

Reducing Crime Without the Police? Evidence from a Place-Based Infrastructure Intervention in Bogotá, Colombia

Ignacio Sarmiento-Barbieri¹ Michael Weintraub² Carlos Diaz³ Olga Lucía Sarmiento⁴

¹Department of Economics, Universidad de los Andes, Colombia

²Department of Political Science and CESED, Universidad de los Andes, Colombia

³Department of Economics, Universidad Alberto Hurtado, Chile ⁴School of Medicine, Universidad de los Andes, Colombia

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Motivation

Crime is a major challenge in developing countries, yet policing strategies often fail

- ▶ Police may be poorly equipped, corrupt, or use excessive force
- ▶ Intensive policing interventions do not always reduce crime (Collazos et al. 2021; Blattman et al. 2023)
- ▶ Alternative strategies that do not directly involve law enforcement are needed

Can large-scale urban infrastructure improve public safety?

- ▶ Small-scale interventions (street lighting, tree cover) show promise (Chalfin et al. 2022; Branas et al. 2016)
- ▶ But evidence on large-scale infrastructure projects is limited

This Paper

We study TransMiCable:

A gondola lift system in Bogotá, Colombia

- ▶ Inaugurated in 2018, connecting Ciudad Bolívar (marginalized, high-crime area) to the mass transit network
- ▶ 3.4 km, three stations, cost \$109 million USD
- ▶ Reduced commute times from 1 hour to 15-20 minutes



This Paper

Research Question: Did TransMiCable change crime patterns in its area of influence?

Preview of results:

- ▶ Crime decreases by about 0.15 cases per block near the hillside cable stations (within 800 m).
- ▶ These reductions start during construction and persist after inauguration.
- ▶ The Tunal terminal does not follow this pattern, crime increases there in operation, consistent with higher target density and easy exit.
- ▶ We also find increases at nearby SITP stops outside the cable catchment.
- ▶ Interpretation: a local “eyes on the street” effect at stations, plus a displacement/opportunity effect at the main transfer node and along the feeder network.

Related literature

Crime and place-based interventions

- ▶ Civilian/visibility programs can lower crime without traditional policing (Sarmiento-Barbieri, Singh, McMillen 2019, Safe Passage, Chicago).
- ▶ Environmental upgrades make nearby amenities valuable once crime is down (Albouy, Christensen, Sarmiento-Barbieri 2020).
- ▶ Related: lighting, greening, micro place activation (Branas et al. 2016; Chalfin et al. 2022).
- ▶ Policing in low- and middle-income settings shows mixed or short-lived effects (Collazos et al. 2021; Blattman et al. 2023).

Transit and urban infrastructure

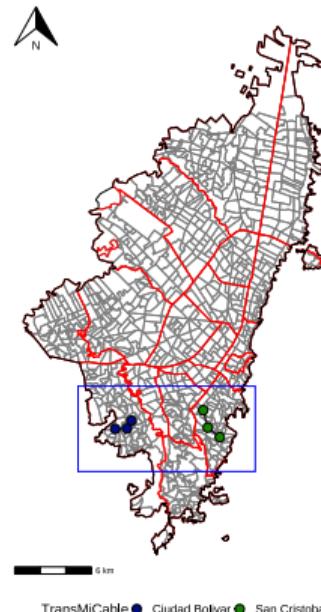
- ▶ Transit is usually evaluated on mobility/welfare, crime effects are mixed and often secondary (Montolio 2018; Herrmann et al. 2021; Phillips & Sandler 2015).
- ▶ Very little evidence from large cable systems in low-income, high-crime areas.
- ▶ Existing work rarely tracks what happens at downstream nodes of the same network.

Setting: Ciudad Bolívar and TransMiCable

Crime in

Ciudad Bolívar characteristics:

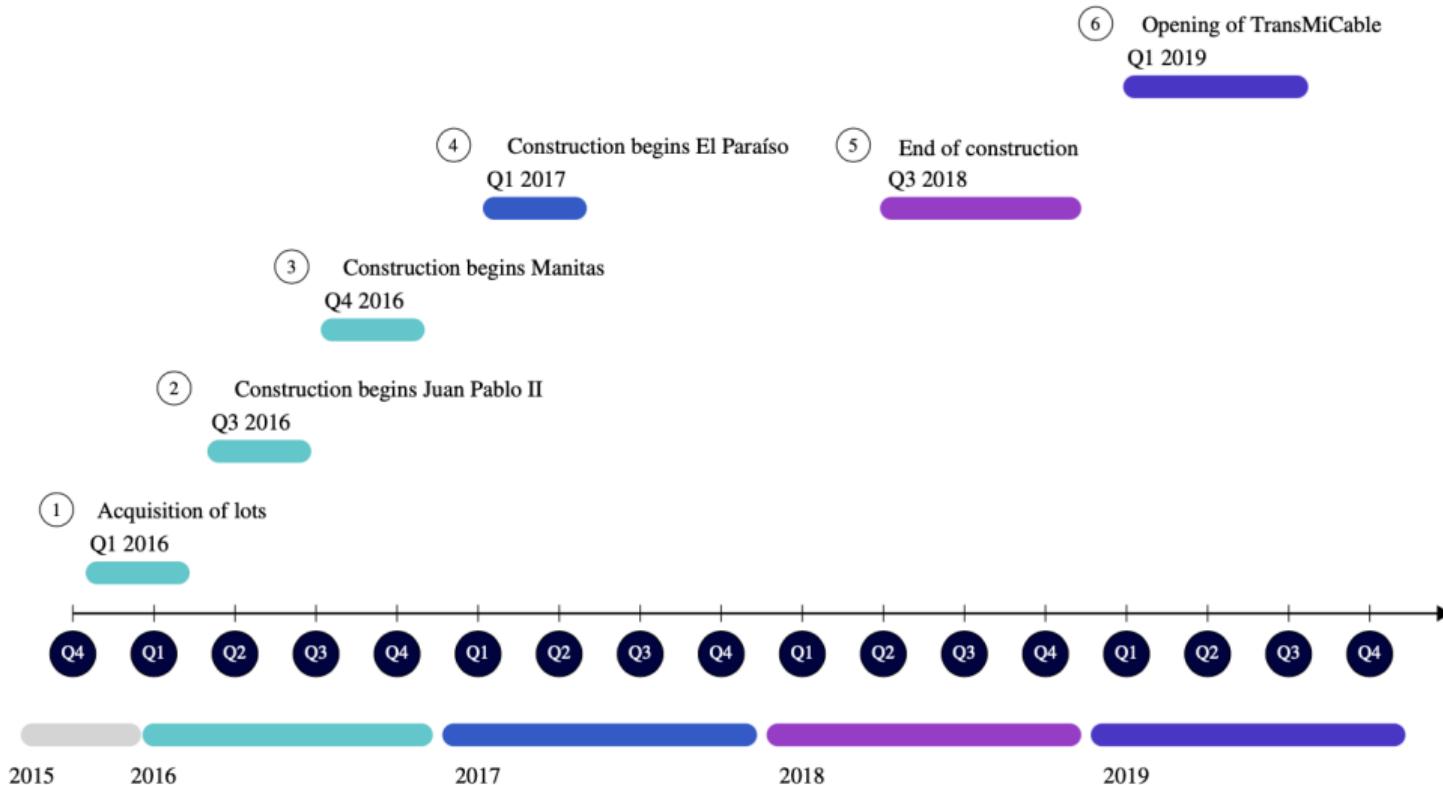
- ▶ One of Bogotá's poorest and most dangerous localities
- ▶ Homicide rate: 42 per 100,000
- ▶ Located on steep Andes mountain slopes, difficult to access
- ▶ Limited formal public transit before TransMiCable



