The Effects of BRT on Sectoral Employment Change in the U.S., 2000-2010

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Abstract: Recently Bus Rapid Transit (BRT) has gained in popularity across the United States due to its relatively low costs of development among transit types and its simultaneous potential to drive economic development. However, very little research has been conducted to understand the economic impacts of such systems across sectors. This paper uses buffer areas around BRT stations on nine lines opened in the mid-2000s across the U.S., and equally sized areas around control points, to estimate the effects of BRT stations on employment growth for sectors. We find that while our model adequately predicts overall employment change regardless of BRT, BRT is found to influence employment change in only one sector—manufacturing. We believe this finding should be encouraging to economic development planners, as manufacturing provides an employment base for a broad spectrum of income levels, and represents a significant share of industrial recruitment activity.

Key Words: Bus Rapid Transit, Employment, GIS model builder, NAICS, industry, sectors, economic development,

Introduction

Over the past two decades, various public transportation systems have been developed to provide people with better accessibility to their destinations while also changing car-dependent urban forms and improving environmental quality (Cervero & Dai, 2014). As one of the promising and sustainable public transportation alternatives, bus rapid transit (BRT) systems have gradually gained in popularity because they can provide better accessibility from origins to destinations while also yielding lower capital costs than rail-based transit options such as light rapid transit (LRT) and commuter rail (United States Government Accountability Office, 2012). Additionally, cities which have installed transit systems have seen economic activity in the form of retail, office, and residential developments along routes and around stations (Glaeser et al, 2010; De Bok and Bliemer, 2006; Banister and Berechman, 2001; Thole & Samus, 2009), though these studies use aggregated employment data and do not focus specifically on BRT. Recent urban economics and public transit literature question how the provision of rapid transit systems in a city can affect employment or overall industrial mix around transit corridors or stations. Identifying potential sectoral employment impacts of BRT can help planners and decision makers justify transit investments in BRT through economic development (D. G. Chatman & Noland, 2013; D. G. Chatman & Noland, 2011). Understanding sector-specific impacts can also assist planners in approaching the integration of transportation and land use planning near stations, where transit-oriented development (TOD) is a possibility.

However, few studies analyze the impact of BRT corridors on total employment change, and fewer still on individual sectors. This study addresses this literature gap by comparing sector-specific employment change near BRT stations along nine corridors with control points from 2002-2010. We use a series of regression analyses to argue that BRT systems have demonstrable employment effects on a single sector: manufacturing. Given the ongoing prominence of manufacturing in many state's economic development agendas, and the importance of connecting low-skill workers to jobs in this diverse sector, we believe our findings offer new opportunities for economic development planning around transportation.

Literature Review

Background: What is BRT and How Does It Compare to LRT?

Public transit systems are often promoted as offering a range of social, economic, and environmental benefits to urban populations (Dunn, 2010; Kang, 2010; Polzin & Baltes, 2002). BRT systems are the latest trend in the fields of public transit and transportation planning. Part of this recent popularity in BRT stems from its more affordable cost of system development when compared to light rail transit (LRT) (Cervero & Dai, 2014; Levinson et al., 2003; Polzin & Baltes, 2002). In addition to saving dollars in initial capital investments, a municipality can use BRT as an economic development tool (Levinson et al., 2003), though research comparing the economic development potential of BRT relative to other transit types remains nascent.

LRT systems have long been considered by users as preferable to bus systems. How are they different? Simply, BRTs are abstractly defined as bus services with advanced operational features that are uniquely branded from other local bus services(Levinson et al., 2003). BRT systems typically include separate priority-lanes, faster passenger boarding and fare collection (typically off of the vehicle and on a platform), and a distinct, recognizable branding image.

Branding provides a BRT system with a neighborhood identity and style (Hook, Lotshaw, & Weinstock, 2013; Thole & Samus, 2009; United States Government Accountability Office, 2012; Urban Land Institute, 2011). Such physical features provide community members and developers with a sense of permanence which the fixed-rail investment of an LRT typically signifies (R. Cervero & Dai, 2014; Davis et al., 2007; Polzin & Baltes, 2002; Polzin, 1999). BRT systems are easier to construct with gradual investment to include different routes and operational features (R. Cervero & Dai, 2014; Hook et al., 2013; Kang, 2010; Polzin & Baltes, 2002). Through case studies of six cities (Pittsburgh, Los Angeles, New York, etc.), Thole and Samus (2009) argue that there are no apparent differences between the land use incentives offered by cities for BRT versus LRT projects. In other qualitative case studies of BRT development practices in both developing and developed countries, BRT can be as influential as rail systems in encouraging urban redevelopment (Cervero, 2013; Cervero & Dai, 2014).

