without* it, she implies. Therefore, we should not fall into the trap of flattening paper maps in order to accentuate the digital – after all, they *do*, in fact, “do more than simply provide geographic information” in paper form. Others (Eisenstein, 1980; Woodward, 2007) have traced in great detail the manifold technological innovations necessary to print and circulate maps, and these technologies, too, seem worthy of investigation.

The implications for this thesis are that there may be less of a distinction between the representational, naturalizing, and imaginative power of digital maps compared to paper ones than subjects writing from within the “digital age” might first assume. And, while “digital growth machines” may indeed exploit digital spatial information to transform territory in new ways, so too were prior regimes leveraging the spatial information available to them, in new ways and often toward similar ends. Nonetheless, Rosen & Alvarez León demonstrate that spatial information does not only reflect development in a disembodied or impartial way; rather, it is the production and circulation of spatial information that helps to animate coalitions’ actions.

Chapter 3: Methodology

Background

As stated in Chapter 1, my primary research question is that of how maps and mapping have been used by governance coalitions to imagine and gain political approval for their spatial goals at the urban scale. Under this question I posed several sub-questions. First, who are the members of such coalitions and what are their spatial goals? Second, how do these coalitions use maps and mapping to reach these goals? Third, what technical and aesthetic approaches characterize such mapping efforts? And fourth, how do these reflect the politics of mapping? With these questions in mind, I will now turn to a discussion of my approach to answering them, describing why I selected this particular theoretical and methodological approach.

In order to answer my research questions, it is necessary to employ an approach that can account for the longer-term effects of spatial decisions made in the past. The futures depicted on maps are contingent, until they aren't: a longer-term view is therefore essential because large projects take significant time to implement. Without substantial perspective on events subsequent to the production and circulation of maps depicting the future (such as it was at the time the map was produced), it would be impossible to analyze what if any role maps played in the outcomes of such projects. Thus, this thesis takes an historical perspective to examine the roles maps and mapmaking have played in urban development over long periods of time.

To accomplish this analysis, I have adopted two primary methods of historical geography, namely archival research and historical cartography. My archival research consisted of reviewing primary-source documents, including maps but also contemporaneous state publications, urban plans, electoral documentation, and administrative documents recording official decisions and deliberations. Historical cartography comprises the comparative examination of historical maps and mapping efforts to unpack the changes in cartographic techniques and approaches over time. Here I have examined maps unearthed as part of my archival research through a more technical and graphical lens to interpret their content and intent. To contextualize the sources examined with these methods, I also drew on a variety of secondary historical sources. Through cases built on this evidence, I will unpack in the following two chapters the mapping activities of key institutions and actors who sought to develop two different systems of transportation infrastructure in California.

My first two sub-questions, examining coalitional goals and the political usage of maps to achieve those goals, first require a theoretical structure that can connect concepts of urban politics and to the politics of mapping. I have developed this framework in the preceding chapter: in the U.S. context, urban regime theory provides a flexible and established framework to analyze the actors responsible for urban governance. Critical

cartographic theory provides the foundation of a discussion of the political power of maps. In order to connect these two literatures, I developed a link between the literatures through the concept of *expertise*, that is, I suggested that the ability to make and publicize maps is a form of expertise that urban coalitions draw upon to organize coalition partners around a given project.

To approach the remaining sub-questions, i.e., examining the technical and aesthetic approaches to making maps, and interpreting how these may reflect the politics of mapping, a close examination of the map object itself is required. This is for two primary reasons. First, one cannot claim that a map has a political aim without first establishing some interpretation of what that political aim is. Second, map objects are graphical as well as textual; therefore, interpreting the political aim of a given map requires unpacking the technical and aesthetic dimensions of the map's content. I will revisit this latter point in more detail later in this chapter informed by the concept of a "graphical grammar."

From Theory to Analysis

Although this thesis focuses on transportation cartography, this is not a thesis "about" roads, freeways, or metro systems. It is about how places change and how maps contribute to these changes. However, discussing transportation cartography does provide an ideal entrée to a discussion of the politics of mapping, because the development of infrastructure 1. requires significant mapping efforts and 2. the decision of where to build infrastructure is often a contentious debate settled through politics. Additionally, transportation projects tend to generate significant non-map administrative documents, news stories, and secondary historical accounts, making the source material particularly rich.

My theoretical departure point is the established critical cartographic view that maps are not inert representations of space, but rather tend to reflect and reinforce political and social aims. This conception points to the ways mapmaking has power over the ways the world is represented, naturalized, and materialized – consequently, how the world is shaped by mapping. Previous work on this topic has focused on the role of how mapping shapes notions of empire or nation-state. And, for critical cartographic work at the urban scale, often the representational and naturalizing powers of maps are highlighted over their inventive power. But I suggest that maps and mapping have powerful effects not only on how we organize and understand territory today, but on what is envisioned and built into the future.

How is "map power" enacted in cities? I mobilize urban regime theory as a general framework for how cities develop and change over time. I connect the power that maps apparently have to the power that urban regimes apparently need in order not only to *realize*, but also to *set*, their goals. I argue that through mapping, ambitious spatial goals are made to seem more achievable in an urban context. Projects which have the allure of

achievability are more likely to become desirable coalitional priorities, creating a positively reinforcing cyclical allocation of resources toward such projects. Thus, mapping becomes an agential tool for re-shaping the city – what can be mapped, can be built.

To accomplish this analysis, I have examined both maps and the institutions and people who created them, with attention to the historical context of their creation, in order to make a dual argument both about *how the map shows the world to be*, and how the *map acts on the world*. I focus on the production and circulation of maps, rather than their consumption by end users, for methodological reasons, namely the challenge that would be posed by an investigation of thousands of individual historical experiences and re-interpreting firsthand experiences. I additionally undertake a visual interpretation of the content of my case-study maps to unpack what information can be gleaned from the page, mainly the intended audience and usage of the map; but also, the worldview the map deploys, i.e., how the map “makes us see” the territory it depicts. This approach entails drawing on theories of information graphics and cartography such as those of Krygier & Wood (2011) and Munzner (2014) to interpret the lines and colors on the physical page according to a structured “graphical grammar.”

Overall, this approach is productive because it grounds the critical cartographic argument that maps “do work” on the world in a model of how governance occurs in U.S. cities, helping to explain in concrete terms how mapping affects the world. The representational, naturalizing, and inventive powers that maps have can often appear abstract in critical cartographic literature, as if maps can act in the world *only* through their effects on imaginaries or the impressions we have of a place. Maps certainly do affect these in powerful ways. But I aim to push this idea a little farther, placing the maps in my case studies at the center of two moments of political decision-making as a key tool for organizing different actors around shared ideas about how to allocate resources in a given territory. I show that maps are a tool to enact political compromise, organize political support, envision future projects, and redirect resources toward certain interventions in space.

And, from the perspective of theories of urban governance, I also attempt to illustrate that much of the “work” of urban development coalitions is “done” long before roads are ever paved, or buildings built. The cartographic fundamentals preceding the development of physical structures have strong path dependencies – and the decisions made by the mapmaker have long lives. So, while a subsequent coalition may wish to reallocate resources to new or different priorities, they will find that their range of outcomes well into the future is constrained and guided by maps made by prior coalitions, even those in the politically distant past. Even regimes that are more liberal in terms of land use policy (take the canonical example of Houston) are still highly reliant on historical maps and mapping projects to guide their development. Lots are still platted and titled, roads are still

planned and built, and public services are still delivered according to longstanding cartographic conventions and structures.

The L.A. Rail Coalition & the California Roadbuilding Regime

Before turning to the specific role of maps and mapping in coalitional governance, I will describe the two governance coalitions on which I will focus. I present them in the order that they are discussed in this thesis.

The first coalition, which I will call the Rail Coalition, worked to establish its influence at the governmental level of the County of Los Angeles beginning in the 1970s until about 1990. As I will shortly discuss, it advocated for a specific policy, a regional system of rail rapid transit, from within the context of longstanding growth-oriented politics in the region – a broader and deeply rooted growth coalition. The second coalition, which I refer to as the Roadbuilding Regime, united various actors at the state level to affect change at the urban and suburban scale during the early 1910s through 1940.

The Rail Coalition drew support from a variety of actors, namely Downtown Los Angeles business interests, labor unions, construction-industry firms, a burgeoning environmental movement, and elected officials (Elkind, 2014). The interests these actors had in rapid transit varied: Los Angeles business interests aimed to preserve their district's role as the traditional financial and administrative center of the county as postwar sprawl threatened their primacy; rapid transit would presumably center on Downtown, juicing demand for office and retail space. Labor unions and construction-industry firms surmised that a major county-wide construction program would benefit their members (Whitt, 1982). The nascent environmental movement identified rail as a preferable alternative to the smog and gridlock that was synonymous with Los Angeles's car-dominated freeway system. Elected officials across the county had diverse reasons for supporting rapid transit: some represented poorer districts where rapid transit would greatly benefit their constituents; others were longtime rail boosters (Elkind, 2014; Luberoff, 2016). The potential voting base for this coalition was similarly broad: it would likely many existing bus users, of whom there were hundreds of thousands; frustrated commuters; and no doubt to a lesser extent, those who still remembered Los Angeles' defunct urban and interurban rail systems fondly (Elkind, 2014).

Political power over rapid transit investments in Los Angeles at this time was vested in the eleven-member Los Angeles County Transportation Commission (LACTC), created in 1976 to coordinate regional transportation development, including rapid transit but also some freeways. The Commission's eleven seats were divided among five Los Angeles County-level district supervisors; the mayor of the City of Los Angeles (or an appointed alternate); one city councilor from the City of Los Angeles and one citizen-representative, both appointed by the L.A. Mayor; one member of the council of the city of Long Beach; and

two council members from other municipalities (Premo, 1977; LACMTA, 2011). The Commission's capital budget was relatively small, and any capital spending was limited to what could be raised by individual half-cent sales tax measures, approved by referendum and levied countywide.

Who occupied the post of mayor of Los Angeles was of critical importance to the LACTC, as he or she would appoint more than a quarter of votes. The Rail Coalition therefore gained a major ally from 1973, when Tom Bradley won the Los Angeles mayoral election on a platform which included the construction of rapid transit. Kenneth Hahn and Baxter Ward, both the county supervisors in these years, were also supporters of rail, bringing members sympathetic to the Rail Coalition to a total of five out of eleven votes. A minimum of six votes would be needed to authorize a ballot referendum; the remaining representatives (including "Pistol Pete" Schabarum, a Reaganite Republican) hailed from county districts and municipalities where support for rail investments was lower. Additionally, even members sympathetic to the Rail Coalition might not support every rail plan in every case (Elkind, 2014). The fate of transit in Los Angeles was vested in this Commission, but it was not by any means guaranteed.

The Rail Coalition therefore counted powerful interests among its members, but its ability to mobilize resources towards rapid transit was somewhat restricted by its institutional design and the political views of its members. The compromises necessary to marshal support for rapid transit would require convincing, a project in which maps would prove politically useful. The Coalition was also aiming to establish influence in something of a multipolar environment in which broad public support for rapid transit was hardly a foregone conclusion. I will next discuss some of the broader dynamics of growth politics in Los Angeles in order to unpack this political setting.

Growth Politics in Los Angeles

Scholars have repeatedly used the term "growth machine" with regard to Los Angeles, both to refer to the pre-war "overzoning" of the City, and more generally in the postwar period to the rapid expansion over local objections of the urban landscape into the San Fernando Valley (Fulton, 2001; Whittemore, 2012). Molotch, who coined the term "growth machine," wrote his original (1976) paper as a resident of Santa Barbara, i.e. while living in the northernmost city of the highly urbanized Southern California region centered on Los Angeles. He did so during a period in the 1970s when concerns around the environmental and social effects of Los Angeles's development were unequivocally front of mind. Much of the 1976 paper uses Los Angeles as a case-in-point or places other cities in contrast to the assumed growth machine of Los Angeles. For example: Molotch's evidence for the illusory promise of growth comes from Californian cities with Los Angeles prominently featured (Molotch, 1976).

L.A.'s main newspaper, the *Los Angeles Times* is exemplary for Molotch of a growth-machine media collaborator: the "*Times* editorializes against narrow-minded profiteering at the expense of the environment but has also favored the development of the supersonic transport because of the 'jobs' it would lure to Southern California," Molotch writes (Molotch, 1976, p.316). In contrast to the *Times*' bullish position on growth, Molotch notes in contrast that a study of Santa Barbara "demonstrated that additional population growth would require higher property taxes, as well as higher utility costs" (Molotch, 1976, p.318).⁷ I do not think that applying the growth machine moniker to Los Angeles as distinct from an URT-style development regime has a particular conceptual advantage over the more flexible application of "development regime" or "growth coalition." However, I maintain that is an important to understand that the region's approach to development is practically synonymous with the term.

Who were the main players in this more broadly defined pro-growth regime? William Fulton (2001) traces its essential agents. Los Angeles underwent explosive economic and population growth during and after World War II, owing to the region's important role as a strategic center of industrial manufacturing. Successive governors of the State of California undergirded the region's development with public investment in major infrastructure projects in the late 1940s and early 1950s, including railways and port improvements. The delivery of new housing accelerated as the techniques of mass production were applied to the domestic architecture of Southern California. Local banks underwrote development. The local papers, namely the *Los Angeles Times*, sang the region's praises and supported development (Fulton, 2001).

The names of these actors and the institutions they built are still familiar to many Angelenos: Eli Broad (founder of Kauffman and Broad Homes, one of the largest suburban housing developers in the U.S.); Mark Taper (Biltmore Homes, American Savings and Loan) and Howard Ahmanson (Home Savings of America), pioneers of the savings & loan mortgage model which underwrote those houses; and Norman Chandler, who took over publication of the *L.A. Times* in 1944, whose tenure was marked by a conservative and pro-growth perspective. These people and the institutions left their mark on the region – a mark that is easier to see in some places than others. Two blocks of Grand Ave. on Bunker Hill in

⁷ Overall? Per capita? Normalized for quality/quantity of public services? Molotch doesn't say. He also does not disclose that he was a lead author on this report (entitled the Population Impact Study), which was conducted by the Santa Barbara Planning Task Force, of which he was also member appointed by the local city council. In a pamphlet comprising the "Issues Booklet for the Population Impact Study" distributed by the Task Force in cooperation with the local newspaper, the Santa Barbara News-Press, entitled "Santa Barbara: How Many People Should There Be," various arguments geared toward the existing, prosperous, homeownership voter base are leveled at the prospect of local growth: growth will not make you wealthier, growth will increase your property taxes, growth will make the city less aesthetically appealing (Santa Barbara Planning Task Force, 1974).

Downtown Los Angeles are home to the following major arts institutions in north-to-south order: the Mark Taper Forum, the Dorothy Chandler Pavilion (named for Norman Chandler's wife), the Howard Ahmanson Theatre, all at the L.A. Music Center; and The Broad, a major contemporary art museum, named for Eli and Edythe Broad. Disney Hall is in between.⁸

The potential for rapid transit to undergird the broader growth aims of Los Angeles elites and the coalitions they cultivated was an important consideration of growth coalition members, even as some specific institutions (namely the *L.A. Times* under Norman Chandler) failed to support the specific transit referendum I have examined in this thesis (Elkind, 2014). Downtown business interests had made large financial contributions to previous transit referenda campaigns in 1968 and 1974, although these had not passed (Whitt, 1982). The Los Angeles Chamber of Commerce, representing an even broader selection of the city's business interests, had also supported these referenda, directly implicating the construction of rapid transit in achieving "growth" and avoiding "stagnation" (Richmond, 2005, p. 169).

If we accept the presence of the growth coalition in Los Angeles in the postwar period, we can also say that it largely ceased to function by the early 1990s. Whittemore (2012) writes that two reforms, one a state-level zoning reform implemented over the course of the 1980s, and the other a 1986 city referendum on allowable floor-area-ratios, "spelled the fall of the growth machine in the city" (Whittemore, 2012, p.126). Fulton (2001), who argued at the turn of the century that "For the last hundred years, Los Angeles has been one of the most effective growth machines ever created," contended that the passage of Proposition 13 in 1978, a measure to freeze property taxes, set in motion the "collapse" of the growth machine as revenues began to lag the expenses of keeping up the infrastructure of a region "so large that it now encompassed several different climates" and "now home to fifteen million people" (Fulton, 2001, p.7, p.12). Purcell (2002) argued the growth machine hadn't "collapsed," but rather that the political consensus supporting growth policies had instead "eroded" over a period of about 15 years. Nonetheless, in these cases the 1980s is identified as a key turning point when the status quo of growth consensus changed. Others have continued to apply the term to Los Angeles, albeit in much more localized ways that highlight the lack of a regional-scale growth consensus along the lines of the four postwar decades (Lin, 2019; Collins, 2020).

The Roadbuilding Regime

⁸ I spent much of my childhood at the Mark Taper Forum, where my mother was employed for 28 years.

The second coalition is more distant from our own time and more diffuse in space, but I suggest no less potent than the Los Angeles example in terms of its influence on the urban character of California. This coalition, active beginning in about 1910, was centered on the politically appointed California Highway Commission (CHC) and supported by a variety of actors who I will shortly describe in more detail: oil companies, automobile clubs, financiers, public elected officials, contractors, and lumber and concrete producers (Pincetl, 1999, p.148-152). As I stated in Chapter 1, in this sense the coalition was an “urban” one, because the interests it served were primarily urban interests. In turn these actors in turn relied on the democratic support of a California voters and the coercive power of the state (in matters of property acquisition and convict labor in particular) in order to realize an ambitious project of road construction connecting California’s largest cities to each other, and to their hinterlands (Pincetl, 1999; Roth, 2007).

I call this California’s Roadbuilding Regime, but I am not the first person to use the phrase. Pincetl (1999) used the term “growth machine” to describe statewide roadbuilding efforts. Roth (2007) coined the term in a doctoral thesis in order to describe the Progressive-era roadbuilding consensus at the scale of Los Angeles during the interwar period:

Completed projects were the means by which the city engineers extended their power and promulgated their ideas. The process of building streets and highways in Los Angeles produced the structure of public authority under which more highways would be built -- the roadbuilding regime” (Roth, 2007, pp.18-19).

However, I use the term to describe a process unfolding in, between, and beyond California’s cities. This is for straightforward reasons: I think that roadbuilding is usefully understood as an urban-oriented process even when occurring beyond the urban scale, and a large part of the political case for roadbuilding in California was as a method of displacing railroad monopolies for intercity transportation, not only for urban transport (Roth, 2007). In this thesis, I employ the term to refer to the actors united in coalition to realize California’s state highways.

At the center of roadbuilding was the CHC. The composition of this powerful state-level Commission illustrates how the major economic interests of California were well-represented by the Commission’s three inaugural political appointees, Charles Blaney, Burton A. Towne, and Newell D. Darlington.

Blaney, the Chairman, was a Progressive Republican and campaigner for California’s 23rd Governor Hiram Johnson. He hailed from a Chicago real estate background, owned a large estate in Santa Clara County, and was a real estate investor who founded the Saratoga State Bank (Find A Grave, n.d.; Jordan, 1911, p.459). Towne was a roadbuilding booster, the longtime director and one-time president of the California State Automobile Association (Lodi News-Sentinel, 1938). He was also a wine producer (Lodi News-Sentinel, 1938). Finally, there was Darlington, who trained as civil engineer and resided in Los Angeles,

where he also served on that city's Board of Public Utilities and the advisory board of the L.A. Department of Engineering (California Secretary of State, 1911, p.459).