comparative context (recent years):

- ▶ 3 × higher than Bogotá city average (14 per 100,000)
- ▶ Ciudad Bolívar (42) vs. Chicago (23), Toronto (2.6), Santiago-Chile (6.3), and Karachi (12.5).
- ▶ Reflects concentrated urban inequality common across Latin America

Setting: Ciudad Bolívar and TransMiCable

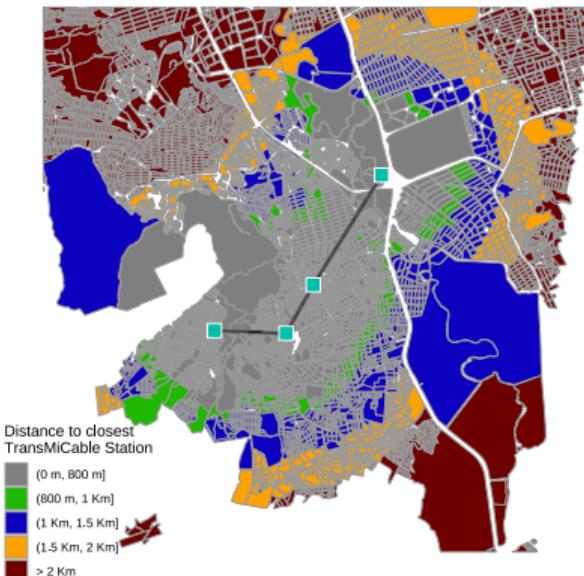


Data and Identification Strategy

Data:

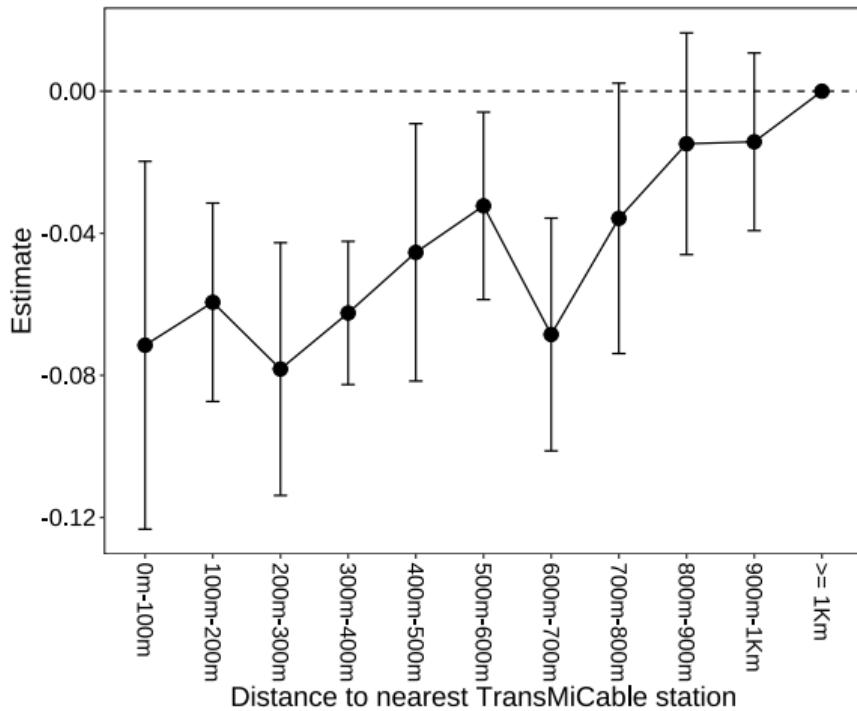
- ▶ Geo-located administrative crime data (Colombian National Police)
- ▶ Block-level, quarterly counts from 2012-2019
- ▶ Crime types: total, violent, property, domestic violence

Identification:



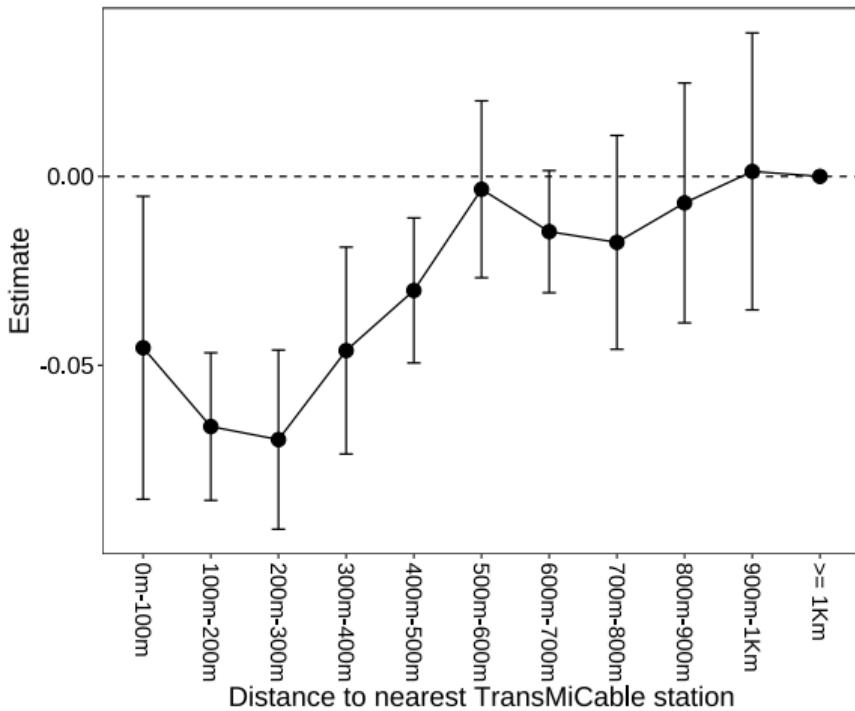
Proximity to closest station Crime Reduction Near Stations

TWFE



Control group: blocks more than 1,000 meters to nearest TransMiCable station

Violent Crime



Control group: blocks more than 1,000 meters to nearest TransMiCable station

Property Crime

Empirical Strategy: Difference-in-Differences

$$\begin{aligned} Crime_{it} = & \beta \cdot 1[\text{Distance}_i \leq 800] \times \text{Post Opening}_{it} \\ & + \alpha_i + \delta_t + \varepsilon_{it} \end{aligned}$$

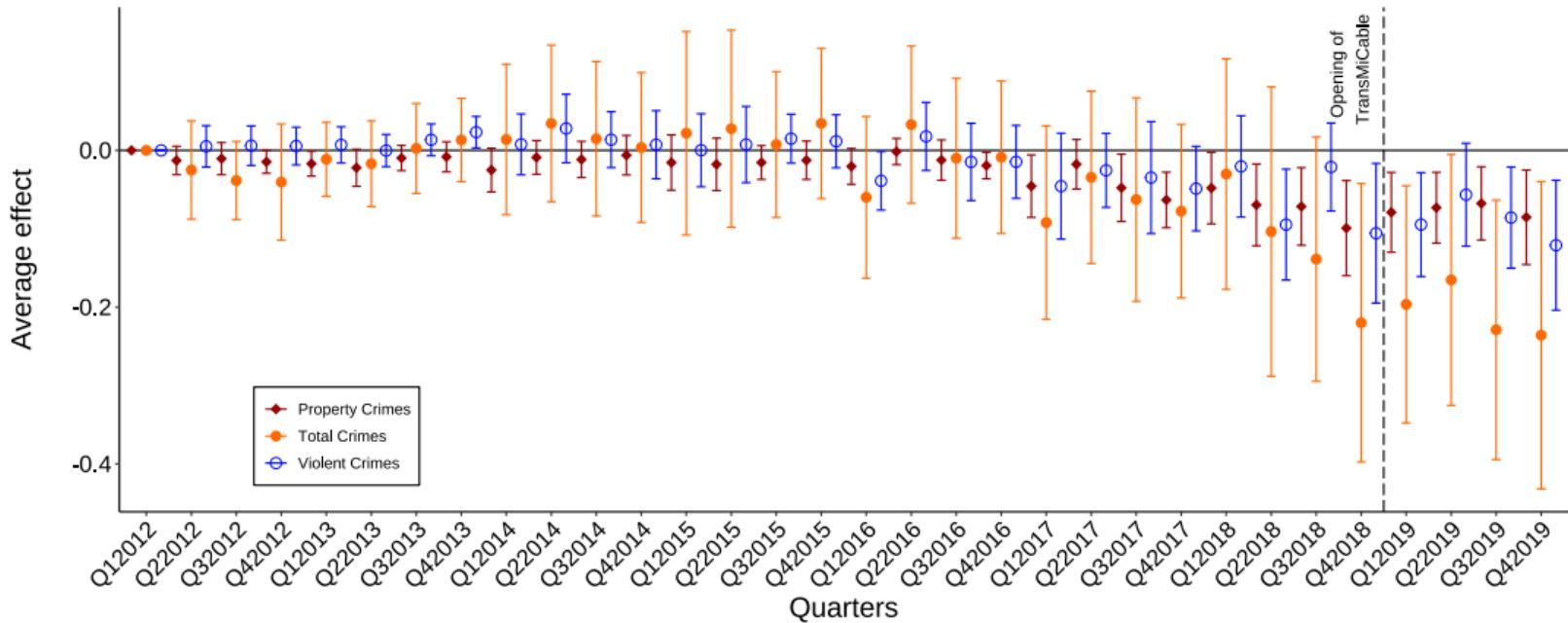
- ▶ $Crime_{i,t}$: number of crimes (total, violent, or property) in block i during quarter t .
- ▶ $1[\text{Distance}_i \leq 800]$: indicator for blocks within 800 meters of a station.
- ▶ Post Opening_{it} : indicator equal to one for all quarters after the opening of the nearest station.
- ▶ α_i : block fixed effects; δ_t : quarter-year fixed effects.
- ▶ Standard errors clustered at block level.
- ▶ β : parameter of interest: captures the average change in crime near stations after inauguration.