BRT and Economic Development

Considering the economic motivations often cited in the development of transit systems, it is vital to understand how BRT can be used as more than a mobility investment (Cervero & Dai, 2014), but also as a catalyst for economic development. As expanded upon below, global cities have described significant development occurring along BRT lines and adjacent to installed BRT stations (Cervero & Dai, 2014; Levinson et al., 2003). Moreover, cities have experienced land value increases surrounding BRT stations (Cervero & Dai, 2014; R. Cervero & Kang, 2011; Levinson et al., 2003).

However, there are limits to the economic development potential of BRT systems. Several studies have shown transit alone cannot induce economic development in a weak real estate market (Cervero & Dai, 2014; Cervero & Landis, 1997). BRT might also not produce desired economic development benefits if installed without appropriate planning processes. To produce effective BRT systems, municipal planning agencies must recognize a BRT investment should be integrated holistically into all economic development, transportation, and land use plans. With such plans and policies, a BRT can serve as a focal point, or “backbone” (Cervero & Dai, 2014), to guide urban growth in a more transit-oriented fashion. Literature outlines the theoretical possibilities for economic growth around BRT corridors or stations to be strengthened when BRTs couple with zoning incentives, density bonuses, higher floor area ratio (FAR), street-facing orientation for buildings, specified setbacks, mixed-use and TOD, and pedestrian-oriented design standards (Cervero & Dai, 2014; Levinson et al., 2003; Government Accounting Office, 2012). This manuscript argues that in the U.S., BRT specifically benefits one sector—manufacturing. As such, the zoning and land use considerations to foster economic development around corridors and stations should focus on development that will facilitate growth in this sector.

While, as described, existing studies show a relationship between economic development and BRT, we currently have a limited understanding of how BRT impacts the location choice of specific industries (Graham, 2007; Kang, 2010). Other studies that intersect transit and economic development often focus on rail transit (Belzer et al., 2011; Bollinger & Ihlanfeldt, 1997; Graham, 2007; Nelson et al., 2013; Polzin, 1999). One exception to this is a study of creative industries near BRT stations in Seoul, South Korea, which found a positive relationship between BRT and employment densities. We add to this previous work through the study of nine BRT corridors in eight U.S. counties, and through the lens of employment change in disaggregated, two-digit NAICS code sectors. This manuscript also uses a before-and-after analysis, which has also been called for in the literature (Kang, 2010).

Although exceptionally little literature exists from which we can form *a priori* hypotheses regarding impacts for specific sectors, we are able to form some hypotheses based on existing knowledge of the physical characteristics of our sample of BRT corridors. Among our sample of nine BRT corridors, four have segments built near industrial areas, suggesting that we might see employment impacts to industrial sectors (and, that different effects might be observed depending on corridor design and sample). Two other systems were developed to connect residential areas to downtowns, suggesting that BRT might impact employment in downtown industries, such as retail, finance, entertainment, etc. In total, our sample of corridors is built in a variety of settings, creating the opportunity to observe employment growth across a variety of sectors. In all cases, the BRT corridors studied herein are located in urban settings, and thus are more likely to influence sectors and sub-industries commonly found in urban settings, rather than sectors that are land-intensive or more mature in their product cycle, and thus more likely to locate away from centers of innovation.

Methods

This manuscript investigates the impacts of BRT on employment changes of each sector between 2002 and 2010 by using Longitudinal Employer-Household Dynamics (LEHD) employment data. A BRT case of Arizona is an exception because the LEHD database provides Arizona employment data between 2004 and 2010. Throughout this manuscript, we use the term “sector” to refer to 2-digit NAICS level establishments and employment, and “industry” to refer to the 3-digit or finer-grained NAICS levels. Our sample includes 226 BRT stations situated along the nine BRT corridors opened between 2002 and 2010 in eight U.S. counties (Table 1). We treat pairs of split-platforms as single stations. The analysis evaluates changes that occur within a 0.25 mile buffer area around each point. While some transportation research uses a 0.50 mile buffer (Guerra, Cervero, & Tischler, 2012; McDonnell & Madar, 2011), we chose the 0.25 mile buffer due to its common use in research on bus-related economic impacts specifically. Previous research has shown that the majority of economic impact occurs within this radius (American Public Transit Association, 2009). A secondary reason to choose a 0.25 mile buffer is to reduce the co-location of multiple stations within overlapping buffers. The station areas and comparable areas are all equal in area, mitigating concerns regarding sample size and comparability that arise when analysis is based only on block groups that are neighbors of block groups with stations, or which have centroids that fall within a set radius of a station.

