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THE RELATIONSHIP BETWEEN ROAD INFRASTRUCTURE BUDGETARY EXPENDITURES AND COMMERCIAL PROPERTY INVESTMENT RETURNS. CASE STUDY OF FADIKPE AREA MINNA, NIGERIA

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Abstract. The paper examines the relationship existing between commercial property investment returns and public capital investment (budgetary expenditures) on road infrastructure in Fadikpe area, Minna (Nigeria) with the aim of determining the degree of impact of public capital investment on commercial property investment returns. The paper addresses a pertinent policy and practice question on the impact of government's budgetary expenditures on real estate sector of the economy. Government increasingly faces funding challenges in providing new infrastructure or improvement of existing ones, thus, keen to know the areas of greater impact of its expenditures and the extent to which the benefits from the impact may go in augmenting or providing funds (through tax) for new road infrastructure provision or repair of existing ones. The research uses the before-and-after case method to identify an increase in property values (rental and sales) as measured by the trend of property investment returns before-and-after budgetary expenditures. The results show that commercial property investment returns in the area increased after budgetary expenditure (road construction) took place. The results form the basis upon which the government should consider more budgetary allocations and expenditures related to road transportation infrastructure in its budgetary allocation decisions. The results also quantify the proposed alternative source of funding (property tax) that can be harnessed via capturing the increase in property investment returns.

Keywords: *budgetary expenditures, commercial property, investment returns, road infrastructure, relationship.*

INTRODUCTION

According to Yen *et al.* (2018), cities are centres of economic activities; hence, there is a need for convenient delivery of goods and services for the sustainability of city economic activities.

Fadikpe area, being an aspect of Minna Metropolitan, will equally require the necessary accessibility for optimal delivery of goods and services. Fadikpe area of Minna is a high-density area comprising mixed use properties (residential and

commercial). Nowadays, there is the quest for infrastructure that should have impact on virtually all sectors of the economy (Gibbons *et al*., 2019). According to Lieske *et al*. (2018), the impact of transportation infrastructure provision on real estate investment is a good example. Provision of this infrastructure is, however, capital intensive (Hesse and McDonough, 2018).

Government budgetary expenditures have been the only source of road infrastructure provision in Nigeria and there are competing demands on these expenditures (Adebosin *et al*., 2019). Thus, it has become necessary for the government to device the mechanism of identifying the best area to carry out capital investments that will create for it an alternative means or sources of funding infrastructure provision such as value capture (Roukouni *et al*., 2018). According to Porter and Kramer (2019), value capture means the identification and documentation of the increase in property values due to certain public capital investment in a limited benefit area.

These increased property values result in boosting the real estate sector of the economy due to an increase in real estate investment returns (Jedwab and Storeygard, 2019; Yang *et al*., 2019). As a means of alternative source of road infrastructure funding, value added property taxes on increased property values can be partially or totally used for the funding of public capital investments (Noring, 2019; Grover and Walacik, 2019). In a nutshell, value capture is all about the increase in value of nearby properties that seems to have benefited from better accessibility that accompanies public capital investments.

Though, literature has revealed various case study areas and demonstrated the results of infrastructure depended property value uplift, some governments still appreciate the importance of value capture due to value uplift. Government of New South Wales is an example that changed the name 'value capture' to 'value sharing' (Yen *et al*., 2018). This means that the government will share from the value uplift to be able to raise additional funds to finance public projects. Again, though there is a variety of studies on the impact of transportation infrastructure on property values and mostly on rails/road versus residential properties (Wang *et al*., 2019; Seo *et al*., 2019; Yang *et al*., 2019; Baker and Lee, 2019; Li, Chen and Zhao, 2019), there is lack of research on the budgetary aspects of the provision of this infrastructure and commercial property investments.

This paper, therefore, examines the relationship between commercial property investment returns and road infrastructure budgetary expenditures in Fadikpe area of Minna with the aim of determining the degree of impact of the budgetary expenditures on commercial property investment returns.

The research uses the before-and-after case method to identify an increase in property values (rental and sales) as measured by the trend of property investment returns before-and-after budgetary expenditures.