Main Results: Crime Reduction Near Stations

TransMiCable opening significantly reduced crime within 800m of stations

	Total Crime	Violent Crime	Property Crime
1[Distance ≤ 800m] × Post Opening	-0.154 *** (0.057)	-0.073 *** (0.023)	-0.056 *** (0.020)
Control mean (post Opening) Effect	0.666 -23.1%	0.214 -33.3%	0.170 -32.9%
Observations	103,296	103,296	103,296

Dynamic Effects: Crime Declined During Construction



Dynamic Effects: Crime Declined During Construction

Event study reveals crime reductions began before inauguration

- ▶ Crime starts declining in late 2016 (construction phase)
 - ▶ Reductions persist and deepen after inauguration (Q4 2018)
 - ▶ Parallel trends hold in the pre-construction period
 - ▶ Construction was staggered, so there is potential bias in TWFE estimates.

Dynamic Effects: Crime Declined During Construction

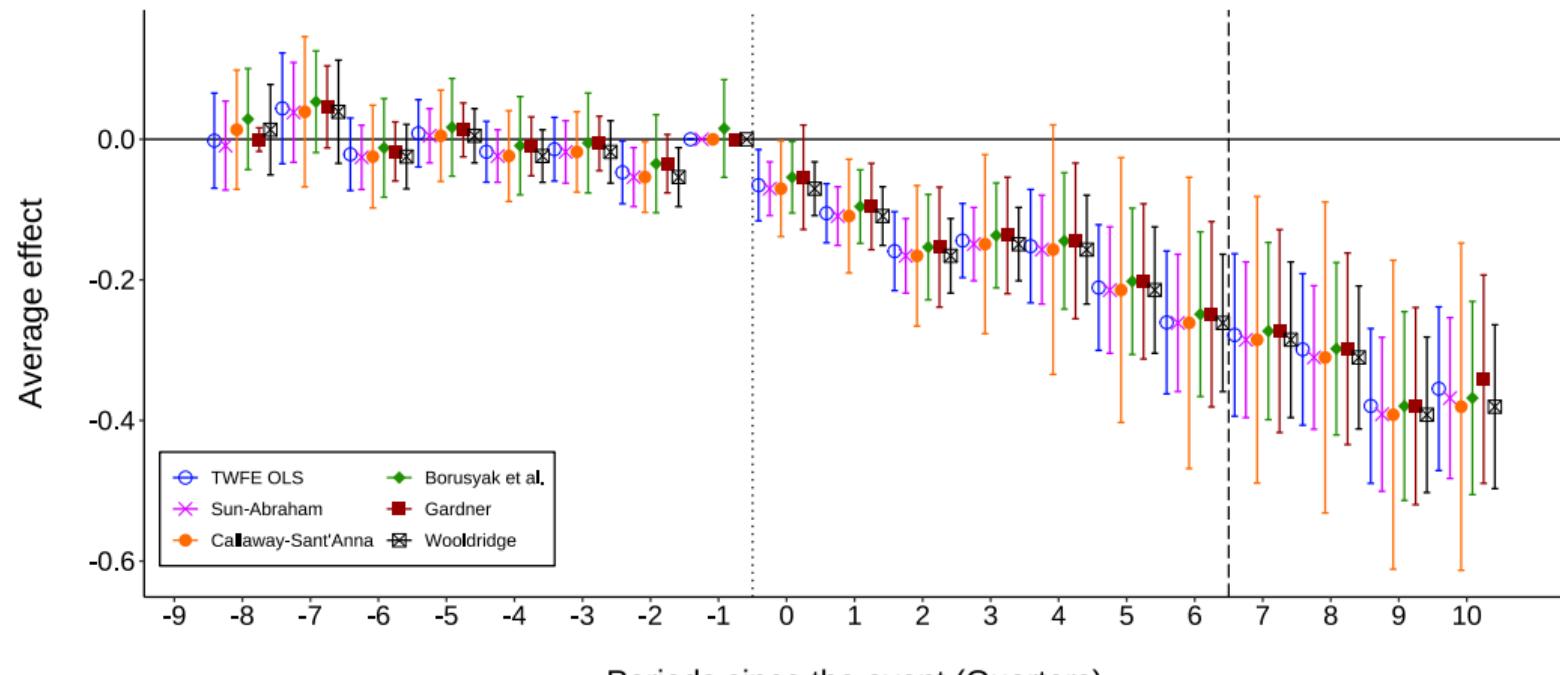


Figure 2: Total crime

Dynamic Effects: Crime Declined During Construction

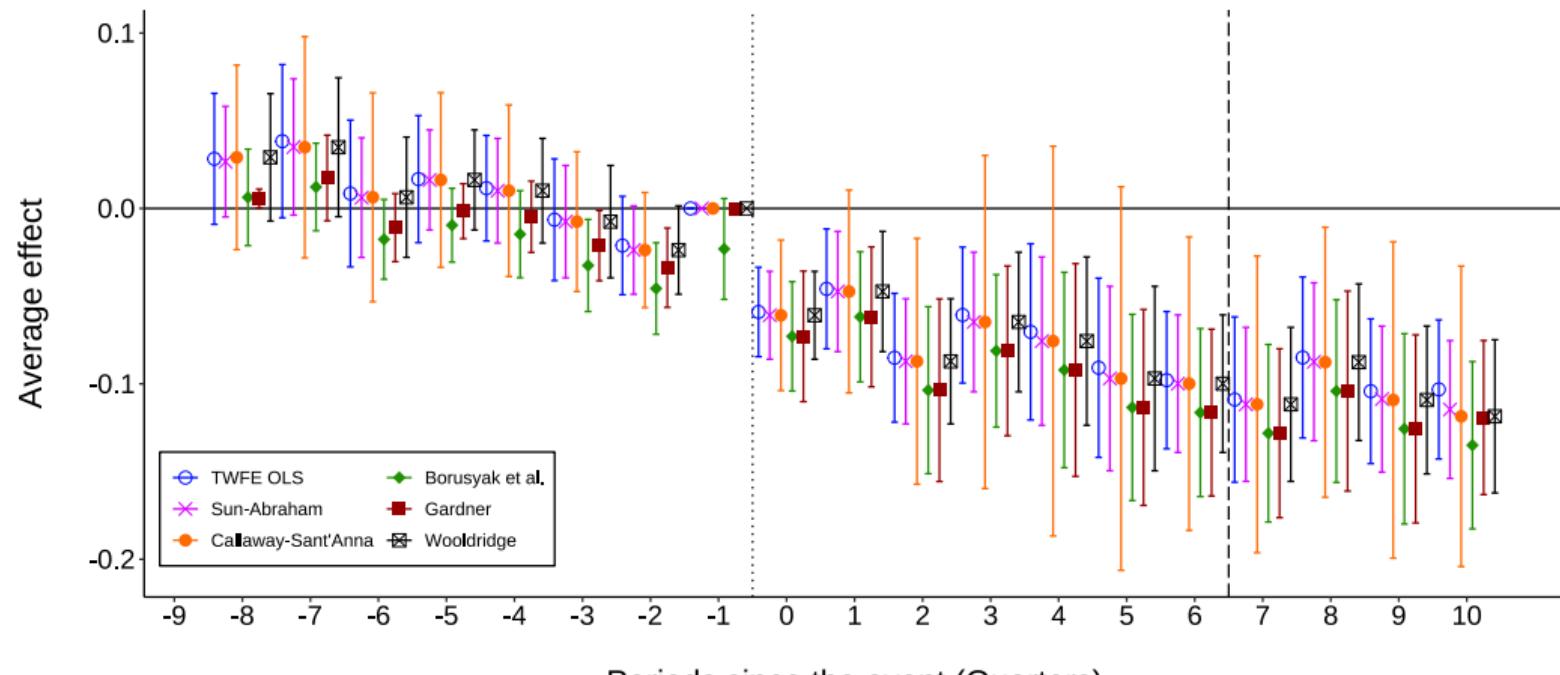


Figure 2: Violent crime

Dynamic Effects: Crime Declined During Construction

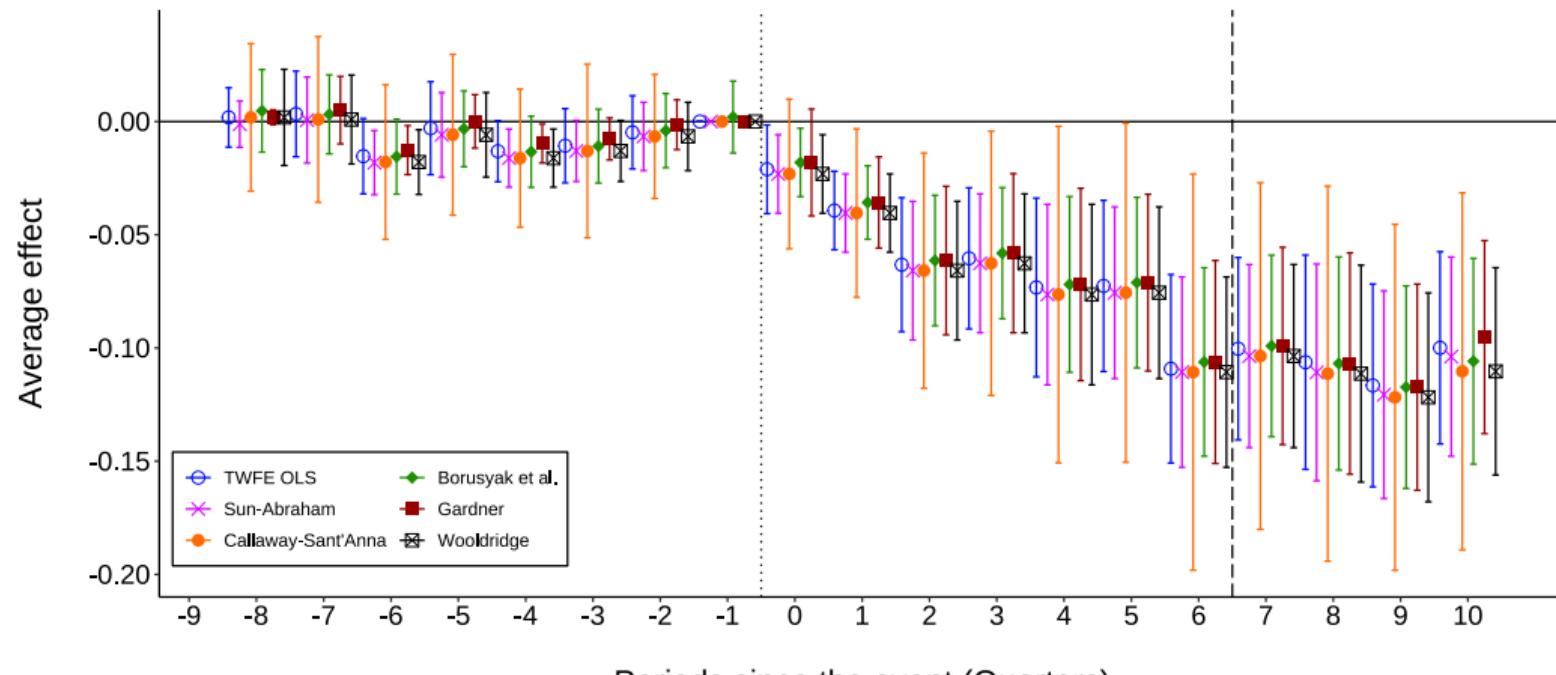


Figure 2: Property crime

Dynamic Effects: Interpretation

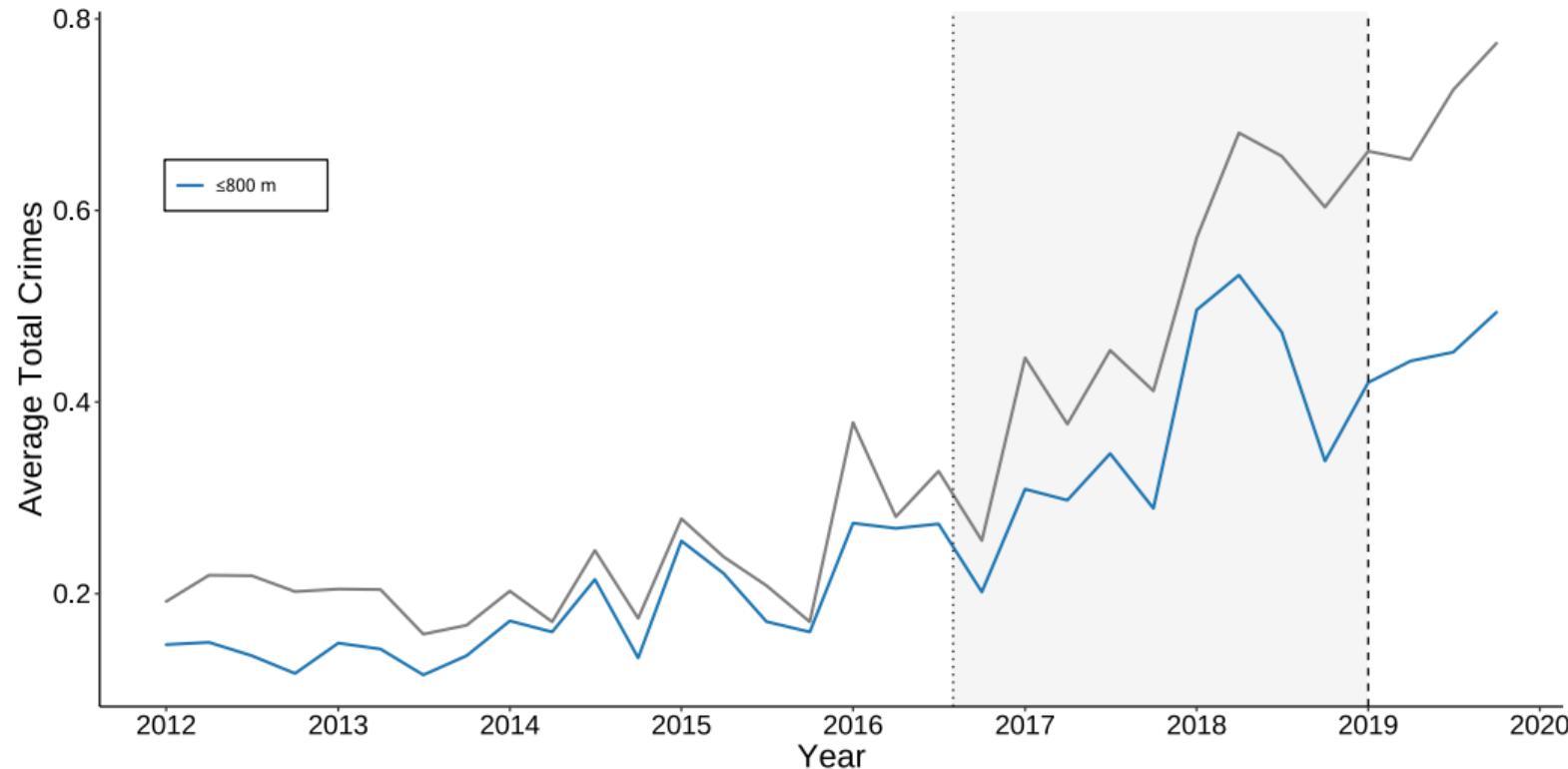


Figure 3: Total crime

Dynamic Effects: Interpretation

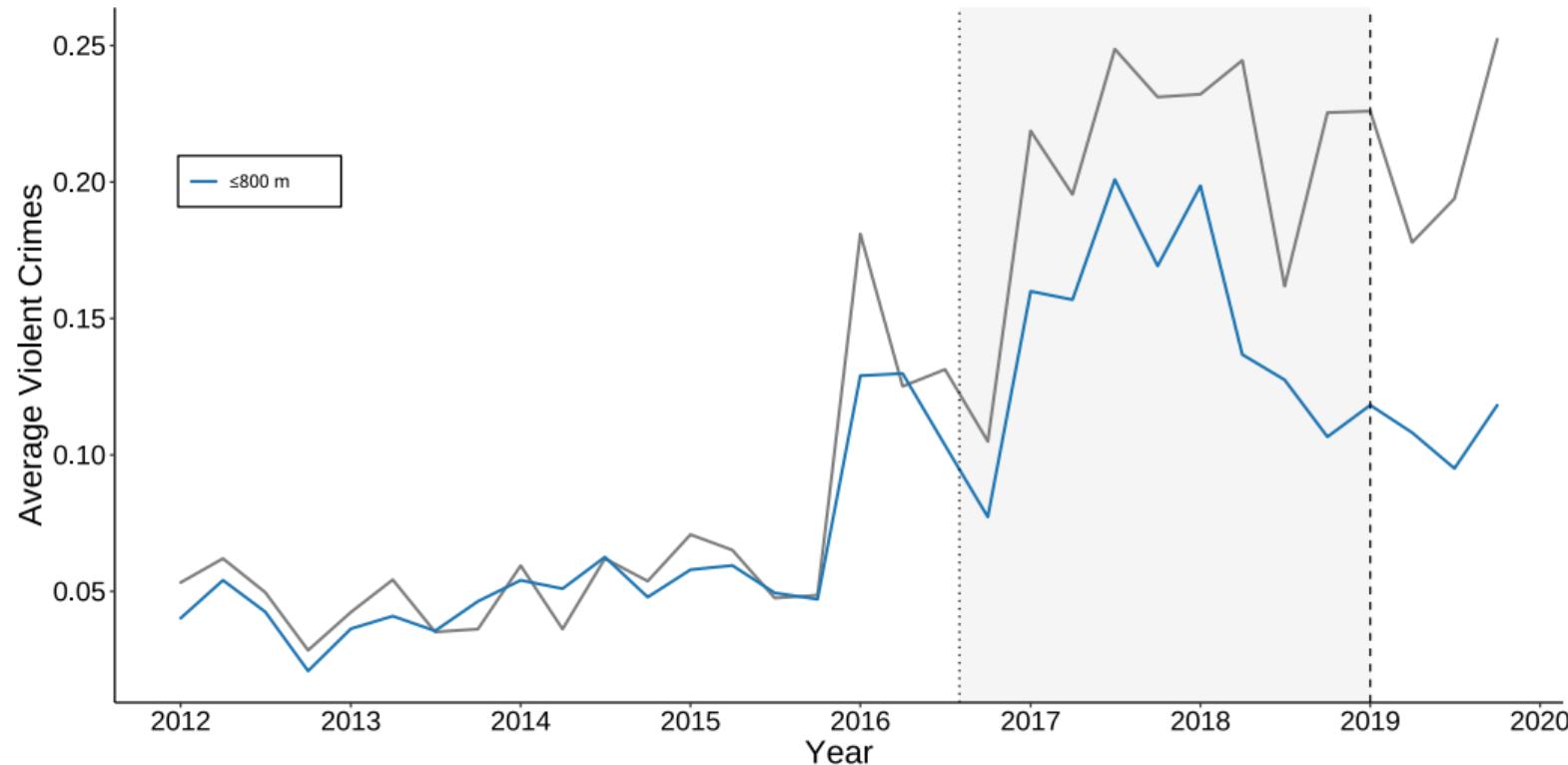


Figure 3: Violent crime

Dynamic Effects: Interpretation

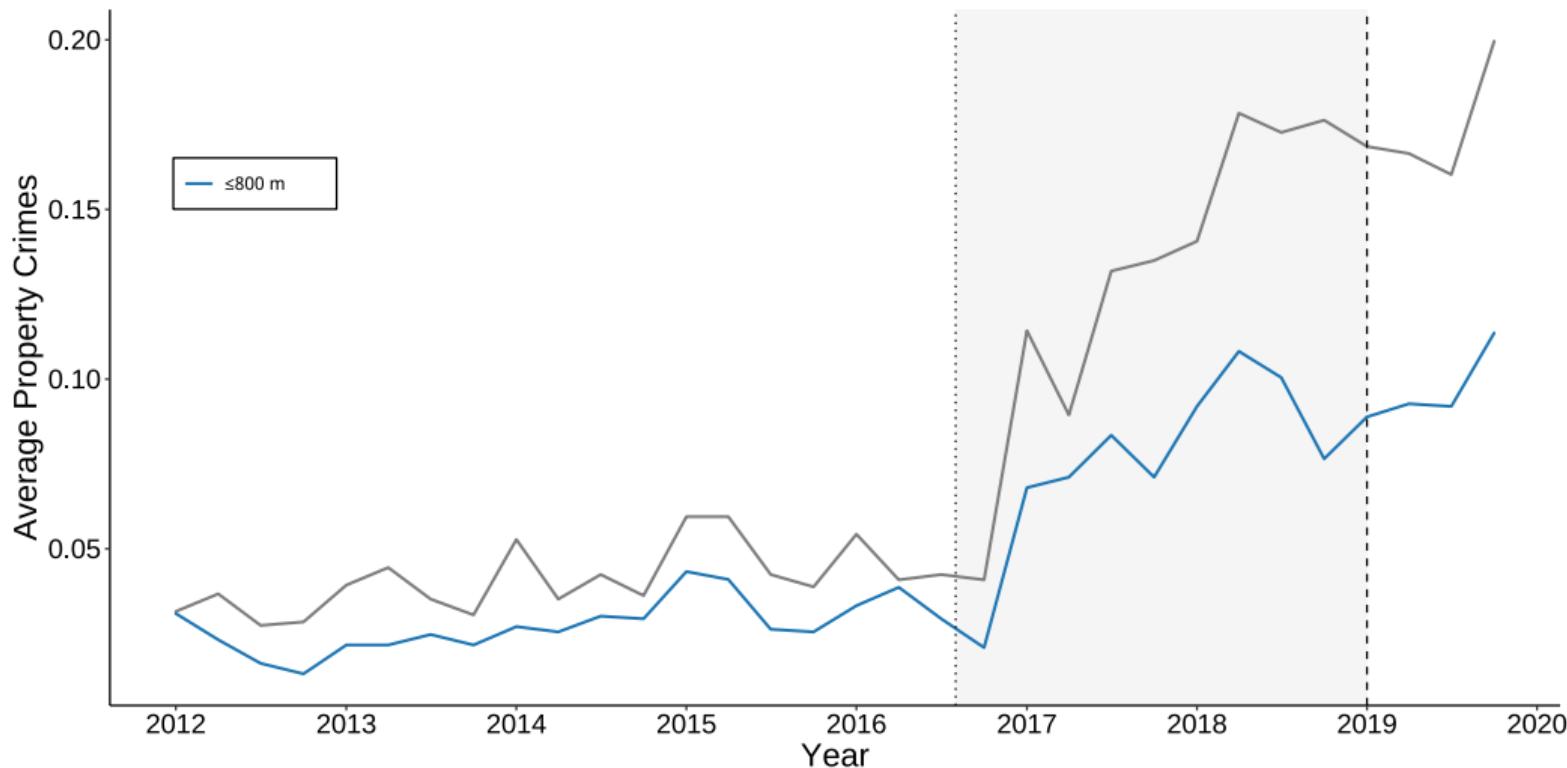


Figure 3: Property crime

Dynamic Effects: Crime Declined During Construction

Event study reveals crime reductions began before inauguration