Beyond the Commission, the coalition included the two major automobile associations of California, namely the Automobile Club of Southern California and the northern California State Automobile Association, who claimed a combined membership of 71,000 in 1921 and campaigned in favor of the 1910 bond issue and numerous other county and state-level bond measures for road improvement; they were also by this time the leading automobile insurance providers in California (Automobile Club of Southern California & California State Automobile Association, 1921).

To this support could be added California's major petroleum producers, who were transparent about their industry's dual interest in highway construction, both as a provider of construction materials and consumables. In a 1947 interview, an executive of the Los Angeles-based Western Oil and Gas Association put it plainly:

[T]he oil industry has always been among the most earnest advocates of good highways. Our interest is twofold; first, because it is the duty of good citizenship, secondly, we have a selfish interest in wanting good highways because we sell the materials from which highways are built and the gasoline and oil consumed on them (California State University Northridge Special Collections & Archives, 2019).

Other interested parties included tire manufacturers, of which the largest in California was B.F. Goodrich in Los Angeles. Goodrich promoted automobility in general and tourism in particular by publishing its own detailed route maps of California (B.F. Goodrich, 1915). To this list Sabin (2004) adds "middle- and upper-class recreationalists, intercity commercial carriers, and farmers ... highway contractors, automobile manufacturers ... and highway department officials" (Sabin, 2004, p.165).

It is illustrative that the first three Commissioners represent virtually all the salient political interests of California's roadbuilding regime I have just discussed. Blaney represented banking and real estate; Towne represented automobile interests and, to a lesser extent, agriculture; and Darlington, an engineer, represented the interests of contractors and professionals. The composition of the Commission would change over time; however, the interests it represented would remain largely the same.

I described in Chapter 1 the reasons for conceiving of what has been called the California Roadbuilding Regime as an urban governance coalition; now it is perhaps clearer that this coalition bears many of the hallmarks of more typical examples. These informal and formal networks of governmental and non-governmental actors mobilized significant resources to accomplish their political goals, just as an archetypal governance coalition would. Additionally, we can see that this coalition undertook its activities mainly to serve urban interests; this too, provides a productive reason to consider it as an urban governance coalition.

Locating a definitive end-date for the roadbuilding regime is something of a folly, because roadbuilding continues to consume vast resources in California as in many other U.S. States.⁹ Fulton (2001) argued that the failure of gas-tax revenue to keep up with costs and the onset of increased environmental regulations during the 1970s and 1980s contributed to the demise of Caltrans' freeway-building spree. For the purposes of this paper, I will draw my analysis to a conclusion around the year 1940, which coincides with two important developments. The first is the opening of the Arroyo Seco Parkway, California's first urban freeway, which signaled the beginning of a "freeway age" in which the roads being constructed were qualitatively different from those of the prewar period. The second is the onset of World War II, during which roadbuilding in California took a back seat to other wartime priorities.

Sources & Process

The principal data of my empirical cases was drawn from the archives held by the Los Angeles Public Library and the Los Angeles County Metropolitan Transportation Authority (commonly referred to as Metro) in the summer and autumn of 2023. In the process of selecting my empirical cases, I examined a wide variety of maps and administrative documents from transportation and land use projects across the 19th, 20th, and 21st centuries.

As I mentioned earlier, maps of transportation projects provided an intuitive entrée into discussing the politics of mapping, because large transportation projects are generally planned meticulously; spatially extensive; and produce an enormous administrative paper trail to inform interpretations of map objects. Among the several hundred maps I considered including in this project were maps of the Pacific Electric interurban railway system; a full collection of Thomas Guide street atlases; maps made for the 1984 Olympic Games held in L.A.; plans for the L.A. freeway system; and maps of the Los Angeles Railway and the Pacific Electric Railway, two former systems of urban and interurban rail.

The field of critical cartography helped inform my archival approach. From critical cartographic literature, I recognized the shortcomings of a method preoccupied solely with the map object, absent a discussion of its historical context and creation. However, map collections almost by definition tend to reflect something of this object-focused view of maps – physical archives are organized into drawers and maps are usually treated separately from books and other texts. They are categorized by metadata relating mainly to the physical areas and geographical features shown on the map, and then by publication year and publisher. A typical drawer might have only a few words of context: "Downtown Los Angeles. 1920s. Road maps."

⁹ California had a balance of more than \$20 billion set aside for roads and highways in its most recent fiscal report (Caltrans, 2023).

The paucity of contextual information in such archival sources cautions against an over-reliance on the map object. Without the historical background of the maps' creation and circulation in the real world, it becomes extremely difficult if not impossible to make an argument about the effects of mapped images *on the world*.

At the same time, much of critical cartographic literature elides discussions of *how* maps act in the world. I therefore surveyed more general theories of how change or development *occurs* in the real world might help to explain what exactly *is being done* when maps "do work" – which actors are involved, how they realize their interests, how they collaborate despite differences. I considered growth machine theory, which has been applied to Los Angeles for decades; however, urban regime theory offers a more perceptive and flexible explanation for how development occurs. URT states that urban regimes "do development" by forming coalitions of governmental and non-governmental actors. These coalitions are stabilized by dynamic, informal relationships between public officials, nonprofits, electoral constituencies, technical experts, and other actors. Coalitions tend to survive if they succeed in mobilizing resources commensurate to their shared goals. After this reading, I hypothesized that mapping might play an important role in coalitional goal-setting, and I set out to determine whether illustrative cases existed.

I selected maps whose circulation in the world was well-established, and whose historical moment had been previously considered from other angles. I read widely in the literatures of Los Angeles and California transportation history examined several "episodes" in the state's history where maps were at the center of a political debate or discourse. The two empirical examples I ultimately chose, a map of a proposed metro system for Los Angeles County and maps of the development of California's system of statewide roads, best reflected my research aims. There were undoubtedly other promising sources I might have used; ultimately, my decision to focus on these two examples was down to the richness of source material for these episodes (and the infinite downsides of indecision). In an effort to make my analysis more generalizable, I have intentionally selected maps produced by different actors, depicting different systems, at different spatial scales, and in different time periods.

The first map, a diagram of a proposed metro system for Los Angeles County, is known to have circulated extensively as part of a political campaign for a bond measure supporting the development of the system it depicted. The second set of maps, part of the State of California's efforts to build "good roads" between 1910 and 1940, were widely circulated among a politically influential audience in a state-backed publication distributed across California, the United States, and internationally. In the first case, I was able to use minutes from official meetings in which influential actors directly discuss the use of the map in a referendum campaign in order to demonstrate the salience of the map and its circulation to the goal of an urban regime to realize that system. In the second case I employ

the maps' circulation to influential elites in the *California Highway Bulletin*, the political messages contained in the “peri-map” – that is, the textual and graphic information surrounding the “map frame” – and the textual content of the rest of the publication to argue the political salience of these maps to the evolving efforts of the Roadbuilding Regime.

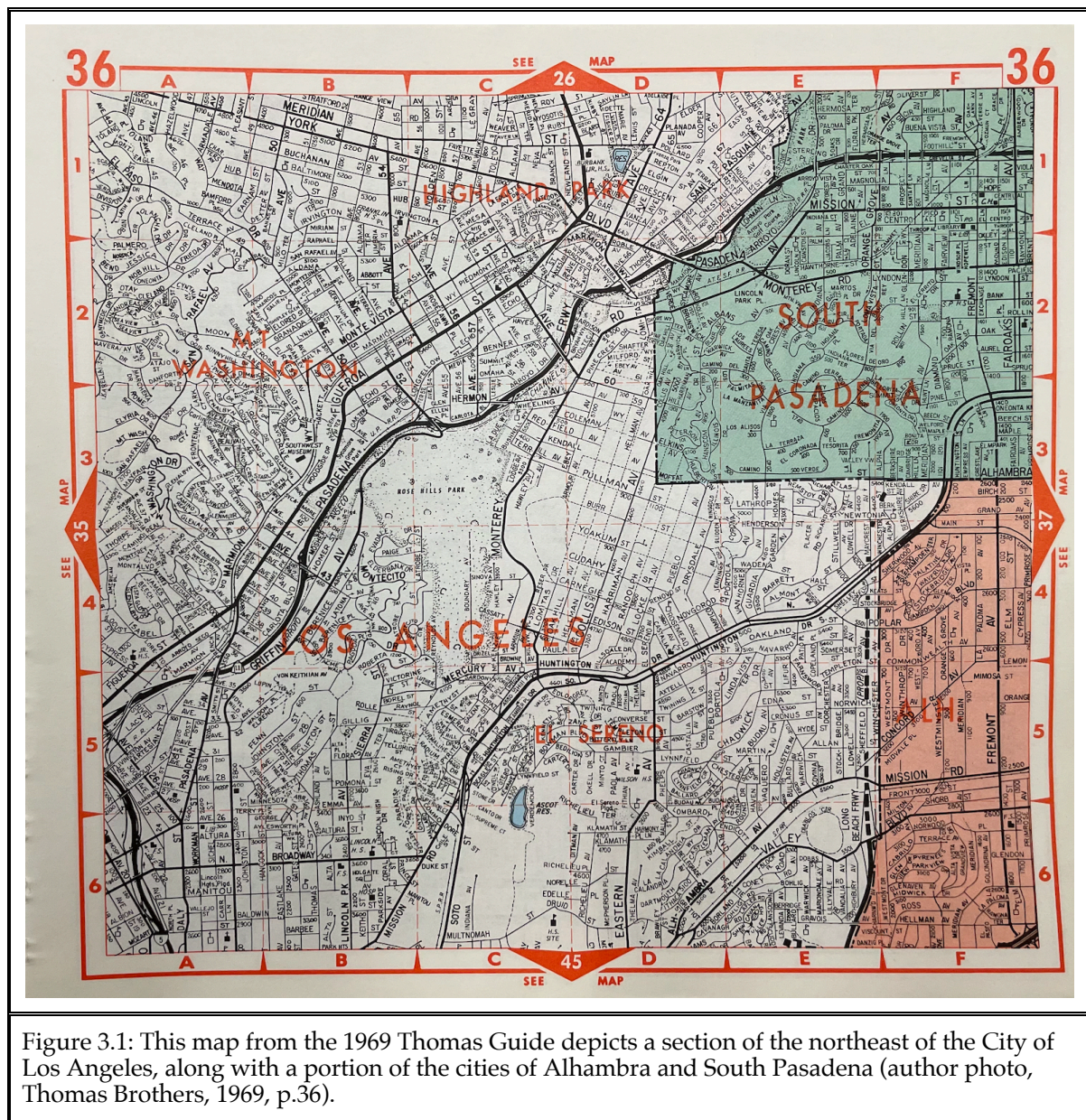


Figure 3.1: This map from the 1969 Thomas Guide depicts a section of the northeast of the City of Los Angeles, along with a portion of the cities of Alhambra and South Pasadena (author photo, Thomas Brothers, 1969, p.36).

Graphic Grammar & Interpreting Maps

Mapmakers must consider a variety of factors when making maps, answering questions from the very general (Who is the intended audience? What physical area or geographical feature is shown?) to the extremely specific (Which typeface is clearest on a shaded-relief background? Which combination of colors is accessible to the widest audience, including the color-blind?) (Krygier & Wood, 2011). These decisions are anything but “natural” – they rely

on a learned corpus of aesthetic conventions that centuries of cartographic traditions have established. Each one is an interpretive choice that can be interrogated for its aims and effects. In the design of visual information, the conventions associated with such considerations constitute a “grammar” analogous to the grammar of a language, although this term is not universally used (Munzner, 2014). Graphists (of which mapmakers are a type) employ “marks” (geometric elements) and “channels” (the visual appearance of marks) to represent geographic areas and features (Munzner, 2014). To greatly simplify, marks may be points, lines, or areas; channels may be size, color, or shape (Munzner, 2014). Text, too, may be considered a mark, while its size, color, and other attributes may be considered a channel.

For example, the 1969 Thomas Guide map depicted in Figure 3.1, part of the popular 20th-century street atlas series of Los Angeles, uses black lines to show all kinds of roads. The line is the “mark” while the size (weight) of the line is the active “channel.” (color is also a channel, but in this example all roads are the same color). The mapmaker used heavier weights for roads that are wider in physical space, i.e. roads that have higher automobile traffic capacity. The thickest lines are freeways, stretching across the map and transcending the individual page, indicating their spatial expanse over great distances. Important arterial roads have a middle thickness, while local streets are thinnest. Therefore, the weight of any individual line corresponds with the road’s relative importance in navigating the city *from the perspective of a car driver*. The map does not tell us about bus routes, pedestrian infrastructure, or regional train service. By interpreting the map through this grammar, we can make an argument about who the map is for, what its intended purpose is, and what kind of world the map “imagines.” In other words, we begin to answer the question, what is the bias or angle the map’s view takes on the world? The Thomas Guide map is intended for drivers, its purpose is navigating a system of roads, and it imagines a world in which this system of roads provides automobility across a large territory.

Limitations

One limitation of my approach is that any historically interpretive process is necessarily subjective. Maps present a subjective view of the world, as I will explore throughout this thesis. Additionally, different researchers can defensibly make varying interpretations of the maps and publications they use in developing an argument. Similarly, there is an inherent bias in selection; I have selected maps that demonstrate my argument most clearly.

However, despite these challenges, I believe my selections are fairly representative of more general ideas about the usage of maps in politics. I would suggest that my interpretive process is not more or less subjective than other, similar interpretive acts and processes, such as the interpretation of the mapmaker in creating the map, or the interpretive process of reading any traditional textual source. Additionally, by adopting a graphical grammar I

have organized such interpretations around common elements, allowing a more structured discussion of information graphics of varying origin.

Another limitation connected to subjectivity and selection bias is that my findings may lack generalizability, because they might have varied depending on which cases I selected to present. I could have chosen other transportation projects in different cities or at different scales; these might have uncovered other salient relationships between mapping and politics, or none at all.

The decision to limit my analysis to maps of transportation projects constrains my empirical field of view. I opted to discuss maps of transportation projects for several aforementioned reasons; considering maps made to facilitate Los Angeles's postwar tract housing development or California's State Water Project might have yielded different evidence and therefore different conclusions. Throughout this thesis I have used my judgement to consider source material in a balanced manner.

Ethical Considerations

Throughout the course of this project, I have been careful to consider the ethics of my research. Throughout this thesis I have to the best of my ability verified the information contained in my primary and secondary sources, and I have avoided the distortion of facts to fit preconceived narratives. As a largely geo-historical research project, this thesis has not drawn on the participation human subjects or intervened directly in sensitive natural environments. However, research always has effects in the world, and in writing and distributing this thesis I have tried to uphold an ethical approach to research characterized by integrity, accuracy, and honesty. Where I have told others' stories, I have aimed to do so with respect. Any oversights or mistakes in this pursuit are entirely my own.

Chapter 4: The Fair Map

Summary

This section explores the political and cartographic strategies surrounding the 1980 referendum on a proposed rapid transit system for Los Angeles County, illustrating how maps can serve as powerful tools in political communication. At the heart of this examination is the unusual inclusion of a map in voter information materials for Proposition A, a referendum which proposed a half-cent sales tax to fund the construction of a modern rail rapid transit system. The map, a simple black-and-white diagram depicting a web of lines over a partial outline of L.A. County, was not just a plan for future transit routes; it was a strategic political instrument designed by the Los Angeles Transportation Commission in order to win voter support. Created by a staffer in the office of County Supervisor Kenneth Hahn and circulated to voters countywide, the map was intended to visually represent the political promise of a comprehensive transit network, linking disparate and geographically diverse areas of the county while mitigating smog and gridlock.

The debates and decisions leading up to the inclusion of the map reveal much about the political dynamics and strategic considerations of the time. LACTC Commissioners grappled with the dual challenges of creating a feasible long-term transit plan and ensuring its political palatability. The map was a compromise, a tool to balance the interests of different supervisorial districts while presenting a united vision to the electorate. This section delves into these discussions, examining how the map was used to mediate political agreements and secure voter approval.

Election Day, 1980

At 8:57 PM on Tuesday, 4 November 1980 – election day – a former governor of California walked on stage in the ballroom of the Century Plaza Hotel in West Los Angeles and started to speak. “Earlier this evening, I spoke on the phone with President Carter,” Ronald Reagan began, “The president pledged the utmost in cooperation in the transition that will take place in these coming months. I offered him my own cooperation. He graciously said that he wanted this to be the...” He trails off.

At this instant, Reagan notices two enthusiastic supporters carrying onstage a gigantic cake in the shape of the continental United States. Reagan turns towards the spectacle, and the supporter closest to him shouts “Governor Reagan, we just wanted to show you what the map of the United States looks like as of eight o’clock tonight!”

At the second the supporter finishes his sentence, the cake begins to slide off its platter. The two men jerk backwards, slowing the cake’s fall, and Reagan extends his left hand to steady the massive tray, preventing the whole state of Texas from falling to the ground. Turning back toward the lectern, and with characteristic composure, Reagan takes a

beat. He smirks. “When that began to slide, I thought maybe the world was going out just as I was getting in!” The audience erupts in laughter (Memoryretro, 2014).

The interpretations of this surreal episode could occupy many pages – Reagan, his firm hand on the map of the nation, pulling America back from the brink of disaster? An actor-cum-president in a made-for-television moment? – or it can be assigned no significance at all. But Reagan’s election, made certain in this bizarre Los Angeles moment in 1980, was an inflection point after which American Federal politics began to be imbued with the logics and prejudices of the conservative, Californian political ideology Reagan helped export to the nation.

The seeds that would grow into the neoliberalism of the late 20th century had been germinating in the landscape of Reagan’s adopted state in the decade leading up to his election. Anti-tax, anti-regulation dogma could already be seen in the politically successful homeowner-led tax revolts that spawned Proposition 13¹⁰ two years previously, in 1978; the promise of endless economic progress in the growth-machine political regimes that still ruled Southern California; and in the ascendance of large, corporate conglomerates – petroleum, homebuilding, savings and loan – against the waning of unions and the decline of local manufacturing. These anti-tax, anti-regulation movements were put on the map in California.