The paper is arranged as follows: Section 2 provides literature review on property value uplift resulting from public transport infrastructure provision mode wise, quantity wise and timing wise of uplift and the kind of influencing factors. Then, the road provision is discussed in the case study, the adopted methodology is introduced, as well as the analysis of data is performed. Results of the research are

also provided and interpreted. Final section deals with the discussion of the results, draws conclusions and provides recommendations.

1. LITERATURE REVIEW

Alonso (1964) and Muth (1969) developed the land theory forming the theoretical underpinnings of property inclined value uplifts resulting from improved accessibility. In essence, land rents are higher with improved accessibility because it provides greater accessibility opportunities to land holders in terms of destination. Though this theory is related to unimproved land (Yen *et al.*, 2018), it gives the basis for the general notion that public capital investments in accessibility related transportation infrastructures, such as road and rail, will lead to a positive increase in property values within the area of the project. According to McAllister (2019), a specific tax is not always required in practice for value uplift to be captured for income generation purposes, rather governments across the globe have some forms of land taxation in place that provides for indirect benefits from an increase in the property value.

Despite this indirect benefit, governments are increasingly seeking for additional revenue generation sources to fund public capital investments and property value uplift capture due to the improved accessibility project that is one of the sources through which additional revenue can be generated by governments to help fund public capital investments. Most transportation infrastructure is geared towards the achievement of a certain policy of interest given its capital intensiveness. It is an instrument of value capture policies (Kyriacou *et al.*, 2019). The Hong Kong's Metro Rail (MTR) and the London cross rail projects are examples where value capture has been successfully implemented (Mathur, 2019; Mangioni, 2019).

In Hong Kong's MTR, development of property above stations has been providing funding for rail development and this is referred to as improved rail property model. London's cross rail project had funding from proximate businesses through business rate supplement. Value uplift capturing has been the focal point of an increasing literature base, specifically considering the joint development schemes in India (Mathur, 2019) or London (Sovacool and Yazdi, 2019) and covering new financing plans and methods that include stamp duty land tax, capital gains tax, business rates and council tax. Mathur (2019) extended the list by covering more instruments that have been used in the Indian context (Funding of Delhi Metro).

However, it will be irrelevant putting in place a value uplift capturing tool when there is no uplift to be captured (McAllister, 2019). This paper, therefore, focuses on the importance of the determination of property value uplift so that capture can be effectively done. Identification of value uplift, according to Yen *et al.* (2019), has been a major area of focus of many studies across the globe. Determining value uplift, researchers in the field of land use policy have placed great effort not only on the identification but also on the description of its characteristics (Yen *et al.*, 2019). Methodologically, the present research shifts enormously from those studies

of the late 1990s with the use of geo-spatial property sets of data, which allow for an empirical analysis of contours in urban land rents. Beginning with simple pairs or spatial regression techniques in the hedonic pricing studies, early researchers (McDonald and Osuji, 1995; Cervero and Duncan, 2002; McMillen and McDonald, 2004, Du and Mulley, 2007) started revealing different and, in most situations, positive uplift of value within heavy and light rail investments. These models were, however, unable to take into consideration the variations as regards location with respect to neighbourhood. It gave rise to sophisticated models that are based on Lancaster's consumer demand theory. This theory argues that consumer demands are affected by the characteristics of the goods rather than the goods as single entities (Lancaster, 1966). Furthermore, Rosen (1974) provided the theoretical framework for knowing the clearing prices of goods in the market based on their characteristics.

This promoted the treatment of bid rent ideas in a hedonic model proposed by Alonso (1964) and Muth (1969) as a series of implicit prices. The hedonic price model usually uses market prices of the houses as dependent variables and identifies the value of easy accessibility through controlling the characteristics of the houses themselves and the neighbourhood in a multi-variation regression model. Earliest hedonic models have been criticised because they do not take into consideration the effects of spatial data. It should be noted that endogeneity effects have recently been of more concern, too.

A variety of spatial tools have been developed and made possible by the increase in computing power and the analytical chances presented through the availability and advancement in quality of geospatial data, to solve spatial concerns. Mohammad *et al*. (2015) showed that improvements such as difference-in-differences models also assisted with possible concerns over endogeneity. Recent studies on value uplift have resulted in the use of advanced methods to tap into a wide range of research questions as well as to look at wider sets.