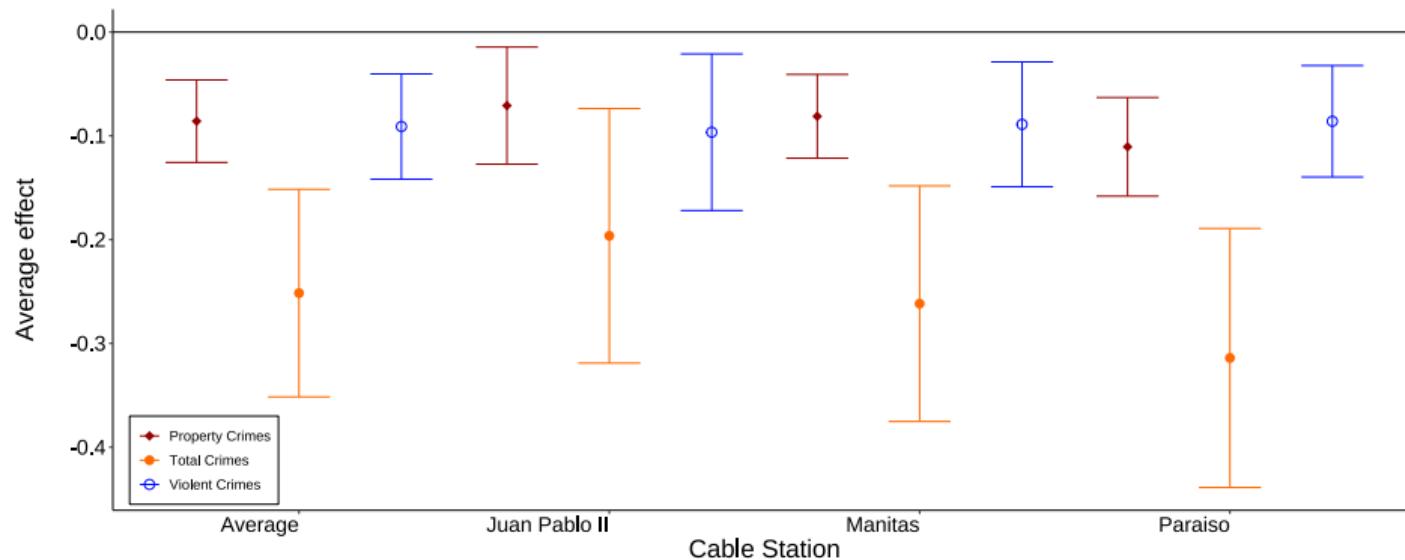
- ▶ Crime starts declining in late 2016 (construction phase)
- ▶ Reductions persist and deepen after inauguration (Q4 2018)
- ▶ Parallel trends hold in the pre-construction period
- ▶ Construction was staggered, so there is potential bias in TWFE estimates.

Interpretation: “Eyes on the street” mechanism

- ▶ Construction introduced visible state presence
- ▶ Increased foot traffic and surveillance around sites
- ▶ Changed perceptions of security
- ▶ Effects not solely from operational transit service

Heterogeneity Across Stations and Space

Effects are consistent across all three stations



- ▶ Juan Pablo II, Manitas, and El Paraíso all show crime declines
- ▶ Despite different physical environments and local conditions
