University Transportation Research Center - Region 2

Final Report

Streetcar Projects as Spatial Planning: A Shift in Transport Planning in the United States

Performing Organization: Columbia University

February 2016

Sponsor:
University Transportation Research Center - Region 2

University Transportation Research Center - Region 2

The Region 2 University Transportation Research Center (UTRC) is one of ten original University Transportation Centers established in 1987 by the U.S. Congress. These Centers were established with the recognition that transportation plays a key role in the nation's economy and the quality of life of its citizens. University faculty members provide a critical link in resolving our national and regional transportation problems while training the professionals who address our transportation systems and their customers on a daily basis.

The UTRC was established in order to support research, education and the transfer of technology in the field of transportation. The theme of the Center is "Planning and Managing Regional Transportation Systems in a Changing World." Presently, under the direction of Dr. Camille Kamga, the UTRC represents USDOT Region II, including New York, New Jersey, Puerto Rico and the U.S. Virgin Islands. Functioning as a consortium of twelve major Universities throughout the region, UTRC is located at the CUNY Institute for Transportation Systems at The City College of New York, the lead institution of the consortium. The Center, through its consortium, an Agency-Industry Council and its Director and Staff, supports research, education, and technology transfer under its theme. UTRC's three main goals are:

Research

The research program objectives are (1) to develop a theme based transportation research program that is responsive to the needs of regional transportation organizations and stakeholders, and (2) to conduct that program in cooperation with the partners. The program includes both studies that are identified with research partners of projects targeted to the theme, and targeted, short-term projects. The program develops competitive proposals, which are evaluated to insure the mostresponsive UTRC team conducts the work. The research program is responsive to the UTRC theme: "Planning and Managing Regional Transportation Systems in a Changing World." The complex transportation system of transit and infrastructure, and the rapidly changing environment impacts the nation's largest city and metropolitan area. The New York/New Jersey Metropolitan has over 19 million people, 600,000 businesses and 9 million workers. The Region's intermodal and multimodal systems must serve all customers and stakeholders within the region and globally.Under the current grant, the new research projects and the ongoing research projects concentrate the program efforts on the categories of Transportation Systems Performance and Information Infrastructure to provide needed services to the New Jersey Department of Transportation, New York City Department of Transportation, New York Metropolitan Transportation Council , New York State Department of Transportation, and the New York State Energy and Research Development Authorityand others, all while enhancing the center's theme.

Education and Workforce Development

The modern professional must combine the technical skills of engineering and planning with knowledge of economics, environmental science, management, finance, and law as well as negotiation skills, psychology and sociology. And, she/he must be computer literate, wired to the web, and knowledgeable about advances in information technology. UTRC's education and training efforts provide a multidisciplinary program of course work and experiential learning to train students and provide advanced training or retraining of practitioners to plan and manage regional transportation systems. UTRC must meet the need to educate the undergraduate and graduate student with a foundation of transportation fundamentals that allows for solving complex problems in a world much more dynamic than even a decade ago. Simultaneously, the demand for continuing education is growing – either because of professional license requirements or because the workplace demands it – and provides the opportunity to combine State of Practice education with tailored ways of delivering content.

Technology Transfer

UTRC's Technology Transfer Program goes beyond what might be considered "traditional" technology transfer activities. Its main objectives are (1) to increase the awareness and level of information concerning transportation issues facing Region 2; (2) to improve the knowledge base and approach to problem solving of the region's transportation workforce, from those operating the systems to those at the most senior level of managing the system; and by doing so, to improve the overall professional capability of the transportation workforce; (3) to stimulate discussion and debate concerning the integration of new technologies into our culture, our work and our transportation systems; (4) to provide the more traditional but extremely important job of disseminating research and project reports, studies, analysis and use of tools to the education, research and practicing community both nationally and internationally; and (5) to provide unbiased information and testimony to decision-makers concerning regional transportation issues consistent with the UTRC theme.

Project No(s):
UTRC/RF Grant No: 49198-22-26

Project Date: February 2016

Project Title: Streetcar Projects as Spatial Planning: A Shift in Transport Planning in the United States

Project's Website:
http://www.utrc2.org/research/projects/streetcar-projects-spatial-planning

Principal Investigator(s):
David King
Assistant Professor
Graduate School of Architecture, Planning and Preservation
Columbia University
New York, NY 10027
Email: dk2475@columbia.edu

Researcher:
Lauren Ames Fischer
Graduate School of Architecture, Planning and Preservation
Columbia University
New York, NY 10027

Performing Organization(s):
Columbia University

Sponsor(s):
University Transportation Research Center (UTRC)

To request a hard copy of our final reports, please send us an email at utrc@utrc2.org

Mailing Address:

University Transportation Reserch Center
The City College of New York
Marshak Hall, Suite 910
160 Convent Avenue
New York, NY 10031
Tel: 212-650-8051
Fax: 212-650-8374
Web: www.utrc2.org

Board of Directors

The UTRC Board of Directors consists of one or two members from each Consortium school (each school receives two votes regardless of the number of representatives on the board). The Center Director is an ex-officio member of the Board and The Center management team serves as staff to the Board.

City University of New York
Dr. Robert E. Paaswell - Director Emeritus of NY
Dr. Hongmian Gong - Geography/Hunter College

Clarkson University
Dr. Kerop D. Janoyan - Civil Engineering

Columbia University
Dr. Raimondo Betti - Civil Engineering
Dr. Elliott Sclar - Urban and Regional Planning

Cornell University
Dr. Huaizhu (Oliver) Gao - Civil Engineering
Dr. Richard Geddess - Cornell Program in Infrastructure Policy

Hofstra University
Dr. Jean-Paul Rodrigue - Global Studies and Geography

Manhattan College
Dr. Anirban De - Civil & Environmental Engineering
Dr. Matthew Volovski - Civil & Environmental Engineering

New Jersey Institute of Technology
Dr. Steven I-Jy Chien - Civil Engineering
Dr. Joyoung Lee - Civil & Environmental Engineering

New York Institute of Technology
Dr. Nada Marie Anid - Engineering & Computing Sciences
Dr. Marta Panero - Engineering & Computing Sciences

New York University
Dr. Mitchell L. Moss - Urban Policy and Planning
Dr. Rae Zimmerman - Planning and Public Administration

(NYU Tandon School of Engineering)
Dr. John C. Falcocchio - Civil Engineering
Dr. Kaan Ozbay - Civil Engineering
Dr. Elena Prassas - Civil Engineering

Rensselaer Polytechnic Institute
Dr. José Holguín-Veras - Civil Engineering
Dr. William "Al" Wallace - Systems Engineering

Rochester Institute of Technology
Dr. James Winebrake - Science, Technology and Society/Public Policy
Dr. J. Scott Hawker - Software Engineering

Rowan University
Dr. Yusuf Mehta - Civil Engineering
Dr. Beena Sukumaran - Civil Engineering

State University of New York
Michael M. Fancher - Nanoscience
Dr. Catherine T. Lawson - City & Regional Planning
Dr. Adel W. Sadek - Transportation Systems Engineering
Dr. Shmuel Yahalom - Economics

Stevens Institute of Technology
Dr. Sophia Hassiotis - Civil Engineering
Dr. Thomas H. Wakeman III - Civil Engineering

Syracuse University
Dr. Baris Salman - Civil Engineering
Dr. O. Sam Salem - Construction Engineering and Management

The College of New Jersey
Dr. Thomas M. Brennan Jr - Civil Engineering

University of Puerto Rico - Mayagüez
Dr. Ismael Pagán-Trinidad - Civil Engineering
Dr. Didier M. Valdés-Díaz - Civil Engineering

UTRC Consortium Universities

The following universities/colleges are members of the UTRC consortium under MAP-21 ACT.