Table 1: BRT Corridors Included in Analysis

Name of Corridor	**County**	**Host Metropolitan Statistical Area**[1]	**Year Corridor Opened**
Main Street BRT	Maricopa County, Arizona	Phoenix	2008
Orange Line	Los Angeles County, California	Los Angeles	2005

[1] Host Metropolitan Statistical Areas are given for reference purposes, but note that BRT systems exist in all case study cases within single counties.

Silver Line	Los Angeles County, California	Los Angeles	2009
Main Street BRT	Jackson County, Missouri	Kansas City	2005
MAX BRT	Clark County, Nevada	Las Vegas	2004
Bx12SBS	Bronx County, New York	New York City	2008
HealthLine BRT	Cuyahoga County, Ohio	Cleveland	2008
Emerald Express (EMX) BRT	Lane County, Oregon	Eugene	2007
3500 South MAX BRT	Salt Lake County, Utah	Salt Lake City	2008

We investigate the role of BRT station presence by comparison to intra-county control points. This method was chosen for a variety of reasons. Transit stations and corridors, BRT systems included, are not located randomly, but rather are situated to maximize ridership while navigating land ownership, zoning, and other planning issues. Consequently, stations and corridors often run through areas enjoying urban densities, multiple types of transit networks, and significant other forms of investment, both public and private. In other words, transit and density benefit one another (Graham, 2007; Venables, 2007), and density also benefits urban economic development (Glaeser, 2011). Therefore, analyzing economic development, whether via job growth, productivity, or other metrics, without controlling for the context, leaves analysis open to the likelihood of misattributing growth to transit, when transit and economic development occur endogenously.

Controlling for context might be accomplished in one of several ways. Initially, controlling for context via inclusion of variables for population density, rail transit provision, employment density, and other socioeconomic and infrastructure variables seems promising, but the problem of endogeneity remains. To overcome the endogeneity challenge, we instead created a pool of comparable points. These comparable points were selected based on similar initial-year characteristics; a dummy variable signifying BRT station status (dummy=1) or control point (dummy=0) was then introduced to our model, as specified below.

We selected by drawing a 0.25 mile buffer around each block group centroid within the host county, then spatially apportioning data from Census geographies into the geographies created by drawing the buffers. Then, the buffered areas (henceforth “comparable points”) were ranked from most to least similar to each BRT station. To establish likeness, the quadrance distance was calculated using 5 variables in t=0 (2000): total population, total employment, median household income, total housing units, and total households. Each variable i was converted to a z-score for BRT stations and all other Census block groups within the county. The ten points having the lowest quadrance value (Equation 1) were selected as the control points for each BRT station.

$$Quadrance = \sum_{i=1}^{n} (Z_{BRT} - Z_{Comp})^2$$

(1)

Where:
i = variable used to identify control points: population, employment, median household income, housing units, households
Z = z-score of each variable *i*
BRT = the 0.25 mile area surrounding the BRT station
Comp = the 0.25 mile area surrounding the block group centroid of each non-BRT block group in the host county

In many cases, identical candidate points were identified as comparable points for multiple BRT stations. In these cases, the point was assigned as a comparable point for the station for which it had a lower quadrance value. After removing duplicate comparable points, a pool of 1,085 comparable points was identified for use in analysis. Descriptive statistics of the sectoral employment change between 2002 and 2010 are given in Table 2. This table suggests that BRT might influence employment in a number of sectors, contrary to the findings based in the more rigorous analyses presented below.