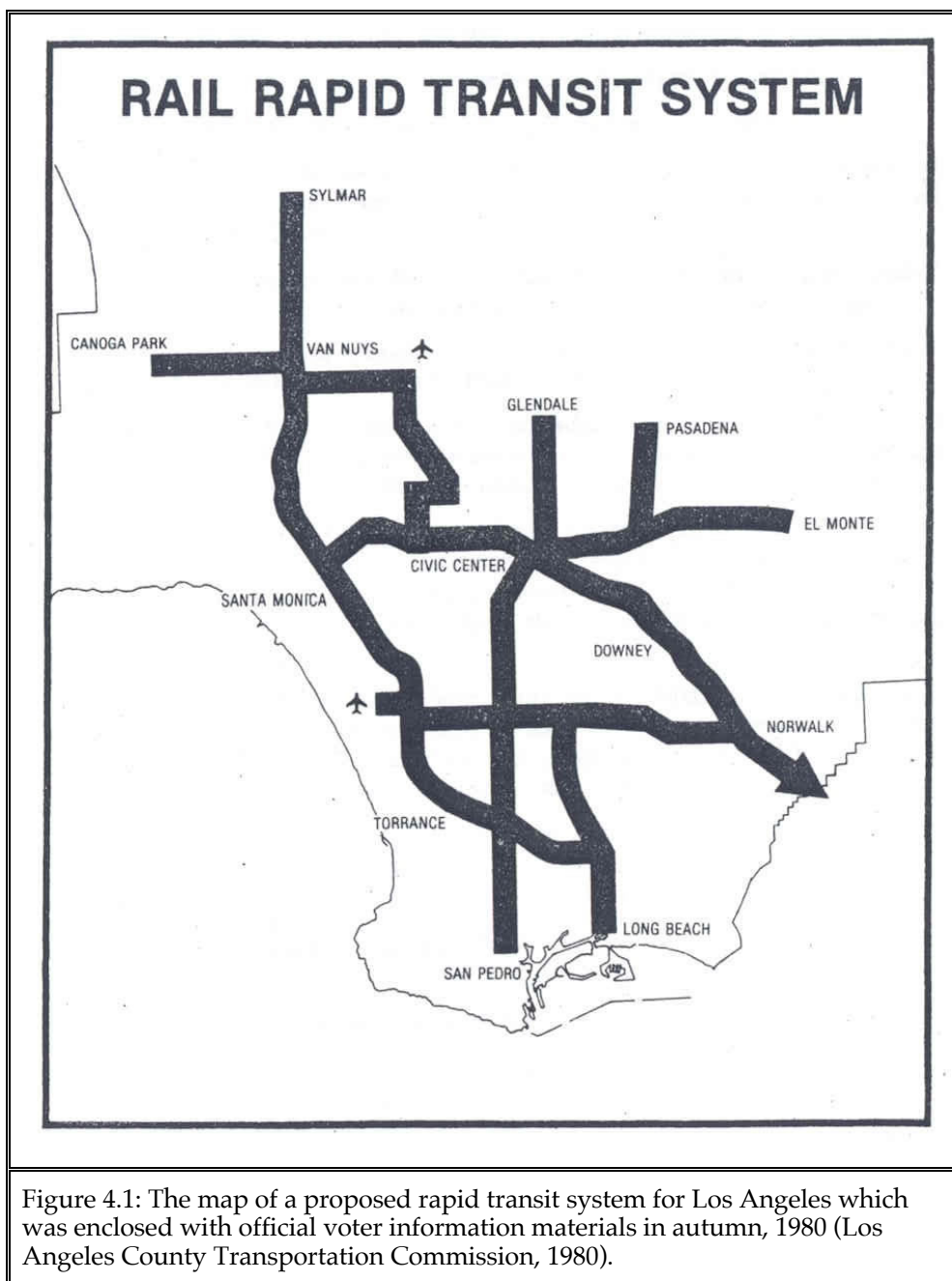
It was in this political context, on the same day that Reagan was elected, and in the same city where he would celebrate his victory, that another important vote on the same ballot was taking place. It was a referendum that would bind the county to a seemingly countervailing development, a project more rooted in the New Deal than the New Right: the publicly financed construction of a modern rail rapid transit system. This vote too, involved an unusual map, although not one made of cake.

A Map in the Mail

In the early autumn 1980, a map had arrived in millions of mailboxes across L.A. County¹¹ as part of official voter information materials for the 1980 General Election (Richmond, 2005). Alongside the typical candidate statements and dry legislative text, and quite abnormally for a such a document, the materials included a bold, simple diagram of a proposed rapid transit system (Figure 4.1).

¹⁰ Prop 13 – the “People's Initiative to Limit Property Taxation” – capped property taxes and increases and prevented reassessment of property values except during property transfers.

¹¹ L.A. County is the most populous of California’s 58 counties and the most populous county in the United States. In 1980, it had 7.5 million inhabitants. Today, it has 10 million inhabitants.



Drawn in black-and-white, a small web of lines was superimposed atop the partial outline of the County of Los Angeles, bounded by the Pacific Coast to the southwest, and by administrative boundaries to the northwest and east. The map excludes the eastern, northern, and western extremes of the county it depicts. The names of cities, placed in approximate locations, suggest destinations. An arrow, the only directional feature on the map, points toward neighboring Orange County, perhaps suggesting a continuation of the system there. It is a sharp but still inscrutable diagram.

This system, voters were informed, was coming to L.A. If approved, it would be the result of a “half-cent” (i.e., a 0.5%) sales tax, imposed countywide, to:

Construct and operate a rail rapid transit system serving at least:
 San Fernando Valley
 West Los Angeles
 South Central Los Angeles/Long Beach
 South Bay/Harbor
 Century Freeway Corridor
 Santa Ana Freeway Corridor
 San Gabriel Valley¹² (Proposition A, 1980).

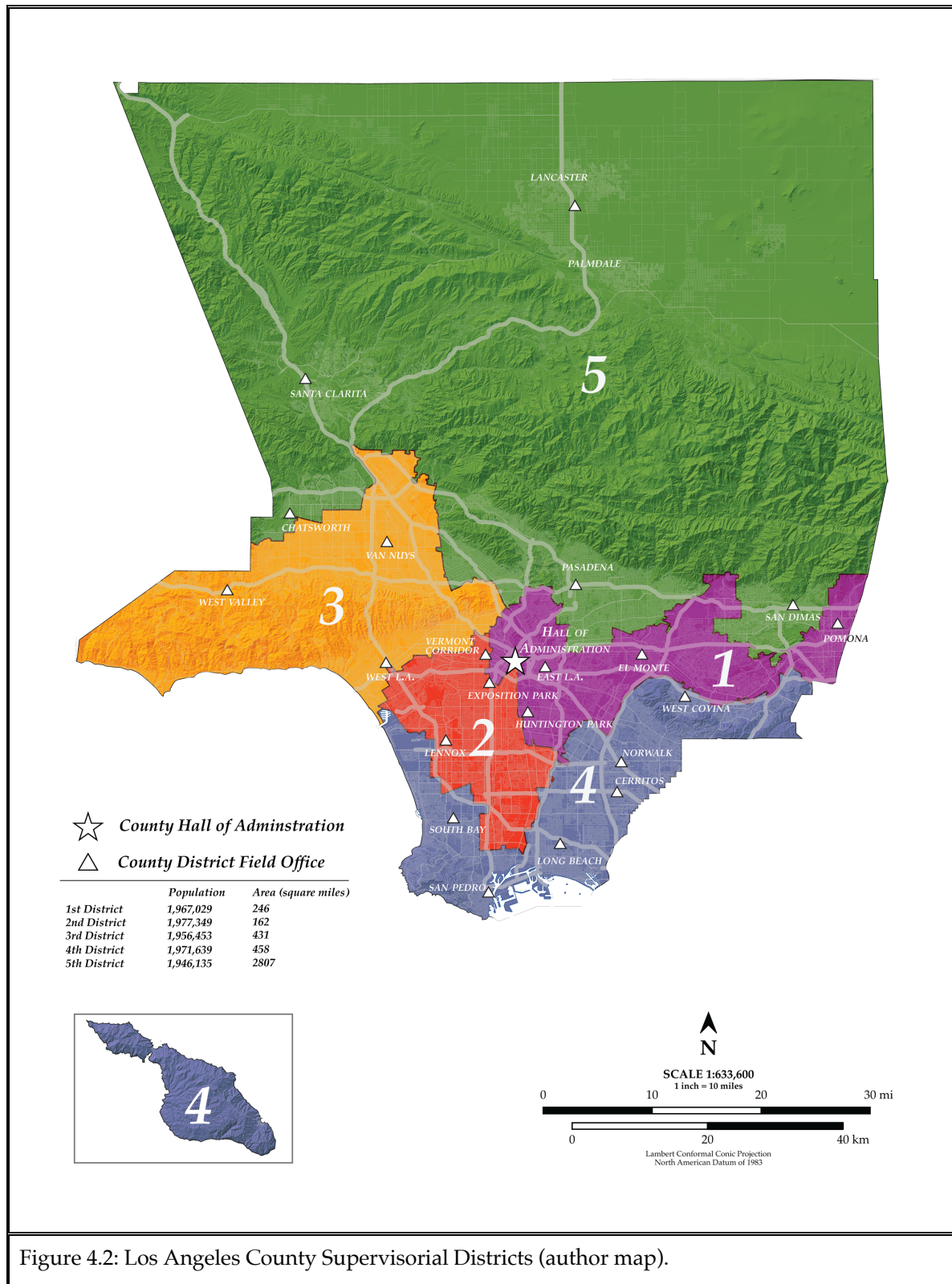
These listed areas were disparate, vast, and vaguely defined, and apparently listed in no particular order – where does South Central L.A. end and the South Bay begin? How wide is a Corridor? Where exactly is West Los Angeles? But the text was only a general overview. Attentive voters would learn they were of secondary importance to the included map in the proposed legal text: “The System,” it was written, “will be constructed and operated in substantial conformity with the map attached hereto as Exhibit ‘A’” (Proposition A, 1980). The map reigned supreme.

What the map shows is a system focused on Downtown Los Angeles (the “Civic Center”), with five lines emanating to other large cities of the county: Glendale, Pasadena, Long Beach, Santa Monica, Burbank; and the region’s two major airports: LAX and Burbank Airport. Some lines closely parallel existing freeways; others follow new alignments. The map includes no topography, an important detail in a city where difficult terrain has guided development; no stations or service patterns; and no specific order or phasing in which the system was to be constructed. There is no scale – although we can infer from the county boundaries that this system would have to stretch several hundred miles to match the map. The alignments themselves are drawn at about two miles (3 km) wide – wider, perhaps, than the distance between stations would be. The map had been originally drawn by a staffer in the office of County Supervisor Kenneth Hahn, who believed a map would help the measure pass (Elkind, 2014). While it was reminiscent of a previous 1968 rapid transit proposal, it also differed in significant ways, with new lines added and other lines absent.

But the map wasn’t only intended as a system plan (even if it might have been interpreted that way by voters). It was a piece of political communication, and a canny one at that. Although the law stipulated that “The System will be constructed as expeditiously as possible,” in fact the commissioners of the responsible oversight body, the Los Angeles County Transportation Commission (LACTC), were aware that a system matching the map was decades away at the earliest, even with a funding measure twice the magnitude of what was being considered that autumn (LACTC, 1980). They were also aware that the three previous referenda on funding rapid transit had failed, and not by particularly slim

¹² [formatting in original ballot referendum text]

margins, either (LACTC, 1980).¹³ The map would guide investment over the long term – but its more pressing purpose was to help win an election.



¹³ Overall margins of these referenda were, in 1968: -5.13%; 1974: -3.62%; 1976: -9.37% (Los Angeles Metropolitan Transportation Authority, 2017).

At a contentious meeting of the LACTC earlier that year, on August 20th, 1980, commissioners considered whether to place the measure on the November ballot, and if so, whether to include the map. One commissioner put it plainly: “I think we are being premature if we try to rush this thing for November,” he said, “one more loss at the ballot box could kill this thing forever.” (LACTC, 1980, p.13). While the Commission had been counseled by the County Registrar of Voters that including a map on the ballot itself was “not advisable,” a map could still be included in the text of the law itself, and by extension be mailed to voters in the normal Voter Information Guide that preceded elections.

County Supervisor Baxter Ward, a former television news anchor (and a rail booster) also supported the inclusion of a map in some form: “I think that we have to show some kind of plan and the map commits us to something.” He acknowledged the bargain inherent in the map under consideration: “There is no guarantee that if we don’t have a map that all the money won’t be taken and put in one single corridor,” Ward argued, “Then none of us would be satisfied” (LACTC, 1980, p.42).

In this case, “satisfied” had a specific geographic and political meaning – “satisfied” here might be defined as a mixture of politically expediency with a measure of strategic stability between county supervisorial districts. Ward is acknowledging that among the County Supervisors, division of investment across the county’s five districts was politically preferable to concentrating dollars in the denser centers of the City of Los Angeles, fully enveloped by only two of the five districts. The County Supervisors, a level “above” the municipal officials of the county’s 88 cities but less well-known, were sometimes called the Five Kings – each of them atop a fiefdom with populations rivaling some U.S. states – and those in the room that day would have understood that the map promised the geographically dispersed transit investments. As the Supervisor for the vast District 5, which combined the prosperous cities of the San Gabriel Foothills¹⁴ with the sparsely populated and poorer high desert plains north of the San Gabriel Mountains, Ward too would have favored investments that stretched transit from the core to periphery.

Conventional wisdom went that voters would never approve a countywide tax that promised to serve just one boulevard or district; anyways, the Supervisors of the three more peripheral districts would be reluctant at best to send new dollars to another Supervisor’s district if they could be spent closer to home (Elkind, 2014). The map was an expression of this understanding. But what would make everyone in the room happy was at odds with what would make an effective rapid transit system. Unlike the freeways, which benefitted from extensive property development and increasing gas tax revenues encouraged by

¹⁴ Home to Caltech, the Jet Propulsion Laboratory (Pasadena), the Claremont Colleges (Claremont), and most of the major film and television studios (Burbank and Glendale).

sprawling investment, a rapid transit system along the same lines would probably struggle to sustain itself, a fact some Commissioners would acknowledge in the room later that day.

Ward viewed the inclusion of the map as a key to the referendum's political success at the ballot box that November: "In 1974, the issue had no map and failed," Ward argued, referring to a previous transit referendum, "I would prefer to see some extensions, but this map should be the minimum to be placed before the people" (LACTC, 1980, p.42). Ward also saw the map as a "compact" between a government and its citizens; the plan would draw financial support from everyone in the county, and so it should serve as wide an area as possible: "This is a fair map ... it does something for almost everybody" (LACTC, 1980, p.42). Placing the measure on the ballot that November passed by a single vote, 6 to 5.

In sequence came a debate about the exact content of the map and ballot measure language. Edmond J. Russ, the Mayor of Gardena, a city of 45,000 inhabitants in Los Angeles's South Bay, preferred to leave the map off the ballot.¹⁵ But when this motion was defeated by a narrow vote, he advocated that the transit measure be more closely identified with the freeway system. Russ saw the freeways as a successful example of transportation planning and investment (Gardena, "The Freeway City", probably owed its existence to the county's auto-centric development). He argued for altering the map under consideration to include a line along the San Diego Freeway, roughly through the city he represented: "This could be 20 years from now before it is developed, I understand ... But 20 years from now, maybe you would want to put it in there" (LACTC, 1980, p.44). Baxter Ward, perhaps seeing an opportunity to placate a potential detractor, assented to including Russ's line on the diagram.

Ray Remy, an alternate for Mayor Tom Bradley of the City of Los Angeles,¹⁶ jumped on the concession, arguing that if the map promised a rapid transit line to every community, it would become infeasible and lacking in credibility:

I supported Mr. Russ' motion to delete the map ... what we are going to wind up is coloring the County gray and black with lines, and the current estimate is probably something like 25 years ... You might as well extend the line to every community and say that is the ultimate outcome (LACTC, 1980, p.45).

Remy, a representative of the comparatively dense City of L.A., would have been skeptical of plans that spread investment to far-flung communities less suitable for rapid transit. A supporter of the long-promised Wilshire Boulevard Subway, Remy preferred the more targeted, single-line investment to a larger web of services. Ward, fending off the attack,

¹⁵ "[I]t seems to me that we would be better off just leaving this whole map out. If you want to put the map in, then we took out the sunset provision so that means we can expand any place we want to go. I think the best way to go is to omit the map entirely. I am going to move that we omit the map" (LACTC, 1980, p.42).

¹⁶ The City of Los Angeles is the largest municipality in the County of Los Angeles. In 1980, the City of L.A. had about 3 million inhabitants.

argued that “[t]he map is settled,” insisting it was only the inclusion of a line following the path of the freeway that remained up for debate. A short procedural debate ensued, in which Ward prevailed. The final map and ballot language were approved, 7 to 4.

A Fair Map & Cartographic Compromise

Throughout this episode, we can see commissioners struggle with the tension between a map that is of undeniable significance – it will guide the trajectory of billions of dollars of investment for decades to come – yet also depicts a distant, contingent future, dependent on the outcome of the fourth referendum in a decade of failed attempts. Terms worthy of a critical geography seminar are bandied about freely – a “fair” map, a “settled” map, a map as a “compact” between people and government – each one pointing to different normative conceptions both of how maps should govern the ways resources are allocated.

We can take away three conclusions about the instrumental role of mapping processes in this debate. First, whether they supported it or not, Commissioners were reinforcing that mapmaking was the primary form of decision-making about resource allocation when it came to the development of transit in the county: they largely agreed that this was to be *the map*, i.e. the map of a future L.A. rapid transit system. Second, that the map was viewed as important, both to internal political bargaining and external marketing of the sales tax measure, shows how maps were instrumentalized to a.) make political promises more credible and b.) encode certain spatial allocations of resources into law. Third and finally, the map also translated the mainly verbal and textual plans into a graphic plan within an agreed symbolic system, guiding the future distribution of resources spatially and narrowing the wiggle room for broken promises.

It might also be that the map was more a plan of where transit investments *would not be focused*, given that a thirty-mile line was added at the drop of a hat in response to Edmond Russ’s request. The map would require focused investment in the regions of the depicted paths, but it could not guarantee their immediate construction. Could the map equally have been an attempt to placate future criticism when investment was concentrated along certain paths and not others? If so, it was not publicly discussed. In any case, it remains that the principal agents involved in decision making believed that even this highly contingent future was worth mapping, and that the lines on the map were an expression of a kind reality yet to come – a reality they were participating in making. They would have understood that public agencies and investment were guided by planning processes, of which mapmaking was one important tool. Although these processes were officially still years down the line, Commissioners saw the map as a manifestation of the bargain between politicians and as a contract with the voters, both of which were hoped would withstand future challenges. If only the people would vote yes.

In the end, it wasn’t close. The measure received 1.16 million votes, 54.3% of the referendum votes cast. By comparison, Ronald Reagan received 1.2 million votes, 50.2% of

the presidential votes cast; proportionally, Reagan was less popular than the sales tax, unusual in a county which had acquired an anti-tax reputation (County of Los Angeles, 1980). But the possibility of a new rapid transit system nonetheless proved engaging enough to win. Of course, it is not possible to attribute to the presence of the map the nearly 16-point swing observed between the 1976 transit referendum and the 1980 vote. But such a large swing in support does suggest that something was different this time around, and Commissioners certainly believed the map was crucial to the measure's public support. Although the measure would face months of anti-tax activist legal challenges owing to uncertainty about the threshold needed to impose sales taxes, those would eventually be defeated, and the measure upheld. The map became law.

Antecedents and Descendants

The 1980 Proposition A map referenced earlier proposals; it bore resemblance in particular to the 1968 Southern California Rapid Transit District (SCRTD) master plan for rapid transit, which had been voted down twelve years previously (Figure 4.3).¹⁷ These two proposals shared something in common: both depict an extensive system focused on Downtown, and the broad corridors identified by both maps are similar. Both maps proposed to connect the county's major population centers; airports; and seaports.

But there are also very significant differences, beginning with the fact that the SCRTD map was the result of a considered technical proposal whose final report was more than one hundred pages long. SCRTD had arrived at its diagram through a detailed study of potential routes, stations, and service patterns. Accordingly, the SCRTD map presents a more detailed consideration of the core "Five-Corridor" system, with station locations and alignments shown more specifically than the 1980 Proposition A map (Figure 4.1). It also includes specific recommendations about phasing, an important consideration of such a long-term project. The 1968 SCRTD proposal did not recommend a line through the Sepulveda Pass connecting the western San Fernando Valley to the Los Angeles Basin (following the San Diego Freeway); by contrast, the Proposition A map had done so, and for the dubious reason of responding to the whim of a mayor representing less than one percent of the county's population. It seems likely that the Proposition A map had been drawn in reference to the 1968 proposal, but the liberties taken in Kenneth Hahn's office distorted SCRTD's proposal such that the overall plan of the system was significantly changed.