City University of New York (CUNY)
Clarkson University (Clarkson)
Columbia University (Columbia)
Cornell University (Cornell)
Hofstra University (Hofstra)
Manhattan College (MC)
New Jersey Institute of Technology (NJIT)
New York Institute of Technology (NYIT)
New York University (NYU)
Rensselaer Polytechnic Institute (RPI)
Rochester Institute of Technology (RIT)
Rowan University (Rowan)
State University of New York (SUNY)
Stevens Institute of Technology (Stevens)
Syracuse University (SU)
The College of New Jersey (TCNJ)
University of Puerto Rico - Mayagüez (UPRM)

UTRC Key Staff

Dr. Camille Kamga: *Director, Associate Professor of Civil Engineering*

Dr. Robert E. Paaswell: *Director Emeritus of UTRC and Distin*guished Professor of Civil Engineering, The City College of New York

Dr. Ellen Thorson: *Senior Research Fellow*

Penny Eickemeyer: *Associate Director for Research, UTRC*

Dr. Alison Conway: *Associate Director for Education/Associate Professor of Civil Enginering*

Nadia Aslam: *Assistant Director for Technology Transfer*

Nathalie Martinez: *Research Associate/Budget Analyst*

Andriy Blagay: *Graphic Intern*

Tierra Fisher*: Office Manager*

Dr. Sandeep Mudigonda, *Research Associate*

Dr. Rodrigue Tchamna, *Research Associate*

Dr. Dan Wan, *Research Assistant*

Bahman Moghimi*: Research Assistant;*
Ph.D. Student, Transportation Program

Sabiheh Fagigh*: Research Assistant;*
Ph.D. Student, Transportation Program

Patricio Vicuna*: Research Assistant*
Ph.D. Candidate, Transportation Program

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No.	2.Government Accession No.	3. Recipient's Catalog No.

4. Title and Subtitle	5. Report Date
Streetcar projects as spatial planning: A shift in transport planning in the United States	February 2016
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.
David King	Columbia University

9. Performing Organization Name and Address	10. Work Unit No.
Columbia University New York, NY 10027	11. Contract or Grant No. 49198-22-26

12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
University Transportation Research Center 160 Convent Avenue, Marshak 910 New York, NY 10031	14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

Currently dozens of U.S. cities are in the midst of planning and building modern streetcar systems. Though seemingly mobility investments, the intended impacts of these streetcar projects reach beyond transportation and represent a strong turn toward strategic spatial planning through transportation infrastructure. Proponents of modern streetcars argue that they are tools of place making as much as if not more than improvements for transit services. Unlike transit investments of a century ago, when privately operated streetcars were a decentralizing force that helped disperse overcrowded central city cores and open new land for real estate development, current streetcar projects in the United States are expected to concentrate activity and economic development in select corridors. The majority of these new systems rely on transit technologies that are significantly improved over the carriages of old, with modern features, smooth rides and quiet operations. Yet for all the improvements to the vehicles and services, new streetcar investments no longer primarily improve transit accessibility. Rather, modern streetcars are part of strategic amenity packages cities use to achieve real estate and economic development goals. This use of transportation infrastructure as an amenity for a particular location is a shift away from traditional transportation planning processes, and the expected benefits, in particular, stand apart as being deliberately spatial. We use planning documents and data from ballot box initiatives to evaluate expected transportation benefits relative to indirect benefits through economic development. We find that approximately three quarters of all expected benefits from streetcar projects accrue to property development with the remaining expected benefits assigned to transportation. However, we do not find sufficient empirical evidence in the literature to support such certain claims of positive effects on property values and the built environment. We argue that the increasing tendency of cities to leverage streetcar projects for non-transportation purposes represents a turn to the use of infrastructure as a tool of spatial planning.

17. Key Words	18. Distribution Statement

19. Security Classif (of this report)	20. Security Classif. (of this page)	21. No of Pages	22. Price
Unclassified	Unclassified	8	

Form DOT F 1700.7 (8-69)

Disclaimer

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the information presented herein. The contents do not necessarily reflect the official views or policies of the UTRC or the Federal Highway Administration. This report does not constitute a standard, specification or regulation. This document is disseminated under the sponsorship of the Department of Transportation, University Transportation Centers Program, in the interest of information exchange. The U.S. Government assumes no liability for the contents or use thereof.

Journal of Transport Geography xxx (2016) xxx–xxx

Contents lists available at ScienceDirect

Journal of Transport Geography

journal homepage: www.elsevier.com/locate/jtrangeo

Streetcar projects as spatial planning: A shift in transport planning in the United States

David A. King *, Lauren Ames Fischer

Graduate School of Architecture, Planning and Preservation, 400 Avery Hall, MC 0356, 1172 Amsterdam Avenue, Columbia University, New York, NY 10027, United States

ARTICLE INFO

Article history:
Received 15 May 2015
Received in revised form 10 February 2016
Accepted 11 February 2016
Available online xxxx

Keywords:
Spatial planning
Streetcars
Voter referendum
Economic development
Placemaking

ABSTRACT

Currently dozens of U.S. cities are in the midst of planning and building modern streetcar systems. Though seemingly mobility investments, the intended impacts of these streetcar projects reach beyond transportation and represent a strong turn toward strategic spatial planning through transportation infrastructure. Proponents of modern streetcars argue that they are tools of placemaking as much as if not more than improvements for transit services. Unlike transit investments of a century ago, when privately operated streetcars were a decentralizing force that helped disperse overcrowded central city cores and open new land for real estate development, current streetcar projects in the United States are expected to concentrate activity and economic development in select corridors. The majority of these new systems rely on transit technologies that are significantly improved over the carriages of old, with modern features, smooth rides and quiet operations. Yet for all the improvements to the vehicles and services, new streetcar investments no longer primarily improve transit accessibility. Rather, modern streetcars are part of strategic amenity packages cities use to achieve real estate and economic development goals. This use of transportation infrastructure as an amenity for a particular location is a shift away from traditional transportation planning processes, and the expected benefits, in particular, stand apart as being deliberately spatial. We use planning documents and data from ballot box initiatives to evaluate expected transportation benefits relative to indirect benefits through economic development. We find that approximately three-quarters of all expected benefits from streetcar projects accrue to property development with the remaining expected benefits assigned to transportation. However, we do not find sufficient empirical evidence in the literature to support such certain claims of positive effects on property values and the built environment. We argue that the increasing tendency of cities to leverage streetcar projects for non-transportation purposes represents a turn to the use of infrastructure as a tool of spatial planning.

1. Introduction

Modern streetcars are hailed as catalysts for local economic development, improved pedestrian environments, enhanced transit service, as well as improved livability and quality of life in the corridors served. Most of the proposed and existing U.S. systems are short (generally less than 10 km), individual lines that serve commercial districts and downtown areas on tracks in mixed-traffic. These systems are distinct from light rail and other transit systems which tend to utilize dedicated rights of way, span longer distances and make infrequent stops. The National Transit Database (NTD) of the United States defines streetcars as "rail systems operating routes predominately on streets in mixed-traffic. This service typically operates with single-car trains powered by overhead catenaries with frequent stops" (Federal Transit Administration, 2014). Streetcar systems also vary in their design characteristics. Some are historical throwbacks (i.e. Little Rock, AR; Memphis, TN; Tampa, FL) and others offer sleek new trains (i.e. Salt Lake City, UT; Seattle, WA; Portland, OR). Some have integrated their fare payment systems with local transit agencies (i.e. Portland, OR; Cincinnati, OH) while others provide rides free of charge (Atlanta, GA; Kansas City, MO). Some system are owned and operated by local transit agencies (i.e. Salt Lake City, UT; Dallas, TX) while others belong to the city or non-profit organizations (i.e. Portland, OR; Kansas City, MO; Atlanta, GA). Overall the contemporary experience of U.S. streetcars is as varied as the cities they serve. Despite these differences, streetcar investments consistently invoke spatial planning and are justified with the expectation of increased land value and property development benefits.