The improvements in methodology include the addition of a quality set of controllable variables in the likes of crime data analyses (Billings, 2011), the discovery of longitudinal studies through the use of data on repeat sales (Pagliara and Papa, 2011), methods to solve dependence effects of spatial variables (Cao and Porter-Nelson, 2016) and improved methods such as geographic weighted regression - GWR (Du and Mulley, 2006; Mulley, 2014) and pseudo panel data (Mohammed *et al*., 2015). Heterogeneity of uplift and downlift across geographical areas and stations becomes clearer when matched pair or GWR studies are employed.

Both uplift and downlift have been identified within different stops of public transport in the BFS (Tsai *et al*., 2015) and the BLS (Hess and Almeida, 2007). Though, on average throughout the study areas, there was value uplift at specific sites, local factors contextually hindered investment in public transport from yielding positive land value impacts. Almost all the major modes in use in urban public transport today have been studied by researchers, also finding uplift effects for light rail (Billings, 2011; Murray, 2016; Yen *et al*., 2018), bus way systems (Deng and Nelson 2013; Zhang and Liu, 2015; Stokenberga, 2014), urban ferries

(Tanko *et al*., 2019) and bicycle sharing stations (Chu *et al*., 2019), as well as high speed rail stations (Wang and Gu, 2019; Beckerich *et al*., 2019). Results of previous studies are mixed in nature. Though, many of the studies (Tsai *et al*., 2015; Mulley *et al*., 2016) conclude that some positive value uplift effects exist. Other studies such as those by Crocker *et al*. (2000), Du and Mulley (2007), Knowles and Ferbrache (2016), Mohammed *et al*. (2013) reported a negative impact from the provision of light rail systems.

According to Yen *et al*. (2018), suggestions from some authors for the different outcomes might be attributed partially to the application of methods varying from earlier ones that lack the capacity to reveal the complex nature of varying factors, which might affect housing market. According to Knowles and Ferbrache (2016), location like rail infrastructure also matters irrespective of whether it is for the provision of new land for development or re-organising city land use. House price impact can also be delayed due to light rail implementation and economic environment reasons (Siripanich *et al*., 2019). Additionally, Mulley (2014) opines that expectations play a significant role in a value uplift period despite knowing governments for the cancellation of projects, which hardly prevents uplift at the commencement of projects.

2. THE RESEARCH GAP

Previous studies have virtually all centred on the impact of transportation infrastructure itself on Property Values (PVs) with no focus on costs (Budgetary Expenditures) of putting the infrastructure in place. Apart from not considering the costs of infrastructure, effects are always checked on property values only and not on property investment returns.

The present research does not, however, consider costs of rail systems (the area of most previous studies) but rather the road construction costs. This is because there is no functional rail system in the study area and very few studies considered Commercial Property Values (CPVs). Hence, the present research covers the three gaps of Costs (Budgetary Expenditures), Investment Returns and Commercial Properties. The importance of knowing the impact of costs on investment returns is that it answers cost-benefit questions pertaining investment versus returns from it.

Commercial properties are considered here because these are the properties found proximate to the road.

3. FADIKPE-KPAKUNGU CRESCENT ROAD CONSTRUCTION

Fadikpe-Kpakungu Crescent is a link road constructed by the Niger State Government. It was completed and put into use in 2016, which cost the sum of three million two hundred and sixty-five thousand six hundred and eighty-four point ninety-one American dollars (USD 3 265 684.91) only. The road serves as a by-pass against the usual Kpakungu roundabout traffic jam for commuters going towards Bida road. The area of the case study falls under Chanchaga Local Government area, Minna, Niger State.

4. RESEARCH METHOD

Quantitative and qualitative research methods were used to collect data for the study. Qualitatively, rental and sales values of commercial properties were obtained through an interview of tenants and practising estate surveyors and valuers. Quantitatively, budgetary expenditures of the road were obtained from the Niger State Ministry of Planning and Infrastructural Development.

5. DATA ANALYSIS AND RESULTS

Table 1. Average Property Values before and after Road Construction

PERIOD	BUDGETARY EXPENDITURE, USD	AVERAGE PROPERTY VALUE, USD
After	3 265 684.91	177.23 p.a
Before	-----	53.17 p.a
Difference	-----	124.06 ➡ 233.33% increase

Source: Field work (2019)

Table 1 shows that before budgetary expenditure, average property value in the study area was USD 53.17 p.a but rose to USD 177.23 p.a after the expenditure resulting in 233.33 % increase in a property value in the study area.