Table 2: Descriptive Statistics

	Station Areas		**Comparable Points**	
	# Jobs	**% Jobs**	**# Jobs**	**% Jobs**
Agriculture, Forestry, Fishing and Hunting	-70	-45%	-324	-35%
Mining, Quarrying, and Oil and Gas Extraction	-223	-28%	596	74%
Utilities	5,716	41%	-1,690	-17%
Construction	-1,619	-19%	-9,709	-19%
Manufacturing	-3,891	-30%	-46,549	-37%
Wholesale Trade	-19	0%	1,960	2%
Retail Trade	1,718	7%	13,878	10%
Transportation and Warehousing	26	0%	1,309	4%
Information	-4,729	-28%	8,406	10%
Finance and Insurance	-1,683	-3%	10,366	15%
Real Estate and Rental and Leasing	265	3%	6,482	19%
Professional, Scientific, and Technical Services	-197	0%	27,939	28%
Management of Companies and Enterprises	-8,351	-42%	-13,974	-30%
Administrative and Support and Waste Management and Remediation Services	-4,187	-16%	25,392	23%
Educational Services	7,975	33%	-908	-1%
Health Care and Social Assistance	12,517	29%	60,970	34%
Arts, Entertainment, and Recreation	365	2%	3,715	12%
Accommodation and Food Services	449	1%	4,367	3%
Other Services (except Public Administration)	1,171	5%	12,105	25%
Public Administration	68,877	140%	179,401	83%
Total Employment Change	*74,110*		*283,732*	

Having established the pool of observations, consisting of 0.25 mile buffers around 226 BRT stations and 1,085 distinct comparable points, we constructed a series of regression models to test the impact of BRT stations on employment growth at the sectoral level. The models' dependent variable is employment change within the buffer area. The variation in the dependent variable is modeled as a function of initial year conditions and sectoral diversity within the 0.25 mile buffer area, state, and our key independent variable, BRT station presence. The Herfindahl-Hirschman Index (HHI) is a commonly used index to measure degree of market concentration in urban economics, but it can also be used to evaluate the degree of industrial mix (while we analyze sectors, we have retained the term "industrial mix" to maintain consistency with how the HHI is referenced in literature) within an area. Table 3 summarizes the variables and data sources.

Table 3: Variables and Data Sources

Variable	**Description**	**Data Source**
EMPCH	Employment change between 2002 and 2010	LEHD 2002 and 2010
POPDEN00	Population density	Census 2000
HHINDEX00	Herfindahl-Hirschman Index	LEHD 2002
MEDINC00	Median household income, 2000	Census 2000
TOTEMP02	Total employment, 2002 (2004 for Arizona)	LEHD 2002, 2004
POP00	Total population, 2000	Census 2000
BRT	Presence of a BRT station	General Transit Feed Specification 2014, 2015
AZ	Dummy variable for Arizona	
CA	Dummy variable for California	
MO	Dummy variable for Missouri (used as referent)	
NV	Dummy variable for Nevada	
NY	Dummy variable for New York	
OH	Dummy variable for Ohio	
OR	Dummy variable for Oregon	
UT	Dummy variable for Utah	

To test overall model fit, we modeled overall employment change as a function of the variables given in Table 2. Following the overall specification, we constructed a model for each of the 20 two-digit NAICS sectors given in the LEHD data. We conducted preliminary analyses to test our compliance with OLS assumptions, and make corrections where necessary. We identified two areas of concern: heteroscedasticity, and the influence of outliers.

While our dependent variable was normally distributed, we found heteroscedastic error terms across models. To correct these, we calculated robust error terms for each model. The influence of outliers required an inspection of data. We discovered that, depending on the sector being modeled, between two and approximately five points could be considered outliers, and compromised the model fit and diagnostics. In virtually all cases, these points were control points near one station on the Bx12SBS corridor in the Bronx. Employment growth between

2002 and 2010 had been astronomical within the buffer areas of these control points, and as such, the points behaved unlike the control points on other corridors, or like the station areas themselves. After careful consideration, and analysis of residual plots and dispersion metrics, we decided to remove the control points with a Cook's distance of greater than 0.6 from the regressions. Removing these observations resulted in drastic improvements to the models' AIC values, and modest increases in R^2 values.

Following these series of regression models, we then rely on County Business Pattern data to provide more descriptive knowledge of the sectors that are significantly influenced by the presence of BRT. This information reveals whether change was concentrated in single 3-digit NAICS industries within the larger 2-digit sectors, was distributed across multiple 3-digit industries. This descriptive narrative focuses on number of firms and on employment.