Using infrastructure to achieve strategic planning goals is an idea that has come around before (Neuman and Smith, 2010), but currently is part of a global trend (Dodson, 2009). Specifically to transit, infrastructure has been used very differently over time based on changing needs and competition. For instance, over a century ago streetcar transit technologies helped usher in an era of decentralized suburbanization and speculative land development (Warner, 1962; Divall and Bond, 2003; Xie and Levinson, 2010). While speculative development is still active, transit technologies—including streetcars—are no longer a

* Corresponding author.
E-mail address: dk2475@columbia.edu (D.A. King).

http://dx.doi.org/10.1016/j.jtrangeo.2016.02.005
0966-6923/

decentralizing force. This historical role of streetcar development contrasts with the effects streetcars are expected to have today in U.S. cities, where they are promoted as a centralizing force that attracts households, businesses and development back to the center of cities.

In this paper we are concerned with whether streetcar projects have been used as a form of spatial planning at the expense of integrated transportation planning. To isolate the spatial planning components we evaluate direct transportation effects of recent streetcar projects and examine the way these projects are funded and in some cases sold to the voters. We argue that one way streetcar projects embody strategic spatial planning is in their isolation from other long-range planning efforts of city and regional agencies, especially transit providers. This paper is organized as follows. The next section describes the recent popularity of modern streetcars and elaborates on the argument that these projects are examples of strategic spatial planning. We then provide a brief review of the relevant literature, followed by descriptions of current and proposed streetcar projects. In the analysis section we use data from the Federal Transit Administration (FTA) Small Starts and U.S. Department of Transportation's Transportation Investment Generating Economic Recovery (TIGER) programs to evaluate proposed benefits from federally supported streetcar projects, followed by discussion and concluding remarks.

2. Strategic spatial planning through transport infrastructure

We argue that modern streetcar projects are best understood as a turn toward strategic spatial planning in U.S. cities, marking a move away from integrated approaches to transportation policy. Strategic spatial planning refers to a planning and policy process applied to a specific geographic area or territory (Healey et al., 1999) and is a term more commonly used in European planning than in the United States. This approach differs from traditional urban planning efforts by purposefully combining various functional or sectorial priorities (such as mass transportation and economic development policy) into a single framework. Spatial planning involves setting frameworks and principles to guide the location of development and physical infrastructure as well as developing a set of governance practices for developing and implementing strategies, plans, policies and projects for regulating the location, timing and form of development (Healey et al., 1999). In contrast to traditional urban planning processes, spatial planning is a deliberate effort by local governments or territorially-based policy communities to take place-shaping seriously.

Given the strong role that spatial planning has on framing mindsets and organizing attention, it is important to ask who the vision benefits and who it excludes, as well as to investigate the major assumptions promoted by the policy framework (Olesen, 2014). One of the underlying assumptions of modern streetcar projects is that public transport investments can and should enhance private land values. Land value benefits are then combined with claims about typical transportation-related impacts of enhanced travel options and environmental sustainability to estimate the overall value of streetcar projects. Despite the plethora of effects promoted by streetcar proponents, the land development claim remains the most explicitly invoked and is often emphasized over other benefits. Indeed, many streetcar systems' capital and operational funding relies on taxation schemes predicated on increased land values and property development benefits. Such a framework aligns with spatial planning strategies in European countries which are increasingly guided by a narrow policy agenda that seeks to install economic growth and competitiveness as common-sense policy objectives (Purcell, 2009; Allmendinger and Haughton, 2012).

The ability of streetcars to attract new activity and encourage new development is not unambiguously supported by empirical evidence. Scholars have examined how streetcars function as transit systems (Brown, 2013) and provided mixed evidence of the economic development potential of streetcar projects (Golem and Smith-Heimer, 2010). A major assumption underlying transport infrastructure as a catalyst of development is that transportation will affect land development through accessibility improvements (Hansen, 1959). However, in areas where the transport infrastructure stock is mature, even sizable investments are unlikely to produce much economic development (Banister and Berechman, 2001). Furthermore, the overall relationship between transport and land use may be weakening (Giuliano, 1995), though this claim is also disputed (Cervero and Landis, 1995).

Looking at specific policies aimed to facilitate transit-oriented development formidable social, economic, institutional barriers are difficult to overcome but critical for success (Cervero et al., 2004; Curtis et al., 2009). These barriers include, most notably, local land use regulations. Ignoring these barriers will inhibit development around transit stations (Loukaitou-Sideris and Banerjee, 2000), regardless of accessibility improvements. Other research suggests that rail investment alone is insufficient to produce benefits, and that appropriate local government policies, supportive zoning and effective planning implementation tools must be in place for development to occur near stations (Knight and Trygg, 1977; Cervero, 1984; Gomez-Ibanez, 1985; Cervero and Landis, 1995). These empirical realities raise concerns about the ability of modern streetcar investments alone to produce the development benefits being relied upon to fund and justify the public investments. Other local policies are just as, if not more, important for achieving development goals.

An open question then is why do cities favor complex and costly infrastructure investments over changes in local land use or social policy as a critical tool to achieve local planning goals? The answer, in part, is explained through the way modern streetcar projects are funded. Capital subsidies are administered through a variety of Federal Transit Administration programs, including Small Starts and TIGER, and are predicated on local financial matches (Mallett, 2014). These projects are often pursued by consortia of businesses and public officials rather than current transit operators or transportation planning agencies. Though operating costs must be covered through fares and local contributions, in many cases transit operators and fare policies are not decided until the streetcars are almost completed, such as in Atlanta, GA (Shapiro 2013). There is a split between decisions to build streetcar infrastructure and obligations associated with operations. As we explore later, focusing on streetcars independently of operations demonstrates an attitude that infrastructure is far more important than service for shaping cities.

3. Historical context

Streetcars have a long history in the United States and were instrumental in shaping the urban form of many cities over a century ago (Warner, 1962). In the late 19th Century, streetcars and other passenger rail systems provided a dramatic improvement in passenger travel and were rapidly adopted by cities across the country (Garrison and Levinson, 2006). At the time rail transit technologies helped reshape cities by promoting decentralization along specific corridors as well as opening up new land for development (Divall and Bond, 2003; Levinson, 2008a, 2008b; Xie and Levinson, 2010; King, 2011). In fact, most streetcar companies made most of their profits off land development or utility extensions rather than fare boxes (Jones, 1985). Because of shaky finances, many systems went bankrupt or were forced to reorganize their finances prior to the Great Depression. By the middle part of last century, privately operated streetcar systems were suffering from urban disinvestment, competition with automobiles and fiscal arrangements that left systems in fatal decline (Jones, 1985, 2008). By the 1960s nearly all mixed traffic streetcar systems had been dismantled.

In the modern era of streetcar building (i.e. the last few decades) project proponents often conflate the historical transformative effect of streetcars with their potential to remake cities today. As discussed above, the evidence for transport investment spurring local economic growth is equivocal (Banister and Berechman, 2001; Levinson and Zhang, 2006), and new development may be more strongly related to

Please cite this article as: King, D.A., Fischer, L.A., Streetcar projects as spatial planning: A shift in transport planning in the United States, Journal of Transport Geography (2016), http://dx.doi.org/10.1016/j.jtrangeo.2016.02.005

Table 1
U.S. streetcar systems projects by status (as of October 2015).