The differences between these two diagrams reinforce the straightforwardly political nature of the Proposition A map. The LACTC had control over what kind of map to put to

¹⁷ SCRTD was the operational agency responsible for the city's public transportation from 1964 to 1993; the LACTC was the agency responsible for capital investment.

voters and had judged that their vague map was appropriate, whereas the detailed SCRTD maps were not. Yet, because the Proposition A map was what had secured a majority vote, it came to structure investment decisions according to a different logic than if the more considered SCRTD proposal had been adopted.

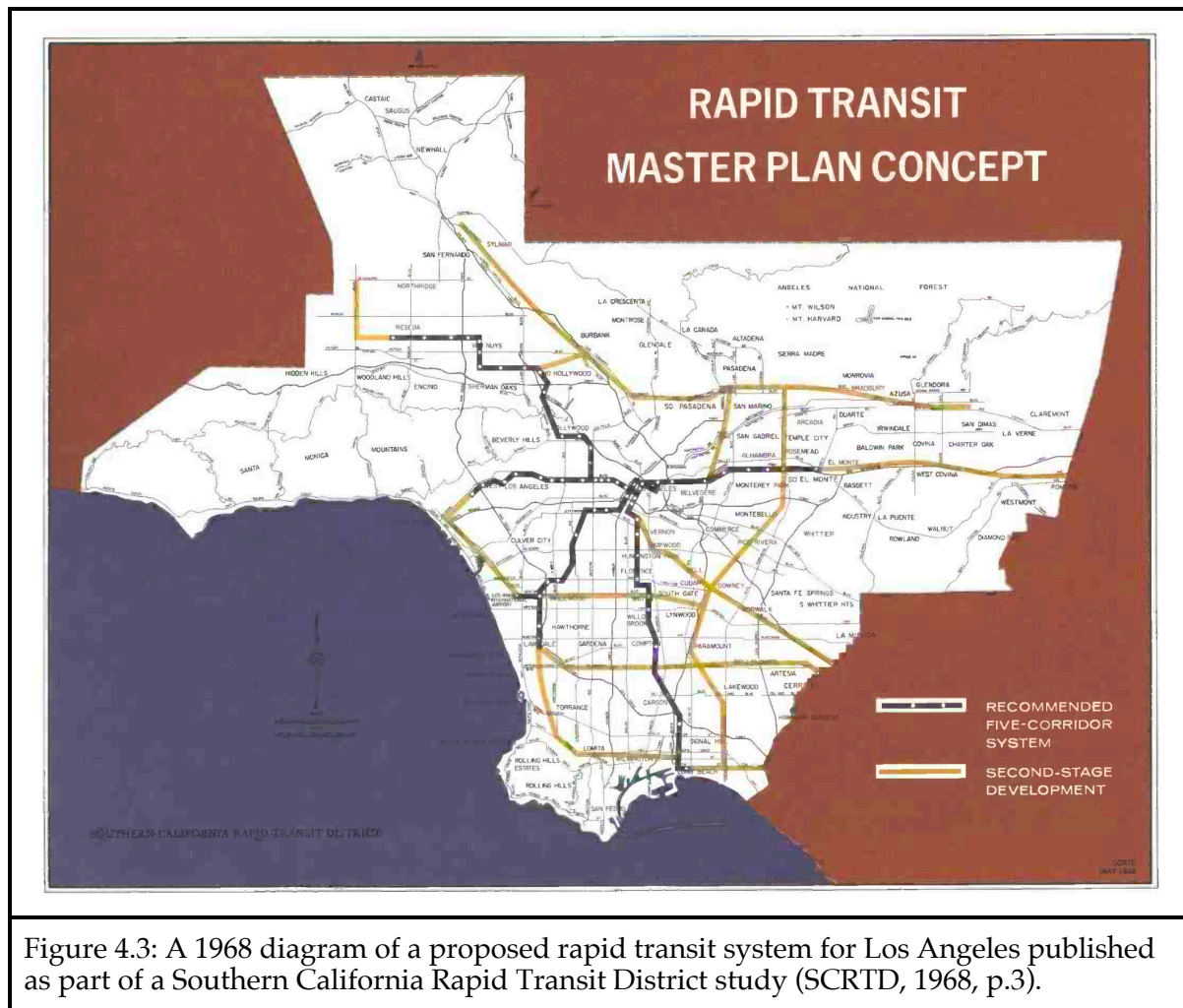
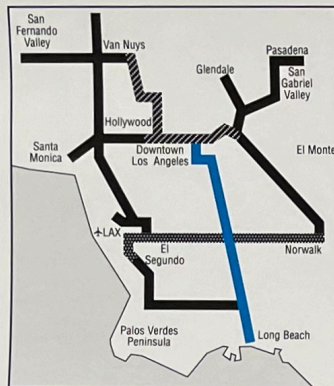


Figure 4.3: A 1968 diagram of a proposed rapid transit system for Los Angeles published as part of a Southern California Rapid Transit District study (SCRTD, 1968, p.3).

Get Ready to Ride

In 1980, county voters passed Proposition A, the half-percent sales tax for public transit. Thirty-five percent of the funds go to the design, construction, and operation of a 150-mile rail transit network. The Los Angeles County Transportation Commission (LACTC), which administers all Proposition A funds, is developing the countywide rail system.



The 22-mile Metro Blue Line (Long Beach–Los Angeles) opened in 1990. The initial 4-mile segment of the Red Line subway opens in 1993. The 20-mile Metro Green Line (Norwalk–El Segundo) is scheduled to open in 1993, depending on the progress of the I-105 Freeway construction. In the planning stages are extensions of the rail lines to the San Fernando Valley, north and south of LAX airport along the coast, to East and West L.A., and between downtown Los Angeles and Pasadena.

LOS ANGELES METRO

- Blue Line: Long Beach–Los Angeles (now operating)
- Red Line: Union Station–San Fernando Valley
- Green Line: Norwalk–El Segundo (opens 1994)
- Future Extensions



Los Angeles County Transportation Commission
 Rail Construction Corporation
 818 West Seventh Street
 Los Angeles, CA 90017



(213) 620-RAIL

FOR MORE INFORMATION OR A SPEAKER, PLEASE CALL



Los Angeles Metro

**BLUE
LINE**

Long Beach–Los Angeles

Figure 4.4: Excerpt from an August 1990 informational pamphlet showing a near-match of the 1980 Proposition A, now being circulated to naturalize the compromises made by the LACTC (author photo, LACTC, 1990).

Here, again, a circulating map served to naturalize the logic of the 1980 political compromise. A 1990 brochure (Figure 4.4) produced for the opening of the first line of the Los Angeles Metro aptly captures the path dependency, virtually reproducing the 1980

Proposition A map. The phasing proposed in this pamphlet reflects prior LACTC negotiations and draws stark contrast with the 1968 proposal. At top-center-right of Figure 4.4, the map and peri-map explanation in the brochure shows that the LACTC and SCRTD had prioritized the construction of a freeway-running section in South Los Angeles – consistent with the compromises brokered by the Proposition A map, but not even part of the core system in the 1968 proposal.

The consequences of the Proposition A map stretch into the present (Figure 4.5). The current Los Angeles Metro system owes its creation to Proposition A, and the consequences of the map used to balance the Commission and win over Angeleno voters is evident in its current form. The sprawling, suburban light rail system has been constructed largely according to the diagram placed to voters during the 1980 election, with investment concentrated along Kenneth Hahn's original corridors. The major exception seems also to prove the rule: an extension of the Blue Line (A Line), Hahn's pet project while in office, into the ever-sparsely reaches of the San Gabriel Valley encapsulates the suburban-urban compromise forged to win the map that made the Metro.



Conclusion

The 1980 Proposition A referendum and its associated map represent a critical intersection of cartography, politics, and urban planning in Los Angeles. The map was more than a mere diagram; it was a symbol of political compromise, a tool for coalition-building, and a

promise to voters. It encapsulated the aspirations and concessions of various stakeholders, each seeking to ensure that their constituencies were adequately represented in the proposed transit network. The success of the referendum, with a significant swing in voter support compared to previous efforts, underscores the map's effectiveness as a piece of political communication.

This case study illustrates a broader theme of this thesis: the instrumental role of maps in shaping urban development and political landscapes. The 1980 rapid transit map, created in a context of rising neoliberalism and conservative politics, demonstrates how maps can be used to navigate and negotiate complex political terrains. By visually encoding promises and priorities, maps like this one guide resource allocation and planning decisions with consequences spanning decades; in other words, they are tools of governance. This speaks to the inventive power of maps, highlighting their capacity to influence not just our perception of space but also the political and social realities that unfold within it.

Chapter 5: A Roadmap for California

Summary

This chapter examines the foundational role of cartography in the development of California's highway system, focusing on the *California Highway Bulletin* and its use as a political and planning tool from 1910 to 1940. The *Bulletin*, filled with evocative visuals and featuring maps prominently, was pivotal in garnering public and political support for highway construction. It helped project a vision of progress among an influential coalition of actors, the Roadbuilding Regime, concentrate state resources on roadbuilding, and promote bond sales. The chapter argues that cartography was crucial in transforming California's transportation infrastructure, shaping public perception and political action toward the realization of an extensive highway network.

The California Highway Bulletin

California's highways began with a map. In the early years of the system's construction, Charles Blaney, the inaugural Chairman of the California Highway Commission (CHC) who I introduced in Chapter 3, recounted the harrowing trip he and other Commissioners made in 1912 to explore potential routes:

We were kicked off mountain roads by mules, we were stuck in river fords, and we slid around dangerous mountain grades; we broke our windshield and punched holes in the bottom of our gasoline tank on the rocks on the desert, and after we had covered the trunk lines and laterals of California from Oregon to Mexico we went back to Sacramento and drew the state highway routes on a big map of the State (*California Highway Bulletin*, 1914, p.3).

The lines on that "big map" in Sacramento would set the direction for decades of state spending. They would, in time, form the arteries of California's current automobile circulatory system. But the "big map" wasn't used only as an internal, technical tool for the agency to plan its activities. It was the antecedent of dozens of maps developed by the CHC and deployed in the mouthpiece of roadbuilding in California in which Blaney recounted his story, the *California Highway Bulletin*.

Two years earlier, in October of 1912, the CHC had published the first issue of its official organ on the back of an \$18,000,000¹⁸ bond issue passed by voters in 1910. The journal was inaugurated demurely, as if the motive for publication was extrinsic:

Widespread interest in the state highway undertaking calls for the publication from time to time of a report from the California Highway Commission ... It is a state document. Its purpose is to present authoritative reviews of the work accomplished and forecasts of the plans proposed by the Commission (*California Highway Commission*, 1912, p.2).

¹⁸ Approximately \$550,000,000 in inflation-adjusted 2024 dollars.

However, and as I will show throughout this chapter, while the *Bulletin* was “authoritative,” it was anything but an objective observer of events. The *Bulletin* was a political publication of a politically appointed commission, one which communicated much about the beliefs of a coalition of actors, which I discussed in detail in Chapter 3, made of up influential elites and business interests who supported roadbuilding across the state. Drawing on the conventions of other mass media of the time, the *Bulletin* used evocative photos, information graphics, detailed technical drawings, and most prominently, maps, in order to imagine what progress looked like and record the state’s advance toward it.

As I will show in this chapter, the maps that were produced for and circulated in the *Bulletin* – which were given prominent place for decades on its front and back cover – were a critical tool of this project to imagine forward movement toward the shared goal of creating California’s highways. I will argue that during the period 1910 – 1940, cartography was a critical tool that allowed the CHC to approach these questions at a large scale, comprehensively conceiving of the immense territory of the State of California and giving it the power to project its imagination of the future not only onto the physical document of the map but also into the world itself – through publicity, politics, and planning.

To construct a highway system serving the entire state, the CHC first set out to build a saleable mapped image of such a system – an image whose progress over more than fifty years was produced by state cartographers and circulated among an influential audience of growth-oriented agents in the *Bulletin*. In this way, mapping was a principal tool to organize the construction of transportation infrastructure, not only in a retrospective or descriptive capacity, but as an active and agential means to 1. concentrate state resources on roadbuilding, 2. increase public awareness of and political support for highways, and 3. orchestrate the sale of highway bonds to investors.

Highways, the Freeways’ Foundation

When one considers an archetypal image of California, the freeway ought to come to mind. Los Angeles is famous for its gridlock and soaring interchanges; California’s coast for Highway 101; and San Francisco for its bridges spanning the Bay and the Golden Gate. Indeed, freeway building has been extensively studied in critical and historical geographies (see for example Bullard, Johnson et al., 2004; DiMento & Ellis, 2013; Fulton, 2001; Lewis, 1997). The core period of urban freeway construction lasted from 1950 - 1970, but one could defensibly begin this period ten years earlier to incorporate a defining event: the opening of the Arroyo Seco Parkway, California’s first urban freeway, in 1940 (Fulton, 2001, p.134). These decades saw planners and state agencies transform Los Angeles and California’s other cities with urban freeways, engineering a significant change in its degree of auto-orientation.

But the freeways did not come out of nowhere; they were generally constructed along existing state and county highways. Nor does the auto-orientation of the postwar years emerge from a pre-war nothing. The personal car has deep roots, especially in

Southern California. Already by 1925, more personal cars traveled in and out of Downtown L.A. daily than were registered in the entire state of New York at the time, despite a threefold difference between their state populations (Fulton, 2001). In the same year, there was about one registered car for every two people in L.A. (Fulton 2001, p.130).¹⁹ Los Angeles County was already home to major oil producers, gasoline refineries, and tire manufacturers. Yet, the earlier state highway²⁰ boom, during which time these interests first coalesced, has been somewhat neglected by comparison. Blow (1920) offers the last full history of the construction of California's state highway system; obviously, this account is now severely incomplete and out-of-date. Bingham (2013) published an illustrated volume based on Blow (1920). A more recent effort, although one focused only on Los Angeles 1910-1950, comes from a doctoral dissertation by Roth (2007).

The *Bulletin*, then, turns our attention to the activities of California's roadbuilding authorities in the decades before the freeway boom, during which the state and county quite literally laid the foundations for their later ambitions. Especially during the period immediately after the Highway Commission was founded, from about 1910 to 1915, the task facing California was fundamental – both more nebulous and less precedented. The state highway system had been funded by voters, yes, but exactly where and how should roads be built? An 1895 mission by representatives of the CHC's predecessor, the Bureau of Highways, had identified sketchy corridors to connect every county's administrative seat (Figure 5.1); but before any engineering could take place, let alone construction, this map diagram would have to be reformed and refined (Blow, 1920).

¹⁹ Fulton claims "more than one car for every two residents", but corroborating evidence suggests a slightly more moderate ratio: in 1925, there were 410,517 automobiles registered in L.A. County, and by 1930, there were 758,097. The county grew from a population of 936,455 at the 1920 census to 2.2 million in the 1930 census (Los Angeles Almanac, n.d.). Fulton might be wrong about "more than one car", but at mid-decade there was very likely about one car for every two people in the county.

²⁰ An note on terminology: I use "freeway" to mean a limited-access, high-speed divided express road with multiple travel lanes in each direction, usually in an urban or suburban setting. A "highway" refers to an intercity road, usually not divided and with single travel lanes in each direction, generally in a rural or exurban setting. In the 1910s and 1920s in California, the typical intercity road would likely have been an undivided paved asphalt road about 8-10 meters wide, with maximum vehicle speeds between about 50 – 80 km/h.

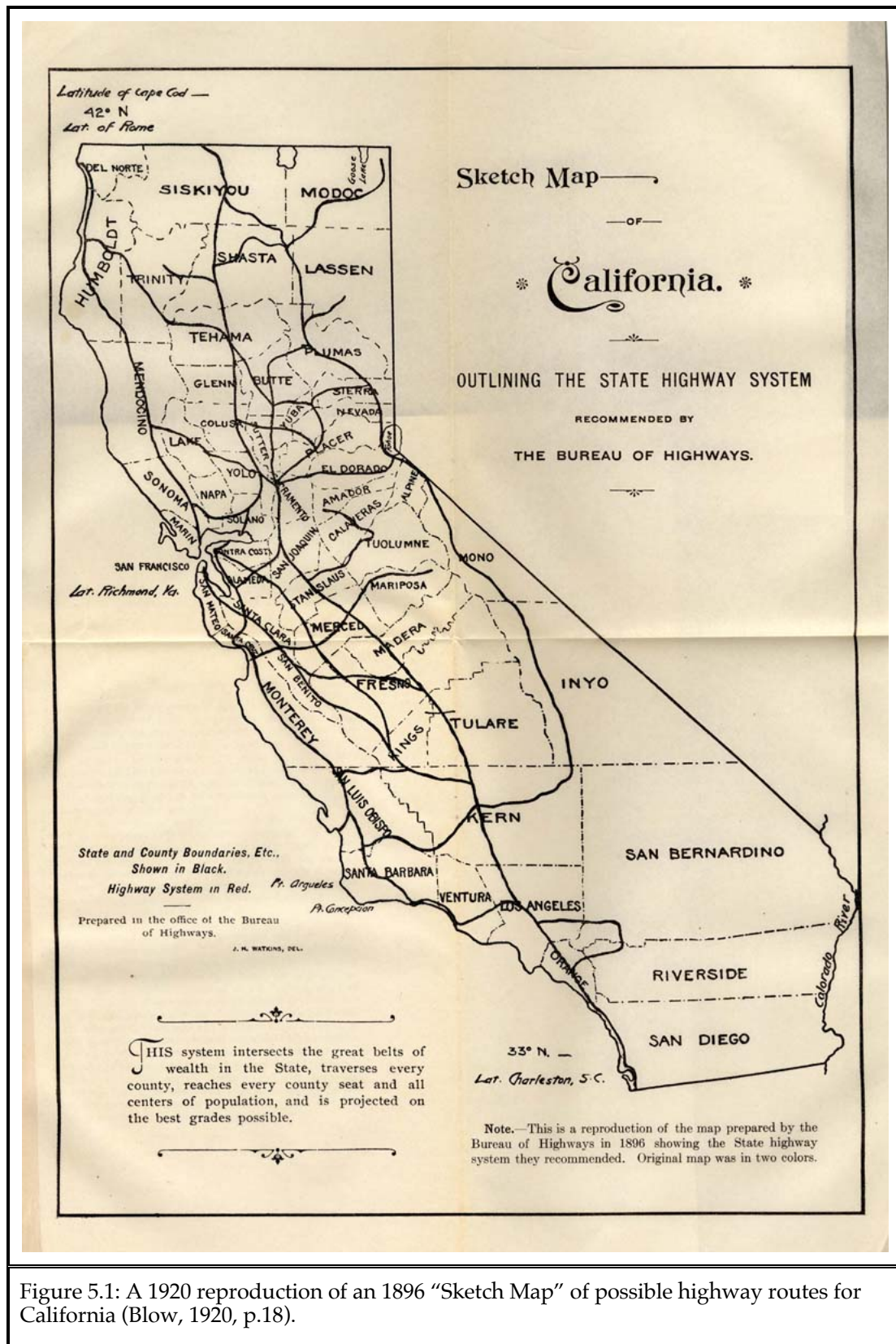


Figure 5.1: A 1920 reproduction of an 1896 "Sketch Map" of possible highway routes for California (Blow, 1920, p.18).