Results and Discussion

Results

While our research design calls for the specification of a regression model for each sector, we tested the specification's validity by first specifying a model of overall employment change. These results, given in Table 3, show an adjusted R2 of 0.31 and statistical significance for the intercept and for the control variable TOTEMP00. Table 3 suggests that the specification provides a reasonable amount of explanatory power for the dependent variable. The model does not show multicollinearity, and heteroscedasticity has been corrected through the use of a White corrected robust error.

Table 3: OLS Results of Total Employment Change

	Coefficient	**White Std. Error**	**Significance**
Intercept	-487.8068	211.1062	**
POPDEN00	-2509.8520	1687.8280	
HHINDEX00	0.0558	0.0952	
MEDINC00	0.0076	0.0054	
TOTEMP00	0.2765	0.0870	***
POP00	3195.7060	2148.9700	
BRT	-75.4365	195.5599	
AZ	-288.0192	221.8283	
CA	-403.4474	276.8615	
NV	-340.9106	244.4557	
NY	-191.2666	355.7224	
OH	6.1519	99.7816	
OR	-101.8161	157.8812	
UT	-65.4031	137.5000	

Adjusted R^2 = 0.31
*** $p < 0.01$; ** $p < 0.05$

The same methodological process was followed for each 2-digit NAICS sector given in the LEHD data. In each case, the standard OLS was tested, observations with a Cook's Distance of >0.6 were removed, the model was re-fitted, then corrected for heteroscedastic error terms, which was necessary for all models. Several sectors' regressions showed strong overall model fit, but an insignificant coefficient for the key independent variable, the BRT dummy, even if p-values of 0.10 were used. These models include Health Care and Social Assistance, Management of Companies and Enterprises, Public Administration, and Retail Trade.

While the model itself predicts employment change reasonably well overall, it shows that BRT statistically significantly influences employment change for just one sector: manufacturing. Table 4 shows these results. As our key independent variable is not a significant predictor of employment change in other sectors, we have omitted those results.

Table 4: Regression Results for Employment Change in Manufacturing

	Coefficient	**White Std. Error**	**Significance**
Intercept	25.3499	18.4015	
POPDEN00	-108.7747	118.1543	
HHINDEX00	0.0129	0.0054	**
MEDINC00	-0.0012	0.0005	**
TOTEMP00	-0.0262	0.0069	***
POP00	138.4978	150.4391	
BRT	38.9773	12.8323	***
AZ	-9.7021	12.1985	
CA	-5.4440	16.3507	
NV	-6.5041	11.7218	
NY	-56.9105	38.5219	
OH	-40.4694	9.7416	***
OR	-15.3542	9.6197	
UT	-5.2817	7.0745	

Adjusted $R^2 = 0.42$

*** $p < 0.01$; ** $p < 0.05$

As Table 4 shows, the presence of BRT positively and significantly influences employment in the Manufacturing sector across our sample. Nationally, the manufacturing sector has changed dramatically in recent decades which adds context to the interpretation of our results. Employment in the manufacturing sector peaked at 22% of the U.S. workforce in 1979, and then employment declined 40% by 2010 to possess only 9% of the U.S. workforce (Cochrane, Koropeckyj, Smith, and Ellis, 2014). From January 2000 through January 2010, the U.S. shed 582,200 or approximately 34% of manufacturing jobs (Bureau of Labor Statistics, Current Employment Statistics Survey). Our sample behaved similarly; collectively, our 1,311 observations (stations and controls) lost 50,440 manufacturing jobs (36%) between 2002 and

2010. The average buffer in our sample experienced an employment change of -27 manufacturing jobs.

This context alters the interpretation of our findings. If the average buffer area lost 27 jobs between 2002 and 2010, but the presence of BRT adds 39 jobs, it stands to reason that BRT can be utilized as a valuable asset in the retention of manufacturing jobs. It seems less likely that BRT systems will lead to a large-scale reorganization or growth of the manufacturing sector nationally. However, these findings suggest that planners working to integrate land use and transportation planning consider how certain zoning and land use characteristics around BRT stations can find efficiencies to benefit the manufacturing sector. In other words, if BRT acts as an external benefit of agglomeration for manufacturing, what other infrastructure or land use planning can public agencies direct in support of that industrial district? These decisions could guide planning and zoning for the areas around BRT stations to become TODs.