Operating (12)	Under construction (6)	Planned (11)	Proposed (23)	Suspended/cancelled (6)
Atlanta, GA	Charlotte, NC (Gold Line)	Austin, TX	Albuquerque, NM	Arlington, VA (Columbia Pike)
Dallas, TX (McKinney Ave Extsn)	Cincinnati, OH	Fort Lauderdale, FL	Baltimore, MD (Charles St)	Arlington, VA (Crystal City)
Dallas, TX (Oak Cliff-Downtown)	Detroit, MI (M-1)	Los Angeles, CA (Downtown)	Boise, ID	Columbus, OH
Dallas, TX (McKinney Ave)	Kansas City, MO	Oklahoma City, OK	Charlotte, NC (Gold Line Phase 2)	Fort Worth, TX
Kenosha, WI	Seattle, WA (First Hill)	Providence, RI	Charlottesville, VA	Miami, FL
Little Rock, AR (River Rail)	Wash. DC (H Street-Benning Rd)	San Antonio, TX	Colorado Springs, CO	Portland (Lake Oswego)
Memphis, TN		Santa Ana, CA	Denver, CO (Colfax Ave)	
Portland, OR		St Louis, MO (Delmar Loop)	Grand Rapids, MI	
Salt Lake City, UT (S Line)		St Louis, MO (Downtown)	Hampton Roads, VA	
Seattle, WA (South Lake Union)		Tempe, AZ	Indianapolis, IN	
Tampa, FL (TECO)		Washington DC (Green Line Extsn)	Kansas City, MO (Phase 2)	
Tucson, AZ (Sun Link)			Milwaukee, WI	
			Minneapolis, MN (Nicollet-Central)	
			New Haven, CT	
			Oakland, CA	
			Omaha, NE	
			Reno, NV	
			Riverside, CA	
			Sacramento, CA	
			San Diego, CA (City-Park)	
			St Paul, MN	
			Stamford, CT	
			Winston-Salem, NC	

"Under construction" includes utility relocation, track placement or other major public works projects specifically related to the streetcar.
"Planned" refers to projects that have an estimated service start date but have not yet started construction.
"Proposed" refers to projects that are undergoing formal review and evaluation, including decisions related to transport mode and location, but that do not yet have an estimated start date.

zoning changes or other types of development incentives than to specific infrastructure investments (Golem and Smith-Heimer, 2010). As much of the literature on transit oriented development has focused on commuter rail or light rail (Urban Land Institute and Gladstone Associates, 1979; Boarnet and Compin, 1999; Bollinger and Ihlanfeldt, 1997; Banister and Berechman, 2001; Cervero et al., 2004) it is not clear how well these analyses transfer to mixed-traffic streetcars designed to act as "pedestrian accelerators" (Owen, 2011). There is good reason to be cautious, however, as scholars have argued that transit-oriented development can "only attract the necessary development potential…if they are linked by fast transit" (Newman, 2009), providing a challenge for streetcar systems which tend to operate at relatively slow speeds. In addition, streetcars projects should heed the caution that using resources for transport investment predicated on future economic benefits may jeopardize the fiscal health of local governments (Helling, 1997).

4. Current streetcar projects

There are currently 12 operating streetcar systems and between 15 and 36 systems in the planning or proposal stage. Table 1 shows the systems by stage of operation or planning. The most famous streetcar project (in academic and professional circles) is located in Portland, Oregon and is often evoked as the gold standard for how streetcars can transform a city (Golem and Smith-Heimer, 2010). Notably, however, officials in Portland contend that development subsidies and other incentives provided to the private real estate community had a greater impact on property development near the streetcar than the streetcar investment itself (Weiner, 2014), suggesting that the more appropriate lesson from the Portland experience is about subsidizing development and coordinating land use policies rather than simply building a streetcar.

Modern streetcar systems vary widely in service levels and type. A few of the systems are little more than historic trolleys that service tourist populations.[1] Others, especially the Portland system, were conceived of and designed as part of the overall transit network. Integration with existing transit agencies is not common for streetcar systems, many of which are promoted by local business associations, such as the Atlanta Downtown Improvement District. From a local economic development perspective, the involvement of downtown leaders and businesses as project initiators and supporters helps focus economic investment. Yet from a transportation perspective the strong role of local business coalitions can challenge project implementation or divert transportation resources away from regional priorities such as congestion mitigation or improved regional accessibility.

In many cities the streetcar operator remains undefined until shortly before operations are scheduled to commence; the selected operators do not always have experience operating transit systems and may be start-up organizations. In Atlanta the regional transit agency (MARTA) ruled themselves out as a potential operator a few months before the system was to open (Shapiro, 2013). The Atlanta situation is not unusual and such arrangements can hinder the ability to coordinate streetcar investments with existing transportation services, as well as precluding cross-subsidization of bus services with streetcar profits. When transit agencies are not central to promoting and planning streetcars the systems may not reflect and may even contradict regional transit priorities.

5. Data

The data used in this paper were collected from a variety of online and print materials produced by both the academic and professional sectors. The operating, planned and proposed streetcar systems across the United States were identified and publicly available published materials were collected for each of the projects. In identifying streetcar projects, we relied on the FTA definition of streetcars as fixed rail projects with frequent stops (about every 500 m), a shared right of way and a concentrated service area (i.e. circulator, not long haul travel). We excluded projects that do not run on fixed rail (i.e. San Pedro, CA Downtown Trolley), and those that only provide seasonal or weekend service (i.e. River St Streetcar in Savannah, GA; Historic Trolley in Lowell, MA). We also excluded streetcars that were historically integrated with regional mass transit providers, such as Boston's Massachusetts Bay Transportation Authority (MBTA), Philadelphia's Southeastern Pennsylvania Transportation Authority (SEPTA) and San Francisco's MUNI, as these system represent historic investments and are not

[1] An example of private trolley system is Caruso Affiliated's Grove shopping complex in Los Angeles. On the webpage for this facility the private developer states: "It all started with a trolley." Caruso Affiliated. "The Grove." Retrieved July 24, 2014, from http://www.carusoaffiliated.com/caruso/development/property.php?id_property=2.

Please cite this article as: King, D.A., Fischer, L.A., Streetcar projects as spatial planning: A shift in transport planning in the United States, Journal of Transport Geography (2016), http://dx.doi.org/10.1016/j.jtrangeo.2016.02.005

representative of the "new investment systems" we argue are indicative of spatial planning efforts. The streetcar in Tacoma, WA was also excluded; although it uses the same technology as the Portland streetcar it is treated like a light rail system by its owner-operator, Sound Transit.

Projects were identified through multiple sources, including federal databases and documents from the 2013 Streetcar Summit hosted by the Streetcar Coalition. The current status of each project and descriptive system details were collected through websites maintained by the local streetcar providers, downtown coalitions and city governments for each project. Additional information on funding and ballot initiatives was collected from local election boards and media sources. Information on TIGER grants was collected from the TIGER website maintained by the federal DOT, as well as the websites of local government agencies that submitted TIGER applications.

5.1. Service characteristics for existing streetcars

Fundamentally, transportation investments shape land uses through changes in accessibility (Hansen, 1959) but rail investments are also thought to attract economic activity by signaling a public sector commitment to a particular geographic area (Helling, 1997). It then follows that if economic development occurs around streetcar investments, the causal explanations are either related to improved access provided by better transit service, or by the non-transport related value that attracts firms and households by signaling public sector commitment to improving the public amenities in a specific area. In this section we evaluate the transportation improvements associated with select streetcar projects. Projects were selected to be representative of the current generation of initiatives and for which data was available. Table 2 provides an overview of the transit service characteristics of existing streetcar systems, extending 2008–2011 data from Jeffrey Brown's examination of the transit effects of streetcars (Brown, 2013). Service characteristics are evaluated using common metrics of vehicle revenue miles and vehicle revenue hours.

The seven systems show mixed results for changes in service levels, but in general service levels increased between 2008 and 2013. Memphis operates an historic streetcar that is undergoing renovations, perhaps explaining why service was cut so severely during this period. Seattle, which operates its streetcars as part of their integrated transit system, expanded streetcar service slightly—an expected outcome for a system that provides robust transit connections in an area experiencing growth pressures. Portland, which as previously mentioned is the standard for streetcars affecting economic development, increased revenue miles but reduced revenue hours.

In Table 3 the operating costs for 2010 and 2013 are shown, with total costs representing annual operating expenses. As streetcar trips tend to be relatively short the costs per unlinked passenger trip (UPT) and per passenger mile (PM) are similar for systems where the average trip distance is about a mile. Memphis and Tampa both reduced operating costs between 2010 and 2013, but these cities also reduced service. For the cities that increased streetcar service, operating costs per trip and per mile also increased. This highlights how an increase in subsidized service leads to an increase in operating expenses—the opposite of what we would expect in a system financially constrained by its fare box revenue. Operating budgets are made worse off, and operating costs are substantially higher than bus services in the same cities (Brown, 2013). The tables also highlight the large differences in UPT and PM expenses across streetcar systems.