The Bulletin: A Roadmap for California

Polished, illustrated with maps, photographs, and technical drawings, the *Bulletin* was visually not unlike popular magazines of its era. Though it would go by three different

names over the course of its lifetime, the journal was published for more than fifty years on a regular basis (albeit with a few interruptions, including in times of war). From 1912 to 1967, the *Bulletin* and its successors – *California Highways* and *California Highways and Public Works* – traced the progress not only of roadbuilding and highway planning in the state, but also of the development of California more broadly – from a state of about 2,000,000 inhabitants in 1910, not far removed from the booms-and-busts of the 19th century, to an economic juggernaut of more than 20,000,000 people just five decades later.

The *Bulletin* was circulated within an influential group of elites, namely credentialed professionals such as surveyors and engineers, county and state government officials, members of highway and automobile associations, and the editors of newspapers with the intention of boosting the state highway project. A 1927 issue of *California Highways*, the interwar successor to the *Bulletin*,²¹ claimed a circulation of 4,000 per month to an audience of:

all [county] supervisors, all newspapers throughout the state, highway contractors and road builders, highway associations and their officials, road and highway journals ... The *Bulletin* also goes to fourteen different foreign countries" (California Highways, 1927, p.2).

In the masthead of the *Bulletin*, an invitation to "editors of newspapers" stated that they were "welcome to use, without restriction, any of the matter herein contained" (California Highways, 1927, p.1). The editor himself, J. P. Hall, was a "newspaper man" and former editor of the Daily Colusa Sun (California Highways, 1927, p.4).

The *Bulletin* represents what California's highway authorities envisioned for the future and what they were doing to make that future into reality. It traces the development of the state's road system. But it also charts, from its very beginning, the development of a certain kind of Californian ideal that we now take for granted. In florid descriptions, progress photographs, technical drawings, and, most of all, maps, the *Bulletin* grasps California's soaring mountains, rugged beaches, and vast interior basins – and connects them in the reader's mind with smooth, endless roads. From the July 1914 *Bulletin*:

When one considers that the automobile traveler will be able to enter the State from Oregon, surmount that old barrier of Bailey's Hill, pass Mount Shasta on the north, and leaving the Great Valley in the south, take a panoramic road over the mountains into Los Angeles and roll into San Diego without having shifted gears once from Oregon to Mexico so far as grades are concerned—when one mentally reviews the old road and compares with the new the safety feature of the State Highway, the economical feature and the feature of 'city streets in country places' all become apparent as contributions to the luxury of 'seeing California.' (California Highway Bulletin, 1914, p.3).

²¹ In fact, the earlier name is sometimes used in the later publication too.

This passage also demonstrates that the *Bulletin* viewed the project as one of bringing “city streets” to “country places,” that is, as a process of urbanizing the countryside. This implication hints at the roadbuilding regime’s preoccupation with the interests of urban economic interests and the urban dwellers they represented.

California’s Evolving Mapped Image: Exaggeration, Erasure, and Calls to Action

California was in no way *unknown* or *unmapped*; the state had of course been inhabited and traveled for tens of thousands of years, and whole-state maps of lesser precision were in national circulation by the end of the 19th century.²² But it bears reminding that at this time, the cartographic image of California was still very much in the process of being defined. The boundaries of the state had been set out in the Constitution of California in 1849, but reliable topographic maps of the state’s interior, which had fallen under various authorities during the latter half of the 19th century, were still a work in progress. An 1889 Federal report on geographical surveys west of the 100th meridian showed significant parts of Los Angeles, San Bernardino, San Diego, and Imperial Counties with surveys either incomplete or at least unpublished (Wheeler, 1889). Even in 1912 when the *Bulletin* began, the U.S. Geological Survey had only produced reliable topographic maps of a fraction of the state, most extensively at the scale of 1:100,000 – a scale four times that of the Survey’s finest maps. The dearth of quality and coverage of existing maps meant that surveying and mapmaking were necessarily core activities of the Highway Commission.

²² See for example a 1:1,900,000 scale [Rand McNally map of California and Nevada](#) published as part of that firm’s national Atlas of the United States in 1879 (Rand McNally, 1879).

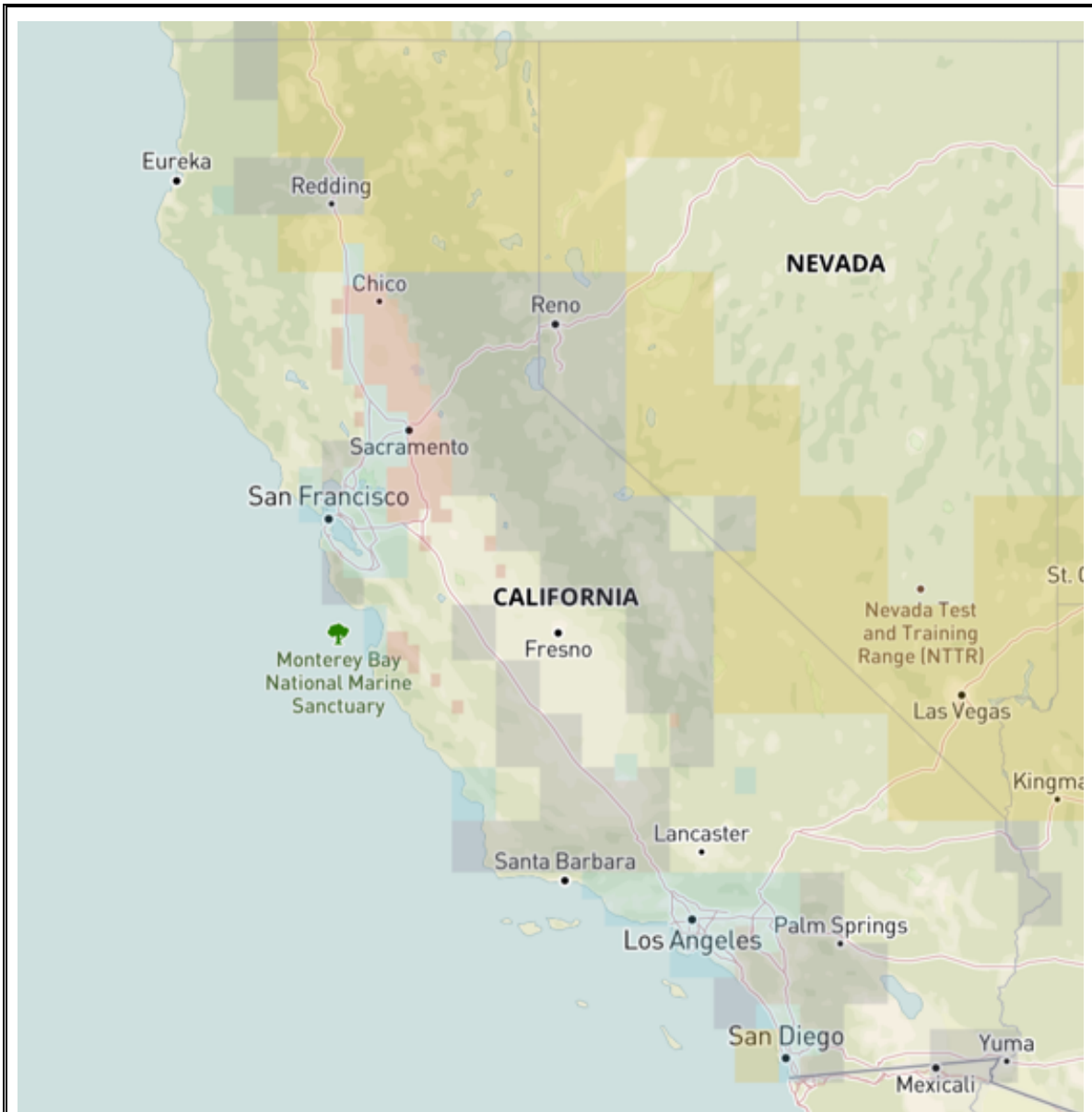


Figure 5.2: U.S.G.S. topographic map coverage of California in about 1912. Colors represent area covered and the finest available scale for that area. Yellow represents 1:250,000; grey 1:100,000; blue 1:63,000; and red 1:24,000. Much of south-eastern, central, and north-western California is not covered at any scale (U.S.G.S., n.d.).

Early *Bulletins* established certain symbolic conventions that would be repeated during the publication's half-century run. The front cover of each *Bulletin* was generally an evocative photograph of a California highway or a map of state highways. The interior pages dealt in detail with the progress and challenges of roadbuilding in the state, including detailed maps of projects and other information graphics. On the back cover of the vast majority of issues appeared a map of the whole state depicting the activities of the Highway Commission.

It is on this whole-state map to which I will focus, for several reasons. First, its prominent position as a bookend to each issue represents the cartographic masthead for the

publication, and more broadly for the whole project of highway construction in California. Second, it was a report card by which the public measured the use of their bond dollars on roads. Third and finally, it is quite literally a roadmap of the state's intentions for the future. Taken as a sequence, we are able to interpret the evolution of the state's cartographic conventions, graphical techniques, terminology, scale, and scope in order to show that these maps were not only describing what was already there. They were also prefiguring what was to come, helping to transform the contingent future into mapped quasi-reality.

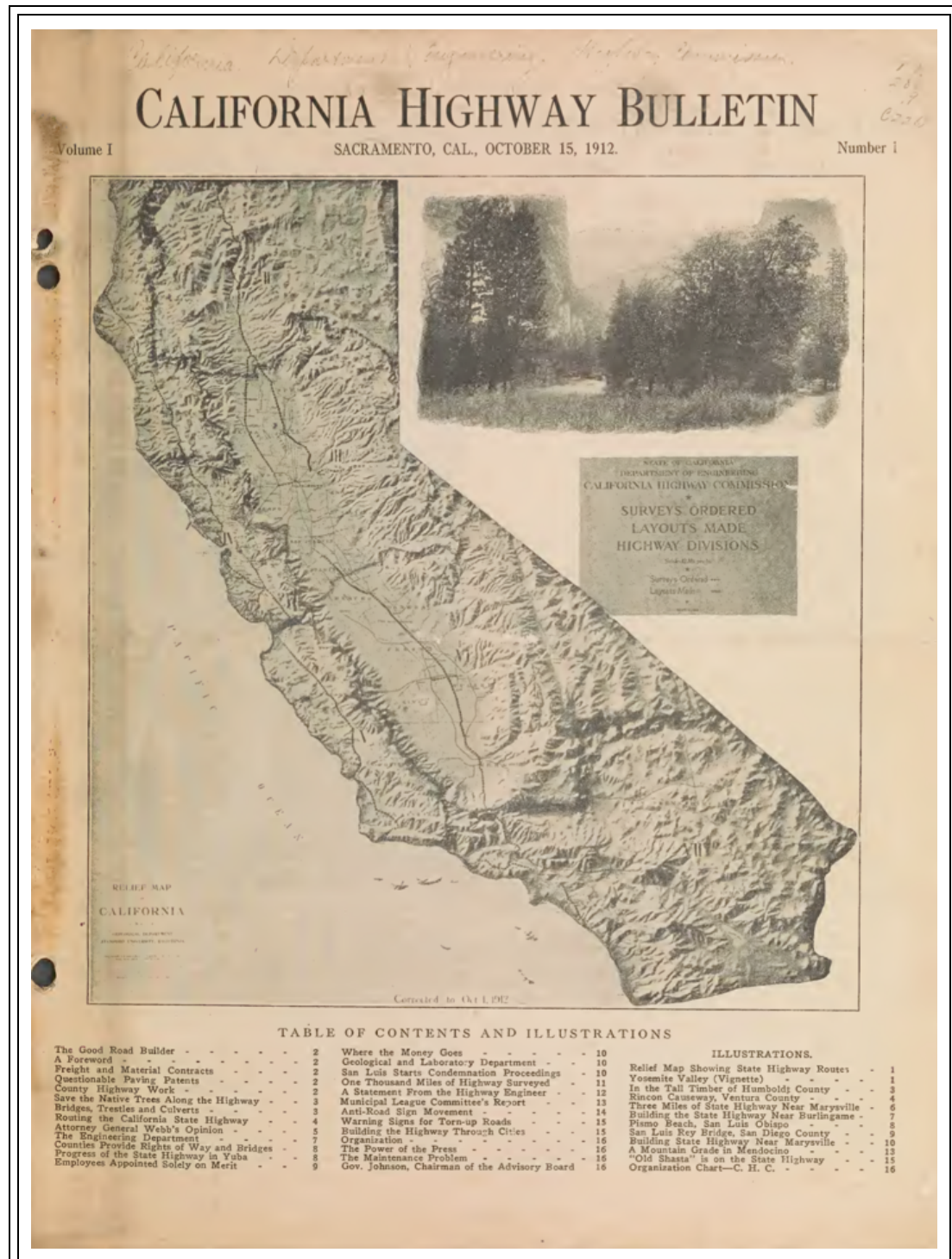


Figure 5.3: California Highway Bulletin, Volume 1, Issue 1 (October 1912). Two major highway projects are depicted, one following the Central Valley and the other the state's coastal mountain ranges. These approximate to present-day California 99 and U.S. Route 101, respectively (California Highway Commission, 1912, front cover).

The first issue's cover is a map of California crisscrossed with dotted lines of two different weights. Heavy lines represent "Layouts Made," i.e., where routes have already been surveyed and highway alignments developed. Fine lines represent "Surveys Ordered," that is, routes which have been selected by the Commission for surveying. The two main trunks of the branching tree are a road from Los Angeles, through the Tejon Pass, up the Central Valley to Sacramento, and a sketchier route tracing a coastal highway from Los Angeles to Monterey and San Francisco, resuming north of the Golden Gate toward the north-western reaches of the state. These were the two initial priorities of the Highway Commission. Both are marked in large part as "Layouts Made". There are no markings indicating existing roads – only roads to come.

From this very first issue, the scope of this cover map was the entire State of California. Although there is something intuitive about this decision in retrospect, when the outline of the state has been made iconic on everything from coffee mugs to T-shirts, the spatial ambition of connecting the entire state by road was anything but a foregone conclusion in 1912. As is pointed out in the *Bulletin* itself, California is larger than the islands of Great Britain and Ireland combined, with room left over for several U.S. states (California Highway Commission, 1913, p.18).²³ In 1912, its population was roughly 2 million – or one-twentieth the population of the U.K. and Ireland in the same year.

Setting out before the public that highways would come to connect the entire state – and offering a map of the specific routes – was an ambitious political and communications choice made by the Commission in a publication designed to circulate among an influential and likely sympathetic audience. More, representing via the *Bulletin* to the public that the construction of highways was to take place at the scale of the entire state was effectively using the map of California to launch a grand logistical, financial and engineering challenge, one which speaks to the scale California's growth ambition at the time.

Roads which seem infinite today, the map suggests, would be routine tomorrow. Reflecting on the scale of the task in July 1914, Charles Blaney wrote:

The California Highway Commission has found this State one of magnificent distances. On top of this is ... every conceivable condition of highway building from the snowfalls of the mountain sections to the intense heat of the desert and from the mountain barriers to sea-level conditions. Hence it must be evident that the

²³ Another spatial peer would be the combined areas of Germany, the Netherlands, and Belgium (California: 423,970 sq. km; DE+NE+BE: 430,154 sq. km).

construction of the California State Highway is full of more than ordinary problems (California Highway Bulletin, 1914, p.3).

These “more than ordinary problems” were seen in almost epic terms by Blaney, who compared the workforce mobilized to construct California’s highway system to that of another project to be finished in August of that year: “The men on the State Highway work possess an *esprit de corps* second only to those engaged in digging the Panama Canal,” he wrote. Whether it was morale-raising bluster or an honest attempt at sober assessment, Blaney evidently saw the task before his agency in the same league with the 82 km waterway (the Canal was “the largest, most costly single effort ever before mounted anywhere on earth” according to historian David McCollough) (California Highway Bulletin, 1914, p.3; McCollough, 1977, p.5). Undeterred by the scale of their remit, Blaney’s Commission implicitly made a cartographic compact to transform the state in the image of the map.

The Highway Commission’s mapmakers employed a variety of visual techniques to represent their project favorably to their audience. In this section, I examine several of these techniques in more detail. I will discuss the use of the hill-shade, the diminishing emphasis placed on topography, the transition to water-lining, and the use of text on these maps, in order to show how mapping practices shaped the rhetorical messages of the *Bulletin*.

Exaggeration: The Hill-Shade

The 1912 *Bulletin* map (Figure 5.3) is a hill-shaded relief: an exaggerated, in this case probably hand-shaded drawing of the state’s terrain as if viewed from above.²⁴ Hill-shades are a tantalizing *trompe-l’oeil* of mapmaking. They give the impression of an aerial view from on high – the perspective of a god. But they exaggerate light and terrain so that the subtleties of topography are easily understood – a ridgeline here, a valley there. In other words, they give topographic understanding at a glance without resorting to the inscrutable lines of the more precise contour map. This technique allows a layperson to understand why a highway might not be easily built through the Sierra Nevada, or how a line on a map of the plane-flat Central Valley might be relatively easily transformed into an asphalt strip several hundred miles long.

In the first instance, this particular hill-shade would have been drawn from other, relatively sketchy maps of the state combined with data gathered during the Commission’s own surveys. So, the fidelity of any one area is called into question by the overall process of interpolation. Accordingly, this hill-shade gets the large-scale features correct (Central Valley, coastal ranges, Sierra Nevada), but the detail can hardly be taken as gospel. Several total misrepresentations stand out: the eastern Mojave in the south of the state is not nearly

²⁴ See Kennelly 2009 for additional details on the techniques of relief hill-shading.

as mountainous as it is rendered; the ridge of the Sierra Nevada doesn't follow such a straight line at map center-right, etc.

More generally, hillshades are premised on a very liberal interpretation of astronomical fact. The sun is placed to the north-west of the map's subject area regardless of the location of a given mapped territory. This decision supports a visual illusion which helps people correctly distinguish hills from valleys, while at the same time making shadows fall on the southern faces of mountains and hills. Of course, in the northern hemisphere shadows generally fall on northern faces of mountains and hills. And, if one did occupy the position implied by the map, the apparent relief of the terrain would be greatly reduced by distant perspective.

The overall effect not only exaggerates *terrain*, but it also exaggerates *understanding*. The maps gives the visual impression that the state's cartographers had mastered the landscape, when in fact much of California remained to be mapped at any scale of utility to a roadbuilder. The result is an aspirational view of California that portrays a world in which every valley and peak was known and mastered. Such a world was only a dream when the state put pencil to paper, yet the map conveys the solidity and surety of concrete and asphalt.



Topographic Erasure & Politics on the Peri-Map

The relief-shading technique is repeated at least through July 1914. But, by July 1916 (Figure 5.4), a cartographic transformation has taken place. Here the Commission included in the *Bulletin* a two-color fold-out map of the highways in the state that had been either paved, graded, surveyed, or reconnoitered. Gone is the relief-shading of the 1912 map (Figure 5.3). Instead, the state's highway system is drawn in thick black or rust-red lines denoting stages of completeness.

Against a topographically "blank" background, roads appear alongside rivers and railroads, which can be thought of as the highway system's natural competitors and/or complements. A skilled map-reader might be able to interpret by the density and length of river lines a certain degree of topographic detail from the July 1916 map. But the effect on the average viewer would have been to erase the state's rugged terrain while at the same time calling attention to its existing routes of travel and waterways. Compared to the 1912 map, with its rugged (and in places, speculative) topography, the state rendered on this July 1916 map reads like a territory beginning to be known and tamed by human ingenuity and planning.