To better understand the dynamics at play in the manufacturing sector, we analyzed data from the Census Bureau’s County Business Patterns database. Nationally, these data show a decline in the number of establishments and the number of paid employees across all sub-industries, with one exception: Beverage and Tobacco Product Manufacturing, which as a whole gained establishments while declining in paid employment. A deeper inspection of the data reveals that the growth in the number of establishments in sub-industry 312 are in beverage manufacturing, and within that, in breweries, wineries, and distilleries. However, beverage manufacturing is not the most prominent manufacturing sub-industry in 2010 in terms of employment or number of firms. On the contrary, it is among the smaller industries.

The complicated narrative of the beverage industry being simultaneously successful yet small belies the most compelling need for further research on this topic: there is a lot of nuance, and understanding that nuance necessitates understanding local context. Yet, sub-industry data for small areas does not exist in any publicly accessibly, standardly formatted manner. Further analysis using proprietary data providing more information on the sub-industry composition and size of manufacturing firms should be pursued prior to designing local policies connecting BRT with labor force development strategies, site planning, or industry-based economic development strategies. A balanced economic development strategy to connect BRT to manufacturing stability and growth will likely consider connections with multiple manufacturing sub-industries within any given city.

Discussion

The results presented here provide guidance to planners hoping to use BRT as an economic development tool. Our results suggest that BRT may be a valuable tool in retaining manufacturing employment at the local level. Planners should integrate our findings with a close evaluation of local strengths in manufacturing sub-industries and should analyze those sub-industries’ national trends during early stages of the planning process.

Within the manufacturing sector, it remains unclear by what mechanism BRT facilitates employment growth. A few potential mechanisms seem plausible. First, it is possible that BRT systems benefit manufacturing through the creation of thicker labor pools by making the industrial district more accessible to potential workers. In this case, BRT not only affords economic development, but also improves accessibility for the economically diverse labor force engaged in manufacturing employment, thus also provides a social equity argument for the transit system.

Second, it seems plausible that depending on the sub-industry benefitted, BRT systems might improve consumers' accessibility to manufacturers of goods. This seems especially likely in instances where manufacturing intersects with the tourism industry, such as is the case with chocolate manufacturing in Hershey, Pennsylvania, or the Ford River Rouge Factory Tour in Michigan. In such cases, planners can focus on connecting tourism-oriented locations to manufacturing hubs rather than solely connecting places of residence with places of work for employees, though this would likely remain important as well.

Third, indirect mechanisms might also be at play. One might theorize that BRT systems allow households to reduce expenditures for commuting, thus permitting increased expenditures for household goods purchased through local manufacturers. However, this scenario is predicated upon the assumption that those households using the BRT system also then purchase the locally-produced goods. This assumption requires that it is either reduced expenditures among the employees of the manufacturing firms serviced by BRT corridors, or the employees of other industries that also exist within the buffer areas of the BRT stations. Alternately, BRT may represent a public good that benefits a range of firms, allowing them to increase demand for manufacturing products made hyper-locally, meaning within their 0.25-mile buffer area.

Finally, further research on the manufacturing sector could uncover a qualitative understanding of the perceived value of BRT infrastructure to local business leaders and their workforces. Such field work could also be used to trace any economic linkages between manufacturing firms and either residential or commercial demand for manufacturing products. Further quantitative work should also investigate the impact of BRT on manufacturing growth in terms of employment size of firms, and on the potential to incite new firms to join an industrial district. If, as the first hypothesis suggests, BRT systems encourage the development of a thicker local labor market, existing firms might capitalize on its presence through expansion. An expanding industrial district creates other benefits of agglomeration economies, which could lure new firms.

Conclusion

Through our series of regression analyses we find that the manufacturing sector experiences employment growth around BRT stations compared to employment change around our control points. There may be opportunities where BRT can provide connectivity for manufacturers and consumers, which has been stressed as an important component of agglomeration economies and productivity (Graham, 2007). Of course, it is also possible, even likely, that there are non-manufacturing, statistically significant employment impacts on specific BRT corridors that do not emerge in our analysis.

While we are encouraged by these findings, future analyses can supplement this study. More contextual analyses should be conducted around BRT and control points. This could be accomplished either through case study analyses or through analysis of more detailed datasets which at present are unavailable, although private data providers may have this in the near future. Analysis based on qualitative field work, case studies, or improved data might also suggest revisions to our model specifications that will improve model fit.

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