6. FINDINGS AND DISCUSSION

Descriptively, it was revealed that there was a strong relationship between road infrastructure budgetary expenditures and commercial property investment returns in Fadikpe area of Minna. It means that government budgetary expenditures on road constructions, apart from providing social benefits, also provide economic benefits.

Thus, the government can also benefit from the economic gains its expenditures have generated through a property tax.

CONCLUSION

In other for the government to maximally benefit from its expenditures, it should, in the first place, invest more in sponsoring studies of this nature. It should then engage valuation professionals for property value uplift capturing for property tax purpose.

REFERENCES

Adebosin, W. G., Toriola, A. K., Salami, L. A., Saula, D. T., & Ayanwole, A. A. (2019). The Effect of Infrastructural Investment on Sustainable Development in Nigeria (1980–2016). *Izvestiya*, *2*, 148–163.

Alonso, W. (1964). *Location and land use: Toward a general theory of land rent*. Cambridge, Harvard Univ. Press.

Baker, D. M., & Lee, B. (2019). How does light rail transit (LRT) impact gentrification? Evidence from fourteen US urbanized areas. *Journal of Planning Education and Research*, *39*(1), 35–49. https://doi.org/10.1177/0739456X17713619

Beckerich, C., Benoit, S., & Delaplace, M. (2019). Are the reasons for companies to locate around central versus peripheral high-speed rail stations different? The cases of Reims central station and Champagne-Ardenne station. *European Planning Studies*, *27*(3), 574–594. https://doi.org/10.1080/09654313.2019.1567111

Billings, S. B. (2011). Estimating the value of a new transit option. *Regional Science and Urban Economics*, *41*(6), 525–536. https://doi.org/10.1016/j.regsciurbeco.2011.03.013

Cao, X. J., & Porter-Nelson, D. (2016). Real estate development in anticipation of the Green Line light rail transit in St. Paul. *Transport Policy*, *51*, 24–32. https://doi.org/10.1016/j.tranpol.2016.01.007

Cervero, R., & Duncan, M. (2002). Transit's value-added effects: Light and commuter rail services and commercial land values. *Transportation Research Record: Journal of the Transportation Research Board*, *1805*(1), 8–15. https://doi.org/10.3141/1805-02

Chu, J., Duan, Y., Yang, X., & Wang, L. (2019). The Last Mile Matters: Impact of Dockless Bike Sharing on Subway Housing Price Premium. *Management Science*. https://doi.org/10.1287/mnsc.2019.3550

Crocker, S., Dabinett, B., Gore, T., Haywood, R., Hennebury, J., Kirkpatrick, A., Lawless, P., Townroe, P., (2000). Monitoring the Economic and Development Impact of South Yorkshire Supertram. Centre for Regional and Economic and Social Research, Sheffield Hallam University.

Deng, T., & Nelson, J. D. (2013). Bus Rapid Transit implementation in Beijing: An evaluation of performance and impacts. *Research in Transportation Economics*, *39*(1), 108–113. https://doi.org/10.1016/j.retrec.2012.06.002

Du, H., & Mulley, C. (2006). Relationship between transport accessibility and land value: Local model approach with geographically weighted regression. *Transportation Research Record*, *1977*(1), 197–205. https://doi.org/10.1177/0361198106197700123

Du, H., & Mulley, C. (2007). The short-term land value impacts of urban rail transit: Quantitative evidence from Sunderland, UK. *Land Use Policy*, *24*(1), 223–233. https://doi.org/10.1016/j.landusepol.2005.12.003

Gibbons, S., Lyytikäinen, T., Overman, H. G., & Sanchis-Guarner, R. (2019). New road infrastructure: the effects on firms. *Journal of Urban Economics*, *110*, 35–50. https://doi.org/10.1016/j.jue.2019.01.002

Grover, R., & Walacik, M. (2019). Property Valuation and Taxation for Fiscal Sustainability–Lessons for Poland. *Real Estate Management and Valuation*, *27*(1), 35–48. https://doi.org/10.2478/remav-2019-0004

Hess, D. B., & Almeida, T. M. (2007). Impact of proximity to light rail rapid transit on station-area property values in Buffalo, New York. *Urban studies*, *44*(5-6), 1041–1068. https://doi.org/10.1080/00420980701256005