It is common for streetcar advocates to say that developers like the permanence of rails as a key feature of why streetcar projects spur development. Unfortunately the permanence of rails doesn't lead to the permanence of service, and the evidence on actual transit service from streetcars is mixed at best. The takeaway from these tables is that streetcars as transportation projects are not unambiguously successful. These systems are expensive to operate, which has led to many systems curtailing service, either as a reaction to slack demand or because of high operating costs. To sum, modern streetcar systems do not produce clear transportation benefits (although some of the systems do meet this standard), which can jeopardize the continued provision of high quality future service. This affects the way that streetcar projects are analyzed and financed. We turn to these issues in the following section.

Table 2
Annual service on U.S. streetcars operated in regular revenue service (2008–2013).

City	2008	2009	2010	2011	2012	2013	% change
Vehicle revenue miles							
Little Rock	38,381	37,696	52,687	42,063	54,573	51,874	35%
Memphis	412,765	362,410	298,763	294,536	324,511	275,026	−33%
New Orleans	765,815	816,890	947,790	926,132	822,006	865,299	13%
Portland	216,308	210,362	173,714	170,530	248,772	*	
Seattle	56,904	60,150	59,964	61,727	62,222	63,268	11%
Tacoma	94,189	89,427	90,195	82,565	75,896	76,028	−19%
Tampa	80,045	73,114	71,067	74,714	67,507	66,692	−17%
Vehicle revenue hours							
Little Rock	8,669	8,481	11,904	9,417	12,428	11,667	35%
Memphis	59,210	56,790	48,797	39,612	43,440	38,180	−36%
New Orleans	94,461	102,439	122,586	127,472	123,596	145,229	54%
Portland	38,047	37,001	30,555	29,995	*	*	
Seattle	11,077	11,207	11,174	11,509	11,736	11,905	7%
Tacoma	9,708	9,424	9,727	9,818	9,822	9,840	1%
Tampa	15,713	14,246	13,805	14,077	12,542	12,398	−21%

Source: National Transit Database.
In 2012 Portland changed their reporting standards to the National Transit Database so alternate data sources were used where available. The * denotes that data are unavailable through the National Transit Database.

5.2. Cost benefit analyses for proposed systems

The U.S. Department of Transportation TIGER grant application process requires that proposed projects include a cost benefit analysis (CBA). The Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant program was created in 2009 in part to aid in the national economic recovery. The program administers hundreds of millions of dollars annually through a competitive application process. Of the approximately $866 million spent on U.S. streetcars between 2009 and 13 $279 million, 32% was federal support through TIGER grants. Projects are scored in part based on their national economic benefits, and in part based on the ability of localities to raise matching funds. As discussed in the previous section, transportation benefits from streetcar projects are uncertain, which is reflected in the project analyses. Based on the ratio of expected benefits presented in Table 4, approximately three-quarters of all proposed streetcar benefits derive from economic development. Not only are these economic development benefits presented with a degree of certainty, the majority are calculated as property value increases which accrue to private owners.

Proposed benefits from streetcar projects are large and offer high rates of return, even with high discount rates. For instance, the Cincinnati Streetcar CBA expects an internal rate of return of 6.5% (HDR, 2011). Cincinnati's TIGER application (prepared by HDR

Table 3
Operating expenses of US streetcars in regular revenue service (2010 and 2013).

City	2010			2013		
	Total	Per UPT	Per PM	Total	Per UPT	Per PM
Little Rock	$1,024,033	$9.56	$6.18	$1,062,877	$11.49	$7.36
Memphis	$4,208,069	$3.85	$4.58	$4,440,780	$3.02	$3.70
New Orleans	$24,248,078	$4.09	$1.58	$24,194,618	$3.35	$1.76
Portland	$5,500,000	$1.39	N/A	$11,868,085	$3.24	$3.18
Seattle	$2,318,808	$4.45	$4.92	$2,794,211	$3.72	$4.30
Tacoma	$3,150,604	$3.63	$3.62	$4,169,997	$4.07	$4.79
Tampa	$2,583,860	$5.38	$3.27	$1,418,468	$4.79	$2.75

Source: National Transit Database.

Please cite this article as: King, D.A., Fischer, L.A., Streetcar projects as spatial planning: A shift in transport planning in the United States, Journal of Transport Geography (2016), http://dx.doi.org/10.1016/j.jtrangeo.2016.02.005

Table 4
Projects receiving TIGER grants for streetcar capital investment.

				CBA project estimates	
	$ (millions)	Year	Program	Ratio of economic development/transport benefits	% total benefits from economic development
Tucson	63.0	2009	TIGER I	29.3	71%
Atlanta	47.7	2010	TIGER Capital	61.3	95%
Salt Lake City	26.0	2010	TIGER Capital	2.6	62%
Cincinnati	10.9	2011	TIGER III	7.0	78%
FT Lauderdale	18.0	2012	TIGER IV	9.8	86%
Kansas City	20.0	2013	TIGER V	18.5	79%
Average				21.4	78%

Source: "TIGER Discretionary Grants", U.S. Department of Transportation website; Streetcar project websites.

consultants) defines community development measurements as "Option value and amenity value of proposed transit alignment, as measured in property appreciation (net of capitalized travel cost savings)" (HDR, 2011). To be clear, we are not criticizing the CBA methodology conducted by HDR or other consultants; streetcar CBAs conform to prevailing sound practice and methods. Instead, we aim to highlight how benefits and costs are distributed in streetcar projects between transportation and economic development. As the data in Table 4 shows, the bulk of benefits from modern streetcar projects are economic development, which reviewed project documents show accrue primarily to property owners. This is in contrast to conventional project evaluation that highlights traveler benefits such as reduced travel times. From a cost perspective some—but not all—of the expenses are borne by the beneficiaries in cities relying on special assessments or TIF districts to fund capital and operational expenses. The extent to which these assessments will match the projected revenues is unknown, but the empirical evidence discussed earlier in this paper suggests that estimates may not match reality. The remainder of the costs for capital and operational expenses must be dispersed beyond the beneficiaries, most often though regressive sales tax schemes, general budget allocations by the city government and federal transportation grant programs. For this final category—federal transport grant programs—it is unclear how enhanced property values in select, preferred locations align with national transportation priorities related to increasing transit modal split, reducing congestion and improving environmental outcomes.

6. Presenting streetcars to voters

Transit projects in the United States are all funded through a mix of public revenue sources, though as transportation funding has devolved in recent years (Wachs, 2003), voters have been asked to approve funding for an increasing variety of transit projects. Generally voter support for transit spending is far greater than transit ridership, a phenomena that scholars have identified as a collective action problem where voters believe in the collective benefits of transit more than the individual benefits (Manville and Cummins, 2015). Yet as spatial planning tools with the main benefit of higher property values, modern streetcar projects cannot guarantee the realization of collective benefits—one firm's higher property value is another firm's higher rent. This is a challenge for streetcar supporters when presenting these projects through ballot initiatives, which are often required to secure a local match for federal grant programs.

Streetcar proposals take advantage of recent rules by the U.S. Department of Transportation that promote 'livability' as an evaluative framework as well as funding arrangements aimed at helping the national economy in the wake of the Great Recession of 2007–9. This change in guidelines, implemented in 2009, partially explains why there are more streetcar projects than in previous decades. But since federal grant programs require substantial local matching, changes to federal guidelines alone are not sufficient to explain the popularity of streetcar projects. If we look at these projects in their local contexts, what stands out are the high levels of local political support and increased political cooperation that streetcars create. Streetcar projects have broad support from a mix of real estate interests, transit advocates, environmentalists, local officials, unions and construction interests. Coalitions of interested parties that previously were adversarial are now unified in support of these projects. Likewise, some streetcar projects (i.e. Cincinnati, OH; Arlington, VA) or proposed expansions (Kansas City, MO) have engendered vigorous opposition although this often catalyzes after projects have passed the local approval stage.