Perhaps not coincidentally, the institution charged with realizing such ingenuity made a direct appeal to Californians on this map, and in bold, all-caps type, no less. "TO THE PEOPLE OF CALIFORNIA," the map reads: "The map of the State above shows what the California Highway Commission has and will have accomplished with the \$18,000,000 appropriated by the State Highway Act of 1909." Yet, it also warns:

The map also shows eloquently what the Commission is not able to do. The red spaces are the gaps that will be left in the state highway system when the funds are exhausted. Whether or not these red lines will be covered over later by the heavy black lines indicating completed state highways depends on the vote of the people next November upon the new State Highways Act passed by the legislature of 1915 (California Highway Commission, 1916, folio 1).

Here, in a plea addressed to the public, the transformation of the state's highway system is tied directly to the transformation of the map.

But covering "red lines ... by the heavy black lines indicating completed state highways" is represented as the facile task of a state draftsman, not the backbreaking work of teams of laborers – who, as is mentioned in the same issue of the *California Highway Bulletin*, were often the state's prisoners. "They Are Building Roads of a Character and in Places that Otherwise Would Not Be Built," reads a headline of a feature article in the same July 1916 issue, referring to the use of "convict labor" on the State Highway (CHB July 1916: 7). "4,000 men—outcasts, hopeless—a financial and social burden," the article reads, "The convict labor law brings the need and the man together, on a working basis that appeals to both" (California Highway Commission, 1916, p.7). The *Bulletin* suggests the project is a win-win:

In September the first camp of thirty men was established in northern Mendocino. The scope of the work was gradually enlarged, on a safety first basis. We carried two camps with 125 men through the winter, working every day but Sunday, through a rain and snow fall of seventy inches. The men have been given sanitary camps that probably surpass and food that at least equals the best free labor camps. We have given them better living and working conditions, a large measure of personal freedom and under the law the crowning incentive of one day's reduction of sentence for every two days of loyal work (California Highway Commission, 1916, p.7).

Setting aside the truthfulness of the state's claims of benevolence, the text illustrates in stark contrast with the map the harsh realities of highway construction. The transformation of the map and of the state's landscape is facilitated by the erasure of the state's topography. On the 1916 map, there are no inclines to climb, no hard-rock passes to blast with dynamite, no harrowing cliff-edges, no switchbacks. There are only lines and words to be drawn together with the stroke of a pen, in the same way a voter might tick a box on the ballot itself. A vote, a bond, a line – a highway.²⁵

The omission of topography became standard practice after 1916, part of a trend of the simplification and abstraction of state maps published in the official Highway Commission organ. After the First World War, the *Bulletin* was reconstituted as *California Highways*. In 1924 (Figure 5.5), an even simpler map of the state appeared in the journal. California's counties are depicted within the ten administrative districts of the Highway Commission itself. Only county seats (seats are the administrative "capitals" of U.S. counties) are shown, with no special cartographic treatment for the state's actual capital, Sacramento (which is also a county seat), or for its largest cities. The map resembles a more freeform version of the circuit-diagram technique used in the iconic Harry Beck London Underground map, although the 1924 map predates Beck's map by seven years.

²⁵ A word on bonds. The 1916 map, with its appeal to voters for their affirmative vote in November 1916, also reproduces the spatial element of a financial challenge facing the highway system in 1914 and 1915. Funding for the State Highway was to be provided by a bond issue of \$18,000,000 carrying a rate of 4% interest. However, a downturn in the U.S. and international bond markets in the autumn of 1912 made selling project bonds difficult: "Every effort was made to market these in the East and abroad," wrote Charles Blaney in July 1914, but "the State Highways Act, a referendum law was rigid in regard to selling the bonds at par," that is, at their original face value (California Highway Commission, 1916, p.4). Investors would not accept these terms. Of the \$18,000,000 bond issue, only \$2,105,000 had been sold. Bound by law to sell the bonds at face value, the Commission turned to California's county governments to make up the difference – in exchange for state promises that highway maintenance would be a state concern rather than a county one – and managed to sell another \$5,400,000 worth of bonds. Los Angeles County was by far the largest purchaser of these bonds, 70% of which were "a contribution on the part of the Los Angeles banks" (California Highway Commission, 1916, p.4).



Figure 5.5: A 1924 map “showing progress of paving and other improvements on the California state highway system” (California Highway Department, 1924, p.16).

Disappearing Water & Water-Lining

As topography was erased in the July 1916 map, so water was erased by 1924 (Figure 5.5). Only one river is depicted: the Colorado, and only because it forms a boundary of the state.

The coastline, which had already declined in topographic if not geometric (i.e., three dimensional vs. two dimensional) detail from 1912 to 1916, by 1924 foregoes relief shading and grey value distinctions between ocean and land. Instead, it adopts the anachronistic visual technique of “water lining,” in which coastlines are depicted by spaced contour-like lines suggesting waves or ripples. California’s eight Channel Islands, present in both 1912 and 1916, are gone, along with labels for the state’s many bays, points, and channels. Omissions of water features from land maps are typical (see Monmonier, 2008, pp.147-161), and vice versa, but it is evident from the declining cartographic importance of the coast in these maps that California – to which and within which settler travel had been dominated by ocean-faring ship for several hundred years – was increasingly connected not by water but by asphalt.²⁶

Taken together, the erasure first of the state’s topography, then of its rivers, and finally of its detailed coastlines, emphasizes the new system of roads over all other geographic features. The state, whose ambiguous hill-shade gave the impression of a *terra incognita* a decade before, was now represented in the *Bulletin* as a territory disciplined by highways.

²⁶ Passenger ship service from Los Angeles to San Francisco ceased in the mid-1930s.

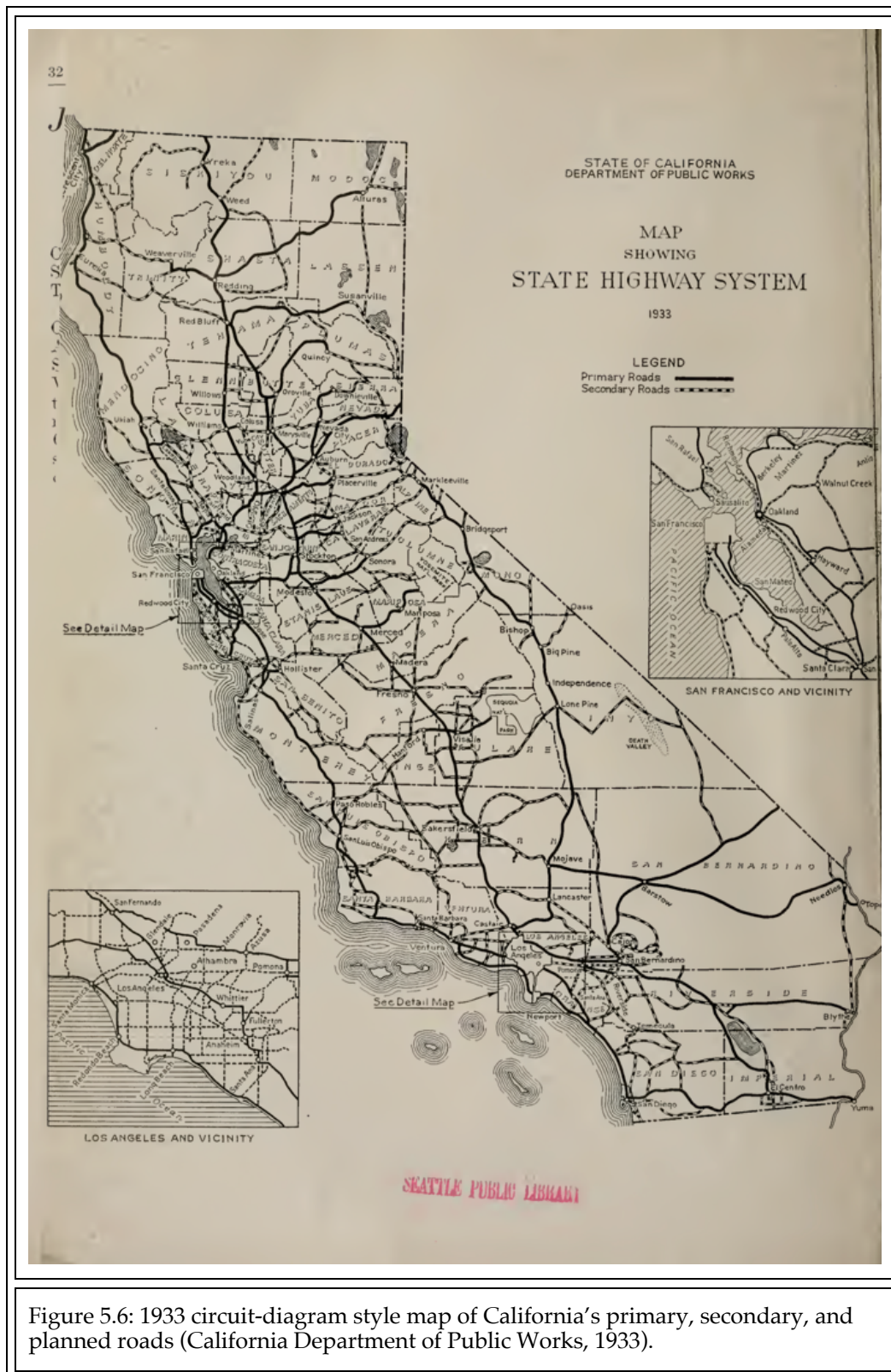


Figure 5.6: 1933 circuit-diagram style map of California's primary, secondary, and planned roads (California Department of Public Works, 1933).

Cartographic Ambiguity

By 1933, the circuit-diagram map reflected an increasingly complex network of highways. Compared with 1924, the 1933 map (Figure 5.6) is significantly more detailed, showing major and minor towns along what are here termed "Primary" and "Secondary" roads. The

Channel Islands have returned, but the water-lining technique remains. For the first time, the state's two largest cities, San Francisco and Los Angeles, are placed into detail inserts.

Here begins a curious cartographic mystery. Roads are classified by the legend according to two categories, Primary Roads (unbroken black lines) and Secondary Roads (closed dashed lines). But many roads in the Los Angeles area, depicted as *open* dashed lines, conform to neither category. They could defensibly be interpreted as secondary roads drawn with insufficient detail. But then why the discrepancy with the San Francisco area, where two categories are used correctly?

This distinction is important not only as a historical footnote. The extent to which the state took on county and local roads – either by building them or by taking over their administration from other governmental entities – reflects the increasing tendency by the Highway Commission not only to *connect* the state's cities *by highway*, but to *transform* the state's cities *with highways*, namely by increasing the capacity for higher speeds and greater volumes of automobile traffic in urban areas. Whether these roads were already built or mere proposals helps explain how the Highway Commission saw greater L.A. at a certain moment in time and points to the origins of the later, 1940 - 1970 freeway boom.

We must turn to the 1939 *California Highways* back cover map to get to the bottom of this conundrum. The 1939 map (Figure 5.7) is largely similar to the 1933 map – a change in the routing of a secondary road in northern Lassen County and another in Merced County are two of only a few subtle differences. However, the legend introduced a third category: Proposed Roads, represented by two unbroken dotted lines. With the addition of this category the 1933 map is perhaps clearer – the single unbroken lines of greater L.A. now appear to denote proposals, rather than primary or secondary roads. Still, the distinction comes down to a judgement about which visual details of a line are more important in connoting categorical differences.



Another possible explanation for the cartographic ambiguity is that the roads depicted in the Los Angeles area already existed in some form but were slated for improvement or administrative takeover by the state. The state published larger-format, more detailed road maps in addition to the smaller maps in the *Bulletin* and

Highways. In one such map from 1934 (Figure 5.10), a detail of the Los Angeles area insert shows Figueroa St., a major thoroughfare, in three states of completion over the course of its long north-south run: in the language of this particular map, certain sections are either “High type, improved, or under contract,” “Unimproved,” or “Proposed”. Although it is not labeled, Figueroa St. is depicted on the 1933 California Highways map as a dotted line – so is this a primary road or a proposed road? The answer is: both.

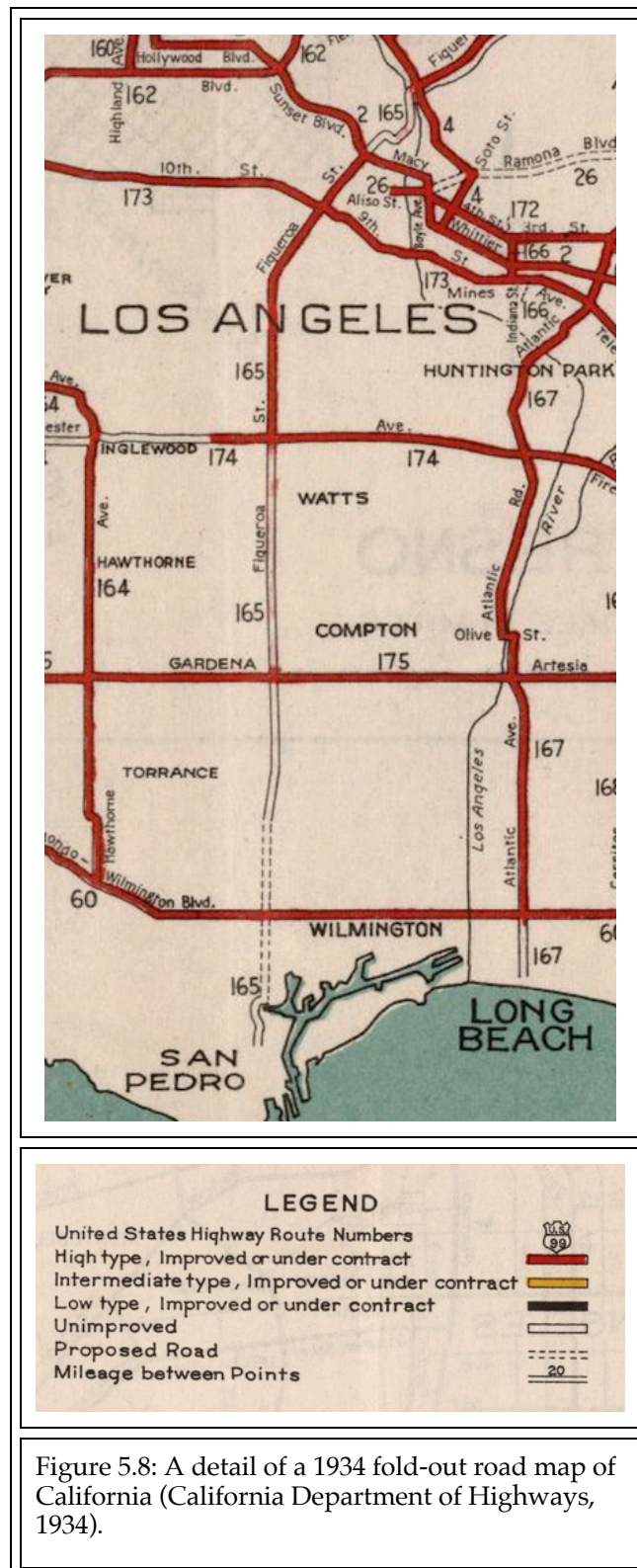


Figure 5.8: A detail of a 1934 fold-out road map of California (California Department of Highways, 1934).

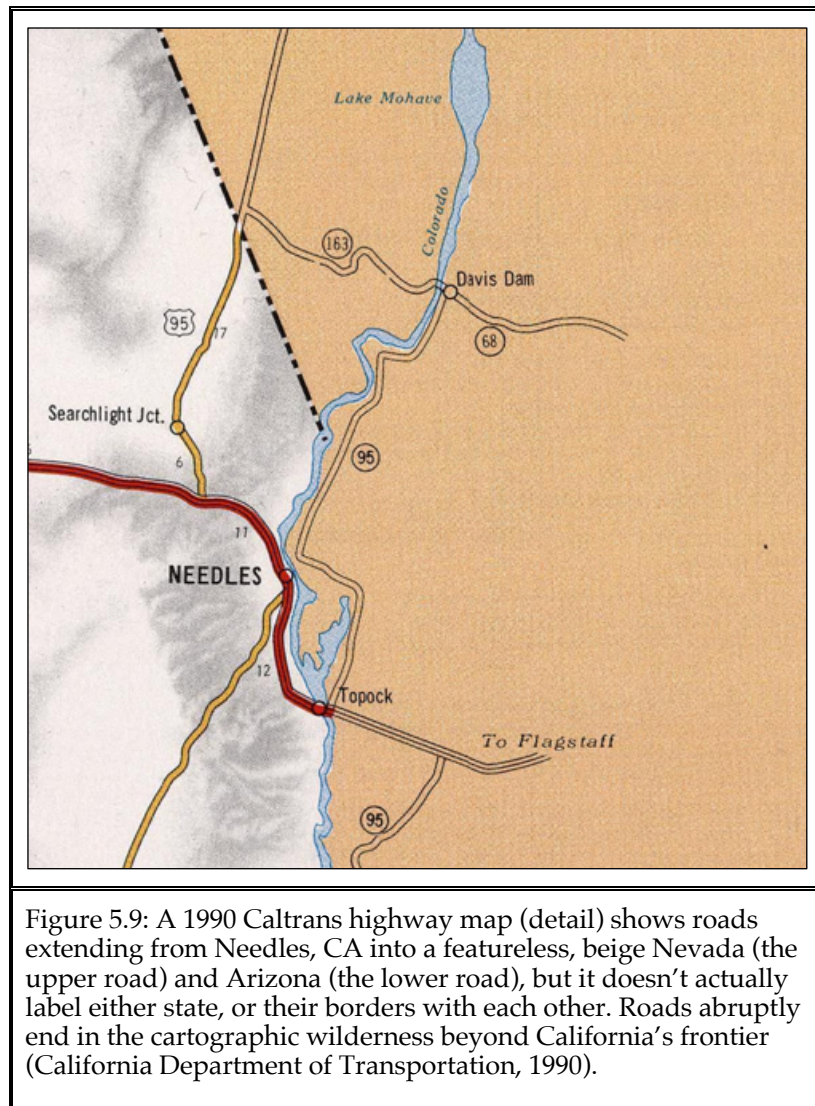
Suffice to say that state cartographers were rapidly mapping a system that was also under construction – in this way maps were a layered record of the activities they reflected: surveying, engineering, construction, and actual use by motorists. Distinguishing what was

proposed from what was completed may not seem a difficult task, but at the scale of the state and with the cost of cartography, it is not surprising to find discrepancies and confusion at the level of the individual road.