Hesse, M., & McDonough, E. (2018). Ports, cities and the global maritime infrastructure. *(Eds) R. Kloosterman, V. Mamadouh, P. Terhorst, Handbook on the Geographies of Globalization*. Edward Elgar Pub. https://doi.org/10.4337/9781785363849.00038

Jedwab, R., & Storeygard, A. (2019). The average and heterogeneous effects of transportation investments: Evidence from Sub-Saharan Africa 1960–2010. Working paper No. 2019-8, National Bureau of Economic Research. https://doi.org/10.3386/w27670

Knowles, R. D., & Ferbrache, F. (2016). Evaluation of wider economic impacts of light rail investment on cities. *Journal of Transport Geography*, *54*, 430–439. https://doi.org/10.1016/j.jtrangeo.2015.09.002

Kyriacou, A. P., Muinelo-Gallo, L., & Roca-Sagalés, O. (2019). The efficiency of transport infrastructure investment and the role of government quality: An empirical analysis. *Transport Policy*, *74*, 93–102. https://doi.org/10.1016/j.tranpol.2018.11.017

Lancaster, K. J. (1966). A new approach to consumer theory. *Journal of political economy*, *74*(2), 132–157. https://doi.org/10.1086/259131

Li, S., Chen, L., & Zhao, P. (2019). The impact of metro services on housing prices: a case study from Beijing. *Transportation*, *46*(4), 1291–1317. https://doi.org/10.1007/s11116-017-9834-7

Lieske, S. N., van den Nouwelant, R., Han, H., & Pettit, C. (2018). Modelling value uplift on future transport infrastructure. In *Real Estate and GIS,* (Eds) R. Reed, C. Pettit*,* pp. 80–98. Routledge. https://doi.org/10.1201/9781315642789-5

Mangioni, V. (2019). Value capture taxation: alternate sources of revenue for Sub-Central government in Australia. *Journal of Financial Management of Property and Construction*, *24*(2). https://doi.org/10.1108/JFMPC-11-2018-0065

Mathur, S. (2019). An evaluative framework for examining the use of land value capture to fund public transportation projects. *Land Use Policy*, *86*, 357–364. https://doi.org/10.1016/j.landusepol.2019.05.021

McAllister, P. (2019). The taxing problems of land value capture, planning obligations and viability tests: some reasonable models? *Town Planning Review*, *90*(4), 429–451. https://doi.org/10.3828/tpr.2019.28

McDonald, J. F., & Osuji, C. I. (1995). The effect of anticipated transportation improvement on residential land values. *Regional Science and Urban Economics*, *25*(3), 261–278. https://doi.org/10.1016/0166-0462(94)02085-U

McMillen, D. P., & McDonald, J. (2004). Reaction of house prices to a new rapid transit line: Chicago's midway line, 1983–1999. *Real Estate Economics*, *32*(3), 463–486. https://doi.org/10.1111/j.1080-8620.2004.00099.x

Mohammad, S. I., Graham, D. J., & Melo, P. C. (2015). The effect of the Dubai Metro on the value of residential and commercial properties. *Journal of Transport and Land Use*, *10*(1). https://doi.org/10.5198/jtlu.2015.750

Mohammad, S. I., Graham, D. J., Melo, P. C., & Anderson, R. J. (2013). A meta-analysis of the impact of rail projects on land and property values. *Transportation Research Part A: Policy and Practice*, *50*, 158–170. https://doi.org/10.1016/j.tra.2013.01.013

Mulley, C. (2014). Accessibility and residential land value uplift: Identifying spatial variations in the accessibility impacts of a bus transitway. *Urban Studies*, *51*(8), 1707–1724. https://doi.org/10.1177/0042098013499082

Mulley, C., Ma, L., Clifton, G., Yen, B., & Burke, M. (2016). Residential property value impacts of proximity to transport infrastructure: An investigation of bus rapid transit and heavy rail networks in Brisbane, Australia. *Journal of Transport Geography*, *54*, 41–52. https://doi.org/10.1016/j.jtrangeo.2016.05.010

Murray, C. (2016). Land value uplift from light rail. *SSRN, 2834855*. https://doi.org/10.2139/ssrn.2834855

Muth, R., 1969. Cities and Housing. University of Chicago Press, Chicago, USA.