There are a few reasons for broad local support. Although geographically constrained in the service they provide, streetcars have high support from the transit advocacy community, which tends to favor any project that expands access or provides alternatives to the private automobile. Unions and construction firms support large job-creating programs, whatever they may be, while streetcars locations in larger central business districts helps leverage support from many employers and elected officials. More critically, though, the opportunity costs of joining a pro-streetcar coalition are very low. While core proponents such as a Business Improvement District or single purpose advocacy group have a lot invested in the success of streetcars, for most other actors there are few reasons not to support an application for federal funds.

Local benefits do offer opportunities for closely tying infrastructure finance with development through value capture (Hagman and Misczynski, 1978; Smith and Gihring, 2006) or local taxes. Most often—albeit based on state regulations—the approval of such taxation schemes is presented to voters through a ballot initiative. We identified eleven streetcars projects that were at least partially funded with taxes approved through local ballot initiatives, which are described in Table 5. In all but the Kansas City, Los Angeles and Sacramento initiatives streetcar projects were bundled with other transportation projects including bridge and road maintenance. Only a few—the three mentioned above—of the ballots explicitly stated that new taxes would be used for streetcar projects. All ballot initiatives were largely supported by the voters, with between 54% and 87% approval, results that are consistent with trends in transportation ballot support nationally (Manville and Cummins, 2015). Local option taxes, particularly sales taxes, for transportation finance are a growing source of revenues although their use raises concerns about the equitable distribution of costs and benefits (Wachs, 2003; Schweitzer and Taylor, 2008; Taylor and Norton, 2009).

Three referenda—West Sacramento, Los Angeles and Kansas City—specifically mention that new taxes will go toward streetcar capital costs. Of these three West Sacramento was the only ballot presented to the entire county. Importantly, this ballot included flood provision improvements in addition to streetcar development. The two voter initiatives explicitly and solely for streetcar development, Los Angeles and Kansas City, constrained ballot voting to relatively small residential populations proximate to the proposed investment. In both cities, votes were collected through a mail-in ballot process rather than the regular election cycle. Voter turnout was exceptionally poor—19% of eligible voters in the Los Angeles case and 15% for Kansas City— but those that did cast a vote approved taxes that would largely be paid by others, either commercial properties or visitors to the area. In Los Angeles the bulk of revenues will come from commercial property taxes, even

Please cite this article as: King, D.A., Fischer, L.A., Streetcar projects as spatial planning: A shift in transport planning in the United States, Journal of Transport Geography (2016), http://dx.doi.org/10.1016/j.jtrangeo.2016.02.005

Table 5
Select ballot initiatives used to partially fund streetcar projects.

Project	City	Ballot initiative	Ballot date	Voters	Vote outcome
McKinney Ave Streetcar Expansion	Dallas, TX	Proposition 1 (for expansion)	9/7/2006	City of Dallas	Passed; 87.4%
S Line (Sugar House Streetcar)	Salt Lake City, UT	Proposition 3	11/1/2006	Salt Lake (Proposition 3) and Utah County residents	Passed; 64% (Salt Lake County)
Muni "F" Line/Fort Mason streetcar Extension	San Francisco, CA	Proposition K (for expansion)	11/4/2003	Registered voters in San Francisco City and County	Passed; 74.8%
First Hill Streetcar	Seattle, WA	Proposition 1	11/4/2008	Residents of King, Pierce and Snohomish counties	Passed; 60.5%
Sun Link	Tucson, AZ	Regional Transportation Special Election	5/16/2006	Residents of Pima County	Passed; 57.6%
Tempe South Streetcar	Tempe, AZ	Proposition 400 extends the half-cent sales tax	11/2/2004	Maricopa County Residents	Passed; 57.6%
Santa Ana and Garden Grove Fixed Guideway	Santa Ana, CA	Measure M Transportation Investment Plan	11/7/2006	Orange County	Passed; 69.7%
Downtown Streetcar	Los Angeles, CA	Community Facilities District	12/3/2012	Mail-in ballot for Residents living within CFD	Passed; 73%
Downtown/Riverfront Streetcar	Sacramento CA		11/4/2008	City of West Sacramento in Yolo County, California	Passed; 64.9%
Oklahoma City Streetcar	Oklahoma City, OK		12/8/2009	Oklahoma City Residents	Passed; 54%
Kansas City Downtown Streetcar	Kansas City, MO	Downtown Transportation Development District	12/11/2012	Mail-In ballot sent out 10/30/12 to 697 Downtown Residents	Passed 64%

Sources: Local election websites and media outlets.

though commercial property owners were not allowed to vote and their support for the project was not clear (Guzman, 2012). In Kansas City, approved revenue for streetcar construction and operation will be raised by a combination of special property assessments and a new retail sales tax that stretches several blocks beyond the streetcar corridor. Looking more closely at the voting turnout raises serious concerns about representation and the use of local ballots as a public decision making tool. In Kansas City, only 697 voters were cast, with 351 residents voting in support of the sales tax, essentially committing the city to substantial short and long-term obligations. These ballot initiatives are purposely designed to spread the costs of the systems as broadly as possible while concentrating the benefits, which is a common strategy in transportation finance to generate political support for controversial projects (King et al., 2007). Indeed, the success of Kansas City's downtown streetcar initiative is attributed to strategic construction of the ballot voting process, which stands in contrast to previous failed ballots to build more extensive rail-based transit systems (Personal Interviews).

The data from ballot initiatives suggests that transportation projects overall—and streetcar projects more specifically—are generally supported by voters. Voter support tends to increase when spending priorities are clearly identified for new taxes, and when voters are located in proximity to new facilities (Hannay and Wachs, 2006). Taken as a whole, local transportation finance options, including for streetcars, have a strong track record of success at the ballot box. It is reasonable to wonder why *if* streetcars generate so much local economic value and have high probabilities for local tax support, then why they need federal financial support to the extent proponents argue as opposed to a value capture mechanism to guide increased property values to finance the systems.

Instead it seems reasonable to expect that federally funded streetcar projects should be evaluated against other national priorities for transport spending, including projects aimed at facilitating an increased transit modal split, serving transit dependent or low-income communities or mitigating the environmental impacts of automobile travel. If streetcar investments are thought to have substantial effects on local economic development, perhaps a better funding source would be the Department of Housing and Urban Development (HUD) or a federal program that focuses more directly on fostering desirable local economic outcomes.

7. Conclusions

This paper argues that modern streetcar projects in the United States represent a turn toward spatial planning. We show that the expected benefits from streetcar projects—which are evaluated without consideration of expected system performance—accrue mostly to local property interests. This distribution of benefits is deliberate and is a departure from traditional transit planning where primary benefits accrue through improved accessibility and travel time improvements. Local economic development benefits are far from certain, however, and most often require a slate of complementary regulations and policies such as liberalized zoning.

From a more general perspective, the strategic spatial planning process of streetcars highlights a different focus for planning, similar to that observed in European cities (Olesen, 2014). The shift is complimented by a narrow common-sense discourse in which market competition—and the creation of a business friendly environment—has become a necessary (and at times the only) value in decision-making (Allmendinger and Haughton, 2012; Purcell, 2009; Sager, 2009, 2013). Referred to as the 'growth-first approach to urban development' (Peck and Tickell, 2002), the adoption of this framework means that certain policy objectives (i.e. improving service to low-income riders, or transit dependent populations) are deprioritized to the extent that they do not even appear on the radar of streetcar project planners. This is particularly troublesome in the United States where public transit policy is shaped by social welfare considerations, namely mobility for the carless,

whether by choice or circumstance. This mirrors the growth of spatial planning elsewhere of 'a gradual shift away from distributive policies, welfare considerations and direct service provision towards more market-oriented and market-dependent approaches aimed at pursuing economic promotion and competitive restructuring (Swyngedouw et al., 2002).