California Alone

Another convention established in the first map (a convention that is replicated in numerous official sources beyond the *Bulletin's* heyday) is that adjacent states and countries, namely Oregon, Nevada, Arizona, and Mexico, are not depicted. In a graphical move reminiscent of the 16th-19th century misunderstanding by European and East Asian cartographers of California as an island west of North America, the state is drawn apart, with scarcely a reference to its neighbors.²⁷ When California's neighbors are depicted, usually the borders between these other jurisdictions are not, a practice repeated in official sources as recently as 1990. The state also generally used the same borderline for its domestic and international borders. So, it is not possible to tell from the map from whether a road leaving California enters Oregon, Nevada, Arizona, or Baja California:

²⁷ [A Japanese cartographer reproduced the error as late as 1865.](#)

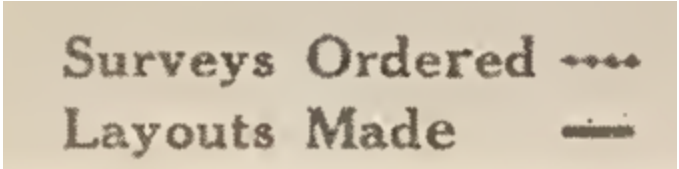
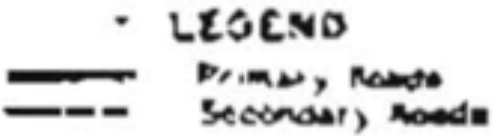
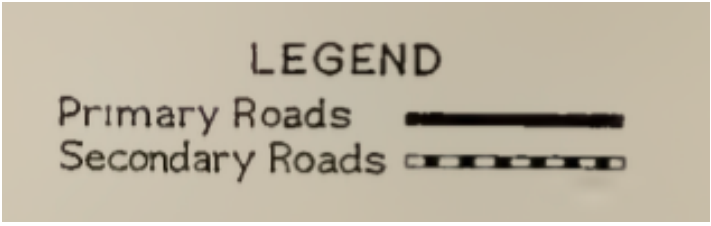
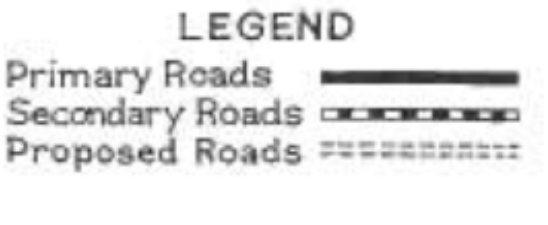


One effect of this cartographic convention is to emphasize the concentration of state resources on improvements *within* California while de-emphasizing the broader, Federal effort (in which California was also a participant and beneficiary) to facilitate interstate travel and commerce through roadbuilding. Perhaps the Commission and its successor agencies felt duty-bound to the people of California first; or, perhaps they understood that internal improvements were likely to be more politically popular than extensive (and expensive) roads to neighboring states built through California's fortress-like mountains or endless south-eastern desert. Perhaps the state wished not to upset its considerable private railroad interests, who dominated interstate transportation in those days, with competing public infrastructure. Or, finally, it was perhaps not necessary to telegraph interstate achievements to the public as much as "domestic" state ones, since Federal grants did not come to California through the sale of bonds. In any case, if it rendered them at all, state

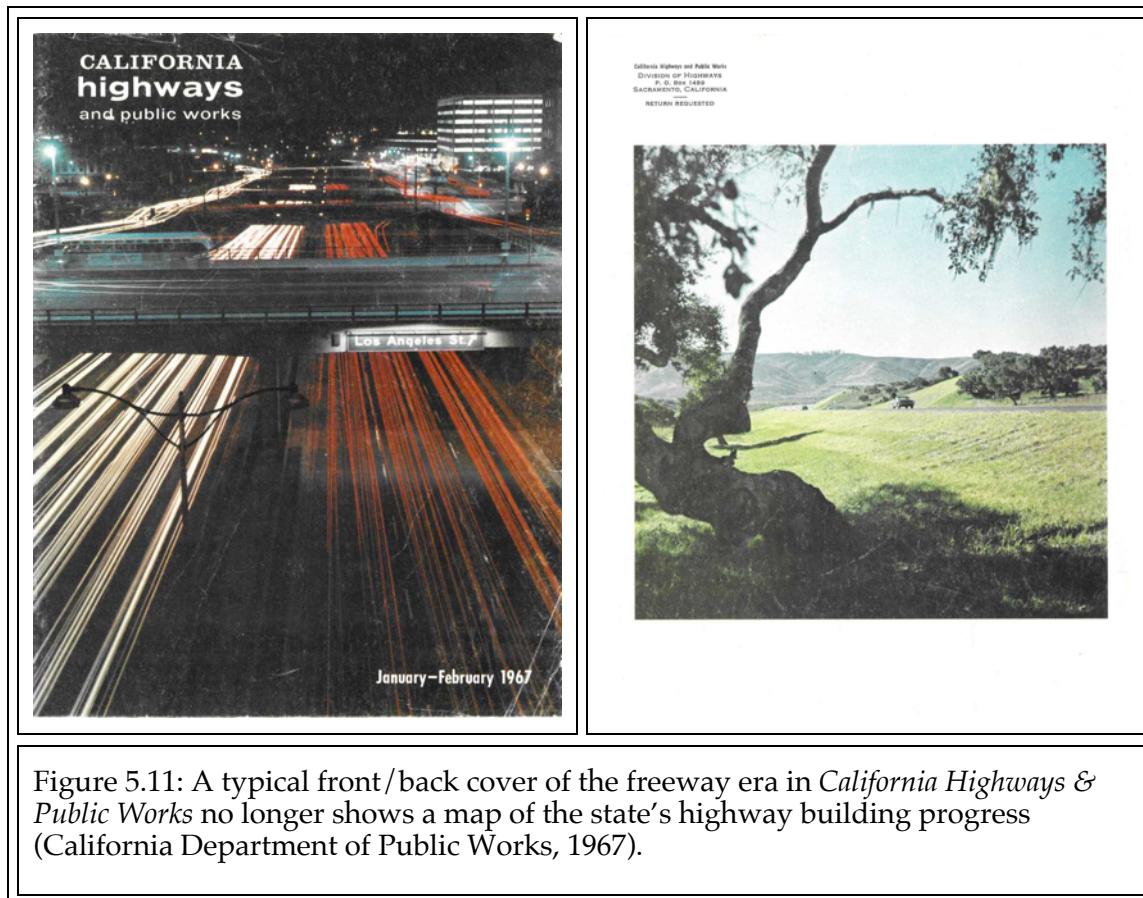
cartography represented roads to neighboring states and countries almost as coincident to the “main” project: California Highways.

While some cartographic choices were stable over long periods, others evolved on a more continuous basis. The whole-state maps’ categorical terminology shifts markedly over the course of the *Bulletin’s* existence. In 1912, the whole-state map focused on *Layouts Made* vs. *Surveys Ordered*. The focus is on the progress of mapping, surveying, and planning, rather than of construction. By 1916, construction having advanced, the map shows roads in descending order of completeness as either *Paved*, *Graded*, *Surveyed*, or *Reconnaissance*. Over the years, the maps turn their attention more to what has been finished, although the future remains prominently on the map. By the 1930s a more enduring terminology had established. Routes were separated into three categories: Primary Roads, Secondary Roads, and Proposed Roads.²⁸

²⁸ The convention of depicting proposed roads as dotted lines would extend to other maps and publications of the era, including the Thomas Brothers’ Guides, a form of navigational street atlas, which began publication in 1949 and generally included proposed roads through the 1990s.

	1912
	1916
	1924
	1933
	1939
5.10: Cartographic representations of road planning & construction 1912 – 1939 (drawn from the California Highway Bulletins of the corresponding year).	

By the end of the 1930s, maps published in the *Bulletin* and its successors became less speculative and more descriptive. As the complexity of the state's individual highway projects grew – with the onset of freeway construction in the 1940s, urban renewal, and the passage of the Federal-Aid Highway Act in June 1956 – the spatial focus of *California Highways*' maps grew more detailed rather than more sweeping. More interior pages were dedicated to intricate studies of interchanges and urban-fabric level diagrams, and the whole-state map appeared less frequently on the back cover, replaced with evocative images of new freeway developments (Figure 5.11). I would suggest this change largely reflects the state's success in molding California in the image of its early map, such that it was no longer a politically potent cartographic image toward which to aspire. It was concrete reality.



Conclusion

The maps in the *California Highway Bulletin* serve as a testament to the farsighted efforts of the California Highway Commission from 1910 to 1940. Through meticulous cartographic work and strategic communication among influential actors, including a coalition of urban elites, business interests, credentialed professionals, and voters, the Commission was able to transform abstract plans into tangible realities, fundamentally reshaping the state's

landscape and infrastructure. The *Bulletin* not only documented the progress of roadbuilding but also actively influenced public perception and political will, reinforcing the interconnectedness of California's cities through diverse terrains with publicly funded roadways. This publication, with its detailed maps, evocative photographs, and technical drawings, encapsulated the ambition and determination of an era that set the stage for the later freeway boom of the mid-20th century. By charting the evolution of California's highways and the cartographic image of the state, the *Bulletin* illustrates the profound impact of early 20th-century planning and mapping on the state's development, emphasizing the enduring legacy of these foundational efforts in shaping California's modern transportation network.

Chapter 6: Discussion

In the preceding chapters, I examined two empirical examples illustrating the role of maps in coalitional governance over transportation in California.

In Chapter 5, I assessed how a single map was instrumentalized as a critical part of a political campaign to marshal public funds for a County-wide system of rail rapid transit. Following the minutes of a pivotal meeting of the LACTC, I traced the political dealmaking that resulted in the map being placed on the November 1980 ballot. I suggested three broad takeaways: first, that regardless of their agreement or disagreement with the specific map, Commissioners accepted that the map depicted the future system, i.e. that it had a specific political meaning; second, that the level of concern shown over the map in the LACTC meeting spoke to the power of maps in a wider political discourse; and third that the map translated the textual promises into an agreed graphic grammar, signifying one way maps exert power through encoding spatial allocations of resources into law.

In Chapter 6, I followed the efforts of the California Highway Commission to map and circulate maps of its efforts to build roads statewide over a period of 30 years. I showed that agents of the California Highway Commission first traveled the state conducting on-the-ground research and surveys in order to imagine the road system in a mapped form. I then examined which cartographic techniques they used to represent the project which with they were tasked. I situated these maps in their published context – the California Highway Bulletin and its successors – to suggest that this series of maps was used as a tool not only for technical planning, but also to establish an image of progress and organize political support for road bond referenda. I also followed how visual cartographic techniques, i.e. the maps' graphical grammar, changed over time in order to diminish the significance of obstacles to development and increase the importance of roads.

I will now turn to a discussion of these cases together. Throughout, I address the question of whether mapping supports the development aims of urban governance regimes; and, if so: how maps motivate and structure development toward certain outcomes.

Instrumentalization of Maps

These two cases demonstrate that maps played an instrumental role in decision-making both to the LACTC and to the California Highway Commission. In both cases, this instrumental role was multifold. First, in the case of the Proposition A metro diagram, the map was a way for Commissioners to encode a political compromise in law. Second, the map was meant to serve as a compact between voters and the LACTC, committing the government to build the system depicted. Third, the map was a tool of institutionalizing how public investment would be spatially distributed long into the future. Not only the map but also the future it depicted was given democratic legitimacy by the voters, reinforcing this particular map as the rightful ancestor of subsequent transit planning efforts.

In the case of the California Highway Bulletin maps, the Highway Commission instrumentalized maps in order to depict, first, a state mastered by cartographers and engineers, and second, a state transformed by roads, all in advance of those roads' realization. They used maps to organize political support around a specific vision of a road system for California, soliciting votes on the peri-map and circulating maps among influential actors in the Roadbuilding Regime coalition. Finally, by showing potential investors a credible image of where their funds would be spent, the California Highway Bulletin maps encouraged the sale of roadbuilding bonds. Maps were (quite literally) front-and-center as the Highway Commission imagined the future of California as a territory connected by roads.

In both cases, we can see an empirical basis supporting the truth-claiming, representational power of maps discussed by Harley (1989; 1990), Wood & Fels (2008), Wood (2010), and others: mapping here was a *representational* act imbued with state power toward a desired outcome. The maps were "insisting that something is *there*" as a powerful way of "insisting that something *is*" (Wood & Fels, 2008, p.191, emphasis in original). The "something" varied: a metro system, a system of highways. So did the "there": Los Angeles County, statewide. But the power of the "posting" – the spatial/meaning proposition – as Wood (2010) described it is apparent. A state agency insisting that a future system "is there," even in the future tense, is the first step toward organizing its realization among responsible actors. These instrumental roles speak to the fact that mapping is highly influenced by political aims, undergirding the basic argument of critical cartographers that maps and mapping are always politically and socially constructed.

A Changing Territorial View

Although these cases concern two different temporal and spatial scales, they have much in common. In both cases, maps were used as a tool to represent, naturalize, and invent space in a certain way, to a specific audience, with political intention. The production and circulation of maps in both episodes was tailored by underlying political views held by the map producers about the nature of the territories depicted – these views could be described in one way as an opinion about the desirability and necessity of their respective infrastructure projects, and in another, as a belief about their feasibility. These political opinions are reflected in the maps' content, i.e. in the map-object itself, but also in the role these maps played as part of their respective coalitions.

In the case of the Proposition A map, the County of Los Angeles is depicted in a restrained graphic grammar that leaves much room for interpretation. While the general vicinity of each metro line's path through territory is given, the map does not show whether lines would be above ground or below; where stations would be located; or what patterns of service would be instituted. This diagrammatic quality of the Proposition A map was surely

intentional, but for political more than for technical reasons. The map was produced, probably by a nonprofessional cartographer, to reflect a political compromise of the various county commissioners and placed to voters to legitimize. It did not suggest an especially deep technical consideration of the development, and an entire line (whose realization would surely have required hundreds of millions of additional dollars) was added at the last minute at the request of a single commissioner in order to win his vote. This overtly political yet also somewhat casual treatment of a map whose passage would structure decades of investment suggests that the map was equally important to the coalition in its role as a politically expedient tool to settle political differences. At the same time, the fact of the map's use in a relatively high-stakes political discourse suggests a view at the LACTC that sweeping interventions in the territory of Los Angeles County were facilitated by mapping, especially mapping with democratic legitimacy.

The California Highway Bulletin maps had a political audience that is more diffuse over space and in time. The 1916 folio, which directly encourages the voters of California to support the authorization of highway bonds, is the most overt example of the map-object having an explicit political intention, but the subtler details of the maps' changing graphic grammar are suggestive of a through-line of political intent. As roadbuilding – and mapmaking – became more institutionalized, maps made of the system became less effortful.

These examples recall Krygier & Wood's (2011) argument that maps are statements for locating facts in order to make a case. The case being made was twofold – a case to the public, and a case among Commissioners. The graphical vagueness of the map was not a mistake, but rather supported a just-enough idea of the system – enough to settle the score at the LACTC and enough to attract the votes of residents of Los Angeles County. The maps' circulation in public discourse was not incidental to this purpose but rather central. As Vujakovic (2018; 2020) and legal scholars of sovereignty (Rajkovic, 2018; Rajkovic, 2019; Johns, 2023) have argued with regard to nation-states and empires, the circulation of maps in public discourse also served to reinforce the credibility of each governmental body's project, prefiguring the territorial vision shown on the map. Both the Proposition A map and the maps featured in the California Highway Bulletin presented a changed view of the territory of the State of California, reflective of political decisions made in the present and with consequences stretching into the future. This changed territorial view, endowed with cartographic authority, was leveraged by two different coalitions to marshal resources toward these two ambitious projects.

Urban Scale and Rescaling the Urban

Maps in both cases helped to define and redefine a new scalar reach of their respective coalitions' power, changing ideas about what and where the "urban" is. In the case of the

Proposition A map, political aims were particularly urban in scale. The LACTC's changed view of Los Angeles County was only diagrammatic, to be sure, but it nonetheless made specific promises. The map helped to invent an idea of the future in which the vast region was somewhat disciplined by a network focused on the Downtown core. It imagined a region where some of the challenges of suburban mobility, namely traffic and air pollution, had been mitigated. The map recognized that Los Angeles County was more than just the City of Los Angeles and a few neighboring municipalities; it envisioned a system scaled to the region as it existed in 1980 rather than re-booting the urban and interurban transit systems of the prewar period. It wasn't exactly defined where lines would run, nor where stations would be located, but it was clear that transformative investment was to take place in specified corridors.

In the case of maps of California's burgeoning system of roads, political aims were larger-scale, but the coalitional aim was nonetheless focused on redefining the relationships Californians had with their cities. The Highway Commission, backed by the Roadbuilding Regime, aimed to connect urban areas to each other and open new markets for trade with roads crossing the state's hinterlands. Maps helped bring into focus a vision of a future that was anything but certain in 1910, but by 1940 was virtually *fait accompli*: a state where intercity travel by car or truck was routine, safe, and comfortable; and, where suburban and peri-urban travel was facilitated by automobile. Highway mapping efforts thus had also had the effect of *rescaling* what constituted the "urban."

We might view this role of maps through Aalbers (2014) concept of performativity or the related concept of cartographic materialization (Lindberg, 2019); here, though, maps prescribed *investment* rather than *disinvestment*, creating the conditions under which respective coalition actors could intervene in territory. Maps depicted the broad "regulations" of the state-sanctioned spatial future, de-risking pure speculation into balanced investment. By delineating in ink the future corridors of roads and railways, the maps in both my cases materialized trajectories of state investment over time. This surety offered by a coalition endorsement of a particular plan is basically a financial asset in the form of a partial indemnification against loss. Property accessible to markets will virtually always be worth more and be easier to buy and sell versus remote, inaccessible land. Confidence is collateral.

The map thus "performs" a future uneven economic landscape where proximity to planned transportation infrastructure is considered as an asset in the present. The price gradient created by a given area's distance from a planned road into Los Angeles, for example, could therefore generate a kind of market "voltage" – a "field" between areas of high and low investment potential – which motivates the "current" of capital to flow by showing investors where (and where not) to target investment, increasing market liquidity by juicing demand in a particular area, introducing first-mover advantages for speculators,

and providing a clear distinction in value between areas. Mapping transportation infrastructure does not only prefigure the movements of future cars and trains, but also the migration of capital and speculators (see Smith, 1979 for the canonical rent gap theory of capital migration back to the city). Maps and mapping are therefore a part of rescaling the urban not only in representational but also in material terms, as plans become plats, and plats become new (or renewed) centers of population and production.

The success or failure of the coalition to deliver on its cartographic plans has significant implications. Consider a first-mover who has purchased a large tract of land on the basis of a planned road, with the intention to eventually recapitalize the increased ground rent of a newly-accessible residential subdivision. A countdown to coalition success begins immediately in the form of interest payments on any debt financing (or impatience from equity investors). The non-delivery of a cartographic promise for any reason would mean bankruptcy not only for the speculator but also negative returns for any investors. So, sticking to the plan and pushing forward quickly becomes absolutely critical. Mapping the road onto territory has created a class of interested “stakeholders” – debt and equity investors, of course, but also property agents, insurance companies, potential general contractors, urban planners, architects, environmental engineers, merchants, and homeowners – in a state-led infrastructure development. Whether the plan is any good or not, or whether an alternative with an as-of-yet unorganized class of stakeholders might be preferable in lieu, is immaterial against the interests of those organized around realizing a specific line on a map. Maps, once leveled to the task of describing the future, tend to develop not only social and political momentum, but also financial momentum.

The Future, Present on the Map

In the temporal dimension, both maps deploy particular graphical techniques to reveal something of the present and show something of the future. Although it is a map for a metro system, the 1980 Proposition A map reflects the existing car-oriented urban mobility hierarchies of its time – the system imagined is massive (hundreds of kilometers of tracks) and it is scaled to suit rather than to disrupt this established urban development pattern. The map uses a simple graphical grammar to show a metro system that is strikingly reminiscent of, and in some cases duplicative of, the existing freeway system. Its graphical elements also subtly demonstrate the salient political rivalries of the time, depicting a sprawling metro system whose construction would spread investment across all five of the county-supervisory-district fiefdoms. But the future is there, too: the map plots what Commissioners knew to be a decades-long trajectory of investment in rapid transit, the consequences of which are still with Angelenos today. The rights of way and trackage that this map caused the county to identify and construct have had cascading effects not only for mobility but for all the ways in which mobility is connected to other geographic patterns:

zoning, land use, and economic and social opportunities. Hardly anywhere would the path dependencies of lines on a map be a more apt description than when those lines are used to guide investments in capital-intensive rail transportation infrastructure.