Noring, L. (2019). Public asset corporation: A new vehicle for urban regeneration and infrastructure finance. *Cities*, *88*, 125–135. https://doi.org/10.1016/j.cities.2019.01.002

Pagliara, F., & Papa, E. (2011). Urban rail systems investments: an analysis of the impacts on property values and residents' location. *Journal of Transport Geography*, *19*(2), 200–211. https://doi.org/10.1016/j.jtrangeo.2010.02.006

Porter, M. E., & Kramer, M. R. (2019). Creating shared value. In Lenssen G., Smith N. (eds) *Managing sustainable business* (pp. 323–346). Springer, Dordrecht. https://doi.org/10.1007/978-94-024-1144-7_16

Rosen, S. (1974). Hedonic prices and implicit markets: product differentiation in pure competition. *Journal of political economy*, *82*(1), 34–55. https://doi.org/10.1086/260169

Roukouni, A., Macharis, C., Basbas, S., Stephanis, B., & Mintsis, G. (2018). Financing urban transportation infrastructure in a multi-actors environment: the role of value capture. *European Transport Research Review*, *10*(1), 14. https://doi.org/10.1007/s12544-017-0281-5

Seo, K., Salon, D., Kuby, M., & Golub, A. (2019). Hedonic modeling of commercial property values: distance decay from the links and nodes of rail and highway infrastructure. *Transportation*, *46*, 859–882. https://doi.org/10.1007/s11116-018-9861-z

Siripanich, A., Rashidi, T. H., & Moylan, E. (2019). Interaction of Public Transport Accessibility and Residential Property Values Using Smart Card Data. *Sustainability*, *11*(9), 2709. https://doi.org/10.3390/su11092709

Sovacool, B. K., & Yazdi, A. H. (2019). Technological frames and the politics of automated electric light rail rapid transit in Poland and the United Kingdom. *Technology in Society*, *59*, 101190. https://doi.org/10.1016/j.techsoc.2019.101190

Stokenberga, A. (2014). Does bus rapid transit influence urban land development and property values: A review of the literature. *Transport Reviews*, *34*(3), 276–296. https://doi.org/10.1080/01441647.2014.902404

Tanko, M., Cheemarkurthy, H., Kihl, S. H., & Garme, K. (2019). Water transit passenger perceptions and planning factors: A Swedish perspective. *Travel Behaviour and Society*, *16*, 23–30. https://doi.org/10.1016/j.tbs.2019.02.002

Tsai, C. H. P., Mulley, C., Burke, M., & Yen, B. (2015). Exploring property value effects of ferry terminals: Evidence from Brisbane, Australia. *Journal of Transport and Land Use*, *10*(1). https://doi.org/10.5198/jtlu.2015.562

Wang, L., & Gu, H. (2019). Impact of HSR Station on the Surrounding Area. In *Studies on China's High-Speed Rail New Town Planning and Development,* (pp. 87–111). Springer, Singapore. https://doi.org/10.1007/978-981-13-6916-2_3

Wang, W., Zhong, M., & Hunt, J. D. (2019). Analysis of the Wider Economic Impact of a transport Infrastructure Project Using an Integrated Land Use Transport Model. *Sustainability*, *11*(2), 364. https://doi.org/10.3390/su11020364

Yang, L., Zhou, J., & Shyr, O. F. (2019). Does bus accessibility affect property prices? *Cities*, *84*, 56–65. https://doi.org/10.1016/j.cities.2018.07.005

Yen, B. T., Mulley, C., & Shearer, H. (2019). Different Stories from Different Approaches in Evaluating Property Value Uplift: Evidence from the Gold Coast Light Rail System in Australia. *Transportation Research Record*, *2673*(3), 11–23. https://doi.org/10.1177/0361198118823001

Yen, B. T., Mulley, C., Shearer, H., & Burke, M. (2018). Announcement, construction or delivery: When does value uplift occur for residential properties? Evidence from the Gold Coast Light Rail system in Australia. *Land use policy*, *73*, 412–422. https://doi.org/10.1016/j.landusepol.2018.02.007

Zhang, M., & Liu, Y. (2015, January). An exploratory analysis of Bus Rapid Transit on property values: A case study of Brisbane's South East Busway. In *State of Australian Cities National Conference,* 2015, Gold Coast, Queensland, Australia.

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