An unresolved concern about the spatial shift in transit planning is that the projects discussed here do not reflect long-term planning goals articulated through conventional planning processes. By creating support through local business communities and asking small groups of voters to directly approve individual projects, streetcar systems are not subject to the same level of transparency or trade-offs against other transit priorities within a region. The fact that regional transit agencies are rarely the champion of streetcars, and in many cases recuse themselves from the projects, suggests that there may be conflicting visions about how to best leverage scarce transportation resources to achieve spatial planning goals, including the geographic scale at which trade-offs and benefits should be evaluated. None of this is to say that streetcar projects should not be pursued by cities. Rather, we argue that these projects should be viewed as a turn toward spatial planning and be evaluated against other economic development strategies rather than against other transit improvements. Such a framework raises important questions about the role of federal transportation funding and whether new federal agencies should be making funds available for streetcars projects. Streetcars, as currently practiced in the United States, act as desirable amenities more than meaningful transit improvements.

Acknowledgements

The authors received financial support from the University Transportation Research Center Region 2 to assist with this research (RF 49198-22-26).

References

Allmendinger, P., Haughton, G., 2012. Post-political spatial planning in England: a crisis of consensus? Trans. Inst. Br. Geogr. 37 (1), 89–103. http://dx.doi.org/10.1111/j.1475-5661.2011.00468.x.

Banister, D., Berechman, Y., 2001. Transport investment and the promotion of economic growth. J. Transp. Geogr. 9 (3), 209–218. http://dx.doi.org/10.1016/S0966-6923(01)00013-8.

Boarnet, M.G., Compin, N.S., 1999. Transit-oriented development in San Diego County: the incremental implementation of a planning idea. J. Am. Plan. Assoc. 65 (1), 80.

Bollinger, C.R., Ihlanfeldt, K.R., 1997. The impact of rapid rail transit on economic development: the case of Atlanta's MARTA. J. Urban Econ. 42 (2), 179–204. http://dx.doi.org/10.1006/juec.1996.2020.

Brown, J., 2013. The modern streetcar in the US: an examination of its ridership, performance, and function as a public transportation mode. J. Public Transp. 16 (4) (Retrieved from http://www.nctr.usf.edu/wp-content/uploads/2013/12/jpt16.4_Brown.pdf).

Caruso Affiliated. (n.d.). The grove. Retrieved July 13, 2015, from http://www.carusoaffiliated.com/caruso/development/property.php?id_property=2

Cervero, R., 1984. Journal report: light rail transit and urban development. J. Am. Plan. Assoc. 50 (2), 133–147.

Cervero, R., Landis, J., 1995. The transportation–land use connection still matters. ACCESS Magazine 1 (7) (Retrieved from http://escholarship.org/uc/item/7x87v1zk).

Cervero, R., Murphy, S., Ferrell, C., Goguts, N., Tsai, Y.-H., Arrington, G.B., Witenstein, N., 2004. Transit Oriented Development in America: Experiences, Challenges, and Prospects. Transportation Research Board, National Research Council.

Curtis, C., Renne, J.L., Bertolini, L., 2009. Transit Oriented Development: Making it Happen. Ashgate Publishing, Ltd.

Divall, C., Bond, W. (Eds.), 2003. Suburbanizing the Masses: Public Transport and Urban Development in Historical Perspective. Aldershot, Hants, England. Ashgate, Burlington, VT, USA.

Dodson, J., 2009. The "infrastructure turn" in Australian metropolitan spatial planning. Int. Plan. Stud. 14 (2), 109–123. http://dx.doi.org/10.1080/13563470903021100.

Federal Transit Administration, 2014. National Transit Database Glossary. U.S. Department of Transportation, Washington, D.C. (Retrieved August 11, 2015: http://www.ntdprogram.gov/ntdprogram/Glossaries/pdf/Glossary2014.pdf).

Garrison, W.L., Levinson, D.M., 2006. The Transportation Experience : Policy, Planning, and Deployment. Oxford University Press, New York.

Giuliano, G., 1995. The weakening transportation–land use connection. ACCESS Magazine 1 (6) (Retrieved from http://escholarship.org/uc/item/1dn8t3w7.pdf).

Golem, R., Smith-Heimer, J., 2010. TCRP synthesis 86: relationships between streetcars and the built environment. Retrieved from http://www.nap.edu/catalog.php?record_id=14422.

Gomez-Ibanez, J.A., 1985. A dark side to light rail? The experience of three new transit systems. J. Am. Plan. Assoc. 51 (3), 337–351.

Guzman, R., 2012. Property owners split on $62 million streetcar. Retrieved July 13, 2015, from http://www.ladowntownnews.com/news/property-owners-split-on-million-streetcar/article_46cbb5b6-c155-11e1-a59a-0019bb2963f4.html (June 28).

Hagman, D., Misczynski, D., 1978. Windfalls for Wipeouts : Land Value Capture and Compensation. American Society of Planning Officials, Chicago.

Hannay, R., Wachs, M., 2006. Factors influencing support for local transportation sales tax measures. Transportation 34 (1), 17–35. http://dx.doi.org/10.1007/s11116-006-0006-4.

Hansen, W.G., 1959. How accessibility shapes land use. J. Am. Inst. Plann. 25 (2), 73–76. http://dx.doi.org/10.1080/01944365908978307.

HDR, 2011. City of Cincinnati Streetcar Project TIGER III Discretionary Grant Program Analysis Supplementary Documentation. (Retrieved from http://www.cincinnati-oh.gov/streetcar/linkservid/0787DB63-01AB-ADC2-0C8995847669EF2B/showMeta/0/).

Healey, P., Khakee, A., Motte, A., Needham, B., 1999. European developments in strategic spatial planning. Eur. Plan. Stud. 7 (3), 339–355.

Helling, A., 1997. Transportation and economic development: a review. Public Works Manag. Policy 2 (1), 79–93. http://dx.doi.org/10.1177/1087724X9700200108.

Jones, D.W., 1985. Urban Transit Policy : an Economic and Political History. Prentice-Hall, Englewood Cliffs, N.J.

Jones, D.W., 2008. Mass Motorization and Mass Transit: An American History and Policy Analysis. Indiana University Press, Bloomington.

King, D., 2011. Developing densely: estimating the effect of subway growth on New York City land uses. J. Transp. Land Use 4 (2). http://dx.doi.org/10.5198/jtlu.v4i2.185.

King, D., Manville, M., Shoup, D.C., 2007. The political calculus of congestion pricing. Transp. Policy 14 (2), 111–123.

Knight, R., Trygg, L., 1977. Evidence of land use impacts of rapid transit systems. Transportation 6 (3). http://dx.doi.org/10.1007/BF00177453.

Levinson, D., 2008a. Density and dispersion: the co-development of land use and rail in London. J. Econ. Geogr. 8 (1), 55–77. http://dx.doi.org/10.1093/jeg/lbm038.

Levinson, D.M., 2008b. The Orderliness Hypothesis: The Correlation of Rail and Housing Development in London (SSRN Scholarly Paper No. ID 1735652). Social Science Research Network, Rochester, NY (Retrieved from http://papers.ssrn.com/abstract=1735652).

Levinson, D., Zhang, L., 2006. Ramp meters on trial: evidence from the twin cities metering holiday. Transp. Res. A Policy Pract. 40 (10), 810–828. http://dx.doi.org/10.1016/j.tra.2004.12.004.

Loukaitou-Sideris, A., Banerjee, T., 2000. The blue line blues: why the vision of Transit Village may not materialize despite impressive growth in transit ridership. J. Urban Des. 5 (2), 101–125. http://dx.doi.org/10.1080/713683964.

Mallett, W.J., 2014. Federal Support for Streetcars: Frequently Asked Questions [Report]. (Retrieved July 13, 2015, from http://digital.library.unt.edu/ark:/67531/metadc306475/).

Manville, M., Cummins, B., 2015. Why do voters support public transportation? Public choices and private behavior. Transportation 42 (2), 303–332.

Neuman, M., Smith, S., 2010. City planning and infrastructure: once and future partners. J. Plan. Hist. 9 (1), 21–42. http://dx.doi.org/10.1177/1538513209355373.

Newman, P., 2009. Planning for transient oriented development: strategic principles. In: Curtis, C., Renne, J.L., Bertolini, L. (Eds.), Transit Oriented Development: Making it Happen. Ashgate Publishing, Ltd., USA, pp. 13–22.