In the case of California's highways, notions of present and future on the map shifted over time. At the beginning, California's highway maps show a provisional future of highways overlaid on an impression of the present, an estimate of the state's current geography. Practically all indicative lines on the page represent highway projects dependent on referenda about which the outcome was impossible to know. Paradoxically, it is these most highly contingent maps that strive for verisimilitude with the territory they depict, as if topographical surety could offset the uncertainty of the highway-building project. Especially at the beginning, the peri-map, rich with calls to action and demonstrations of need, also reflects the efforts to organize and legitimize the roadbuilding project. As the state project of roadbuilding gathered momentum, though, cartographic techniques in wide circulation reflected a more diagrammatic approach to the development of new roads. Having demonstrated in the real world the feasibility of transforming lines on the map into roads across the state, the need to convey cartographic omniscience was apparently diminished.

Cartography Supporting Political Aims

In both of my cases, maps and mapping helped reinforce the idea among coalition leaders that there was a "ready availability of means" to realize their respective projects, to quote Stone (1993). If what *can* be achieved is an important consideration in what a coalition ought to prioritize, making projects feasible (or at least making them *seem* feasible) is a prerequisite to making them desirable in coalitional governance. In both cases, the use of maps as authoritative visions of the future promoted the wider aims of each coalition.

In the case of Los Angeles, the development of rapid transit buttressed the overall growth aims of the Los Angeles coalition, mainly by promising to mitigate gridlock and smog, the downsides of L.A.'s rapid growth which were directly attributable to transportation. To the extent that rapid transit could alleviate some of these problems, the region could continue to accommodate the rate of growth it had come to expect since the beginning of the 20th century. The map reflected an effort to demonstrate that the LACTC had the means to solve a pressing problem that was in the interest of the overall coalition to address – they showed a compromise that would lead the coalition out of a problematic status quo and toward a different future.

The Roadbuilding Regime used maps firstly to suggest to their audience their mastery over the territory of the State of California and subsequently to erase cartographic barriers to development. I have suggested that this impression of mastery was somewhat exaggerated by the graphic grammar of the map in order to emphasize the feasibility of the

roadbuilding project in connecting the state's major urban areas. By contrast, barriers to the roadbuilding project, namely the state's terrain and water features, gradually faded into the cartographic background. But both techniques served to reinforce feasibility of roadbuilding. As roads were indeed completed over time, the reiteration of completed roads on maps that could increasingly be called descriptive rather than speculative increased the feasibility of uncompleted roads.

In both cases substantial funds were to be raised by the sale of public bonds; but, democratic authorization of bonds was only one part of the transaction. Bonds also had to be purchased by investors. Therefore, the map cannot only be seen as a tool to entice voters *to approve bonds* but also for investors – mainly banks, but also insurance companies, pension funds, and individuals – *to look approvingly upon bonds* as an investment vehicle. Here our maps ability to increase the impression of feasibility were also useful. They showed coalitions' financial partners *where money is to be invested*, facilitating the financial aspect of each project.

Politics Curtailed by Cartography

If mapping was politically useful to coalitions, in both cases coalition politics was also structured, and in some ways narrowed, by the limitations of mapping. In the case of Los Angeles, the Proposition A map promised voters a vast rapid transit system linking disparate points of the county. This decision, a visual representation of political compromise, made such a project look more feasible, and therefore desirable, to the Commission. Where previous referenda had failed without a map, Proposition A passed with one. But while enshrining the cartographic compromise may have bolstered the governing coalition's legitimacy, it is questionable, even doubtful, that such a system was desirable for the Angelenos they represented. A sprawling, duplicative metro system that paralleled existing freeways was liable to further entrench the suburbanization whose ills it was supposed to cure, and, sure enough, present-day Los Angeles County is still grappling with the ramifications of this decision. The recent Regional Connector project, an effort to facilitate regional-scale journeys through Downtown, gave Los Angeles the distinction of having the longest light-rail line in the world, stretching from the suburban foothill communities of the San Gabriel Valley to Long Beach, the region's largest port.²⁹ But there is a reason most cities do not build 78.1 km light-rail lines – they are slow, expensive to build and operate on a rider-per-distance basis, and struggle to support the dense, sustainable urban development patterns they are supposed to encourage. Meanwhile, other, denser parts of the city such as the east-west Wilshire Boulevard corridor, the north-south Vermont Avenue corridor, and the communities situated on either side of the crucial Sepulveda Pass

²⁹ This is a title Los Angeles took from Belgium's Coast Tram.

have endured decades-long waits for adequate rapid transit development. Enshrining the map into law structured the range of possible outcomes over decades, meaning today's choices reflect compromises of an increasingly distant past.

California's Roadbuilding Regime used maps to envision the automobile-oriented state that coalition partners sought to create. Detailed maps circulated in state publications gave the roadbuilding project credibility, even as the development of highways remained contingent. As roadbuilding garnered political support and funding in the form of highway bonds, and, eventually, gas tax revenues, something of a self-reinforcing cycle was created. This is the "infinite money machine" referenced by Fulton (2001); the endless supply of roadbuilding dollars arguably led to roads dominating intercity travel in the state, at the expense of the future development alternatives, namely intercity rail. As the State of California is today engaged in an arduous infrastructure project to connect the state's two largest metropolitan areas with high-speed rail in order to relieve the overburdened and fossil fuel-intensive road system, it is ironic that the early 20th-century roadbuilding project was partially premised on building alternatives to the railroad monopolies of the era.

Ordinal Growth in a Pre-Digital Age

These cases add historical perspective to previous discussions of the linkage between mapping and urban governance (Lee, 2019; Rosen & Alvarez-León, 2022; 2023; Alvarez-León 2024). As in the case of Paris discussed by Lee (2019), mutual affirmation of maps by administrative actions (and vice versa) helped to give varying interests a shared frame of reference. In the Parisian case, discussions and decisions referred back to maps as evidence of previous decisions and decisions, creating a kind of recursive legitimacy. This is also the case in Los Angeles during the Proposition A referendum and afterward; the approved map was the basis for future maps of the system, and the design of the system as it is today.

Rosen & Alvarez-León (2022) described the ability of digital "renderings" to extend the possibilities for land-based profit in digital growth machines, allowing accumulation *without* intensification of urban land use. These two cases suggest *digital growth machines* share a dependency on infrastructure with their non-digital antecedents. If not always digital, maps and mappings for both the digital growth machine and more historical examples of growth coalitions are still *ordinal* – they *order* development, and they can *ordain* development. And, such digital growth machines are themselves manifestations of vast networks of grounded infrastructure that are the 21st-century counterpart of California's roads and railways.

The digital growth machine may not wholly depend on the intensification of land use in urban space – but in some ways, neither did its antecedents, which instead intensified land uses in rural hinterlands and the periphery of cities when necessary to sustain growth. Digital growth machines *do* depend on the intensification of spaces that we do not yet

conceive of as urban. Like the roads that connected Los Angeles to San Francisco via then-remote mountain passes, fiber optics now crisscross far-flung parts of the planet to facilitate an ever-more-connected status quo. The digital growth machine does not necessitate skyscrapers in city-centers, but it necessitates distant data centers, networks of fiber optics and electricity, power plants, cooling infrastructure, cable termini; it requires ships to lay cables and ports to maintain them; some urban platforms even depend on orbital launch infrastructure and the intensification of “space”-space. My two cases hint at a throughline of expansion and intensification of territory, but also an expansion of the definition of the urban, that is bound up with the development of infrastructure and the mapping required to realize it. What is contested is a definition the *urban*, and here, digital maps as well as paper ones have much influence over what we recognize as urban, and where we locate it.³⁰

³⁰ See for example the maps for the New Agenda Under Planetary Urbanisation project, e.g. Schmid & Topalovic, 2023

Chapter 7: Conclusion

A Rear View

In California, maps have helped urban coalitions imagine and transform territory, shaping political outcomes by making certain kinds of futures appear attainable. In this thesis, I have shown how two such coalitions – the Los Angeles Rail Coalition and the statewide Roadbuilding Regime – used maps and mapping to imagine ambitious projects and organize interested actors toward their achievement. Deploying specific cartographic techniques which projected onto territory an imagined view of the future, these two coalitions used maps and mapping to make even very ambitious goals, such as the state highway network and the Los Angeles Metro, seem *feasible*, which is a watchword of urban governance regimes.

Urban regime theory proposes that a coalitions' possessing the means to achieve a certain goal reinforces the desirability of its accomplishment, because coalitions are preoccupied with demonstrating their achievements to their members and supporters. Thus, the capacity of maps to render *feasible* a specific vision of the future helps to organize diverse coalitions of actors around these visions. In turn, there is a tendency for mappable projects to attract resources, thereby reinforcing the likelihood of their accomplishment. In this way, mapped imaginaries in California gathered political momentum and were transformed into physical realities. This tendency for maps and mapping to contribute to the credibility of transportation projects in urban California has come to characterize a cartographic approach to problem solving not only in planning but in politics.

Yet, like all tools, maps have specific affordances, or possible actions, and different maps have different affordances. The same project imagined differently on a map might appear more or less feasible, affecting whether a coalition considers it desirable. It is true that a project easily envisioned on the map is not synonymous with an easily realized project. But a project which *cannot* be mapped likely will not politically benefit from the cartographic authority afforded to its mappable alternatives.

The instrumentalization of maps in the cases of Proposition A and in the *California Highway Bulletin* illustrates the significant role cartography has played in shaping urban and regional development in California. Throughout both cases, I demonstrated that maps served as far more than representations of geographical reality; they were powerful tools of political communication and even instruments of governance. By encoding political compromises and projecting visions of the future, these maps facilitated the mobilization of public support, structured investment decisions, and influenced the allocation of resources.

In Los Angeles, the 1980 Proposition A map not only depicted a proposed metro system but also embodied a political agreement, leveraging its democratic legitimacy with long-term consequences for subsequent transportation policy and planning. Similarly, the

maps which appeared so prominently in the *California Highway Bulletin* were less technical plans than strategic political tools used to garner support among influential interests and elites for the project of roadbuilding. Depicting a contingent future, these maps helped create a shared vision of progress and reinforced the feasibility of ambitious infrastructure projects, leading to their prioritization by two different urban governance regimes.

Both cases highlight the political nature of cartography, demonstrating that maps are socially and politically constructed objects that can influence perceptions and decisions about space and development. My cases especially underscore the inventive power of maps in urban governance, where the act of mapping itself can shape political outcomes by making certain futures appear within reach. The use of maps in these contexts also reveals the interplay between cartographic representation and political intention. Whether through the useful graphical vagueness of the Proposition A map or the decreasingly labored graphic grammar of the *Highway Bulletin* maps, the cartographic choices made by these coalitions reflect their underlying political goals and strategies. These maps did not merely mirror the present but actively shaped the future, reinforcing specific conceptions of territory and rescaling expectations of the urban landscape.

These historical examples provide insight into the broader dynamics of urban governance and infrastructure development. They illustrate how maps can support the aims of growth coalitions by making projects seem feasible and desirable, thus facilitating the mobilization of resources and political support. At the same time, they show how the limitations of mapping can constrain political choices and entrench certain development patterns, with long-lasting consequences.

As the urban is increasingly conceived of as a digital as well as a physical phenomenon, and as geographic research progressively considers the production and circulation of digital spatial data in the construction of urban spaces, I hope that the above conclusions from these two cases will remain relevant. Future research would continue to develop answers to the question of how these new digital tools, along with their analog antecedents, do not only transform urban places but also urban governance, and in turn come to transform what we think of as urban in the first place. How they engender new conceptions of the extent and reach of the urban and related configurations of coalition? Such projects might also consider the enduring dependency of digital growth machines on infrastructures of transportation, whether of humans, goods, or digital data; the development of these physical networks will remain contentious – a matter of politics as well as technology – even as the expansion of the digital domain eschews some types of land-use intensification.

Finally, these two cases also hint at the radical possibilities of recognizing and cultivating the imaginative power of maps. What better futures might be feasible, if they were made to seem so through mapping? Maps have provided the power for cities to

extensively reconfigure their territories, but this power need not be reserved exclusively to discipline landscape to suit commerce or capital. Recent efforts by Los Angeles County to reimagine the neglected Los Angeles River as the mainline of a countywide ecological network through mapping suggest this transformative potential (Figure 7.1). The maps produced and circulated to support the L.A. River Master Plan reflect a genuine remapping of the way the county and its government sees its ecology. Their efforts have already helped to restore to the center of contemporary collective imagination a river whose channelization in concrete stands as the local archetype of an overzealous modernism. Section by section, map by map, they are charting a course to uncover, recover, and re-discover the river that made Los Angeles.

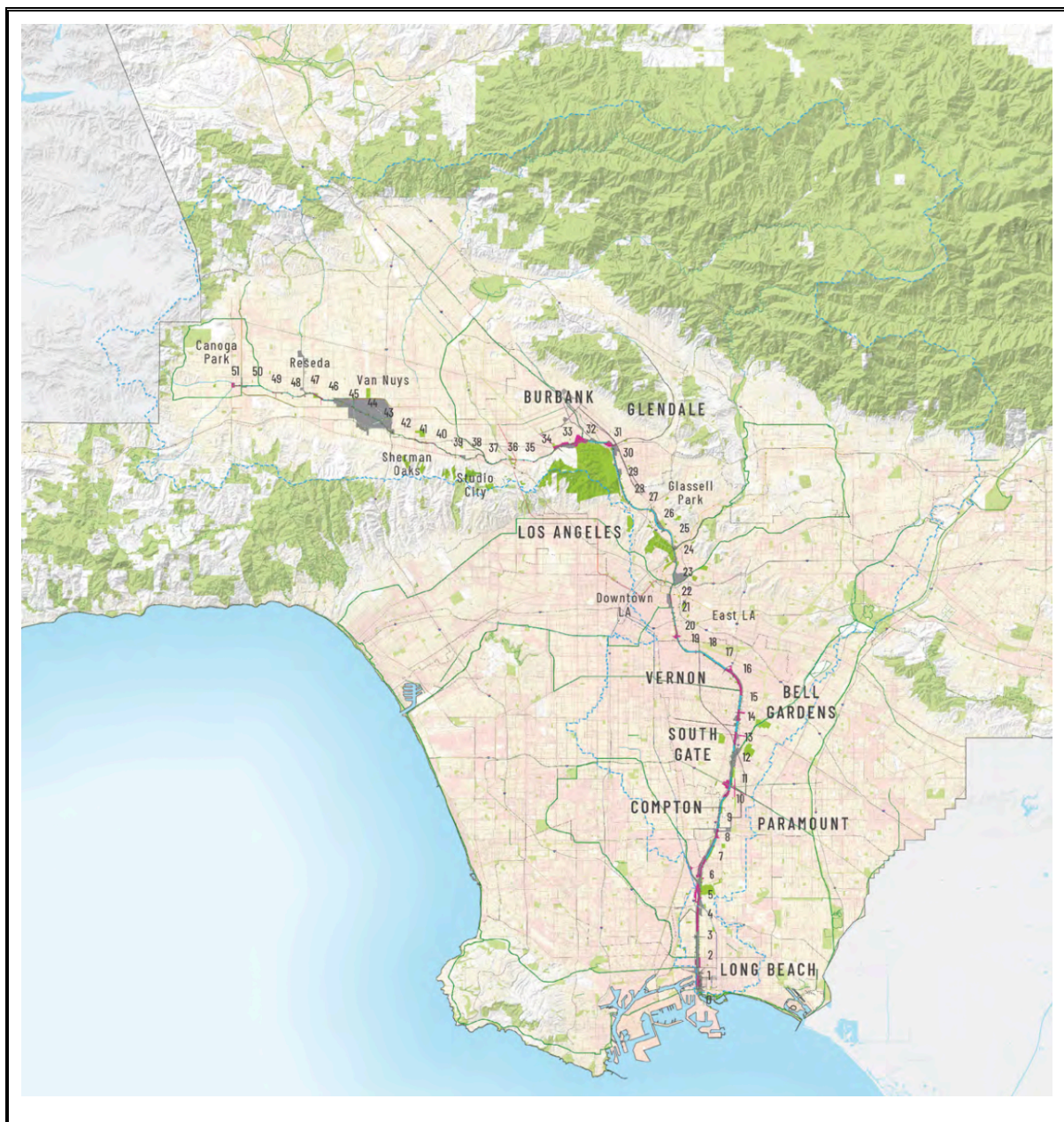


Figure 7.1: A map produced as part of the 2020 LA River Master Plan highlights the river as a reimagined transection of the county's collective space (Geosyntec et al., 2020).

Epilogue: End of the Line?

In 2021 and for the first time since record-keeping began, California recorded a net decline in population. At the time, the event was portrayed in U.S. media as a seminal shift in California's historical trajectory. It was called a "turning point" by the *L.A. Times* and a "reality check" by the *New York Times* (L.A. Times, 2021; Hubler, 2021). The libertarian Reason Foundation called the population figures "cause for concern and policy reassessment" (Joffe, 2022a); nonpartisan CalMatters called it "bad news for California" (Christopher, 2021). Almost regardless of political affiliation, the event was treated as cause for grave concern – evidence lost dynamism, a broken housing market, and the intertwined crises of homelessness and addiction. "Shrinking California Still Dreams, but More Modestly," read a typical headline of this genre (Knoll, 2023).

The declines continued for two years, until, at the end of April 2024, the California Department of Finance announced a net increase of 67,000 people living in the state (Sheets, 2024). For some, including a representative of the state itself, the increase was an inevitable return to the watchword of growth. The *L.A. Times* quoted Department of Finance spokesperson H.D. Palmer: "The brief period of California's population decline is over ... We're back, and we're returning to a rate of steady, stable growth" (Sheets, 2024). "So much for claims of the state's demise," wrote one *L.A. Times* columnist, "It was bound to end. This is California, after all. Losing population defies our history" (Skelton, 2024).

Whether population loss defies California's history is one question; whether it defines its future is another. What is more certain is that however small, divergent, and short the decline was made out to be in the California imagination, the intrusive thought that California might not grow forever has already started to be embedded in the map. The decline first redrew the political map of the United States, as California lost one of its congressional representatives to the booming states of the southeastern Sun Belt. Although retaining by far its title as the country's largest state, a status it has enjoyed since the early 1960s, California may have already passed the apex of its national political influence. Consequently, the state electoral map also had to be redrawn, reconfiguring fifty-three congressional districts into fifty-two. Federal funding for everything from healthcare to food stamps shrank proportionately, changing the scale and distribution of socioeconomic hardship. And most importantly to this thesis, in matters of transportation, the decline led to diminished federal highway funding and renewed calls to scale back or cancel the beleaguered California High-Speed Rail (Joffe, 2022b; Vartabedian, 2023). The urban coalition that had spent more than a generation organizing itself to reconfigure California's north-south map has largely failed to do so, and now they may have missed their chance.

California's map has been imagined and re-imagined through politics of cartography and the cartographies of politics. The imaginative power of maps has repeatedly reaffirmed this process, as setting cartographic expectations has helped organize coalitions to conquer geographic reality. But recently, geographic reality has seemed to rebel against its would-be conquerors, resisting across theaters of climate, housing, health, and population. Attendant crises of confidence have manifested in crises of cartography. California's century of realizing ambitious maps of the future has veered off track as the High-Speed Rail has lost political traction over the immense cost of traversing the same mountain passes that shattered Charles Blaney's windshield one hundred years ago.

Whether that train ever reaches the urbanites who voted for it, or whether it remains in the Central Valley as an edifice of their failure to realize the latest in a long line of California cartographic imaginaries, will signal whether or not the state's protracted history of making believable maps, and making maps believable, has turned into pure make believe.

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