Olesen, K., 2014. The neoliberalisation of strategic spatial planning. Plann. Theory 13 (3), 288–303. http://dx.doi.org/10.1177/1473095213499340.

Owen, D., 2011. Cincinnati streetcar: phase i cultural resources investigations (no. 10-6301.001). Parsons Brinckerhoff/HDR. Retrieved from http://www.cincinnati-oh.gov/streetcar/documents-references/environmental-documents/appendix-l11/.

Peck, J., Tickell, A., 2002. Neoliberalizing space. In: Brenner, N., Theodore, N. (Eds.), Spaces of Neoliberalism: Urban Restructuring in North America and Western Europe. Blackwell, Oxford, pp. 33–57.

Personal interviews with Kansas City Elected Officials, 2015. The Officials Requested Anonymity in Published Materials (May 14 and May 15).

Purcell, M., 2009. Resisting neoliberalization: communicative planning or counter-hegemonic movements? Plann. Theory 8 (2), 140–165. http://dx.doi.org/10.1177/1473095209102232.

Sager, T., 2009. Planners' role: torn between dialogical ideals and neo-liberal realities. Eur. Plan. Stud. 17 (1), 65–84. http://dx.doi.org/10.1080/09654310802513948.

Sager, T., 2013. Reviving Critical Planning Theory : Dealing with Pressure, Neo-Liberalism, and Responsibility in Communicative Planning. Routledge, New York.

Schweitzer, L., Taylor, B.D., 2008. Just pricing: the distributional effects of congestion pricing and sales taxes. Transportation 35 (6), 797–812. http://dx.doi.org/10.1007/s11116-008-9165-9.

Shapiro, J., 2013. Citing cost, city of Atlanta says MARTA won't operate streetcar. Retrieved July 13, 2015, from http://wabe.org/post/citing-cost-city-atlanta-says-marta-won-t-operate-streetcar.

Smith, J.J., Gihring, T.A., 2006. Financing transit systems through value capture. Am. J. Econ. Sociol. 65 (3), 751–786. http://dx.doi.org/10.1111/j.1536-7150.2006.00474.x.

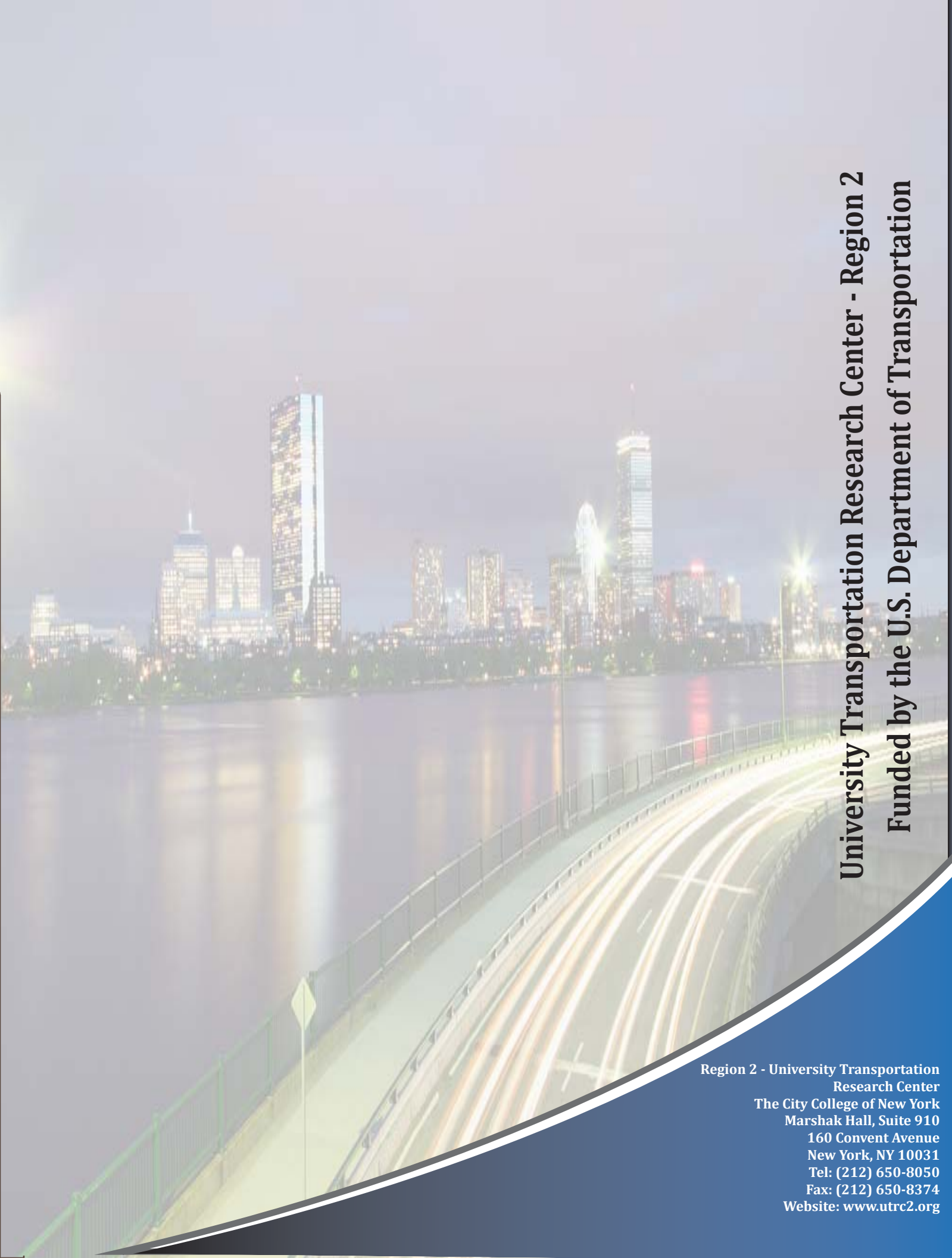
Swyngedouw, E., Moulaert, F., Rodriguez, A., 2002. Neoliberal urbanization in Europe: large–scale urban development projects and the new urban policy. Antipode 34 (3), 542–577. http://dx.doi.org/10.1111/1467-8330.00254.

Taylor, B.D., Norton, A.T., 2009. Paying for transportation What's a fair price? J. Plan. Lit. 24 (1), 22–36. http://dx.doi.org/10.1177/0885412209347156.

Please cite this article as: King, D.A., Fischer, L.A., Streetcar projects as spatial planning: A shift in transport planning in the United States, Journal of Transport Geography (2016), http://dx.doi.org/10.1016/j.jtrangeo.2016.02.005

Urban Land Institute, & Gladstone Associates, 1979. Joint Development : Making the Real Estate-Transit Connection/. Washington, Urban Land Institute.
Wachs, M., 2003. Local option transportation taxes: devolution as revolution. ACCESS Magazine 1 (22) Retrieved from http://www.accessmagazine.org/articles/spring-2003/local-option-transportation-taxes-devolution-revolution/.
Warner, S.B., 1962. Streetcar Suburbs: The Process of Growth in Boston, 1870–1900 (January).
Weiner, A., 2014. Why streetcars aren't about transit—next city. Next City. Retrieved from http://nextcity.org/forefront/view/why-streetcars-arent-about-transit (January 12).
Xie, F., Levinson, D., 2010. How streetcars shaped suburbanization: a granger causality analysis of land use and transit in the twin cities. J. Econ. Geogr. 10 (3), 453–470. http://dx.doi.org/10.1093/jeg/lbp031.

Please cite this article as: King, D.A., Fischer, L.A., Streetcar projects as spatial planning: A shift in transport planning in the United States, Journal of Transport Geography (2016), http://dx.doi.org/10.1016/j.jtrangeo.2016.02.005



University Transportation Research Center - Region 2

Funded by the U.S. Department of Transportation

Region 2 - University Transportation
Research Center
The City College of New York
Marshak Hall, Suite 910
160 Convent Avenue
New York, NY 10031
Tel: (212) 650-8050
Fax: (212) 650-8374
Website: www.utrc2.org