- ▶ Suggests common features of intervention drive results (not idiosyncratic factors)

Crime Displacement

Question: Did crime just move elsewhere?

Two displacement concerns:

1 Local displacement: Crime moved to areas just outside 800m radius

- ▶ We showed a sharp spatial decay up to 800m
- ▶ No evidence of increases at 800m–2000m distance

2 Broader displacement: Cable plus SITP expands offenders' opportunity set

- ▶ TransMiCable brings people down to Tunal
- ▶ Lower travel time and lower risk of being identified mean higher value targets become feasible

Crime Displacement

Question: Did crime move elsewhere?

	Total Crime	Violent Crime	Property Crime
1[Distance Ciudad Bolívar \leq 800m] \times Post Opening	-0.2533*** (0.0541)	-0.0903*** (0.0169)	-0.0774*** (0.0164)
1[Distance Tunal \leq 800m] \times Post Opening	0.7178* (0.3874)	0.2859** (0.1386)	0.2900* (0.1496)
Observations	190,240	190,240	190,240

Crime Displacement

Question: Did crime move elsewhere?

	Total Crime	Violent Crime	Property Crime
1[Distance Ciudad Bolívar \leq 800m] \times During Construction	-0.1461*** (0.0411)	-0.0840*** (0.0191)	-0.0544*** (0.0129)
1[Distance Tunal \leq 800m] \times During Construction	0.4122* (0.2260)	0.2277** (0.1011)	0.1937** (0.0938)
1[Distance Ciudad Bolívar \leq 800m] \times Post Opening	-0.3284*** (0.0677)	-0.1172*** (0.0211)	-0.0906*** (0.0196)
1[Distance Tunal \leq 800m] \times Post Opening	0.9045* (0.5012)	0.3163* (0.1665)	0.3236* (0.1834)
Observations	190,240	190,240	190,240

Crime Displacement

Question: Did crime move elsewhere?

What we have shown

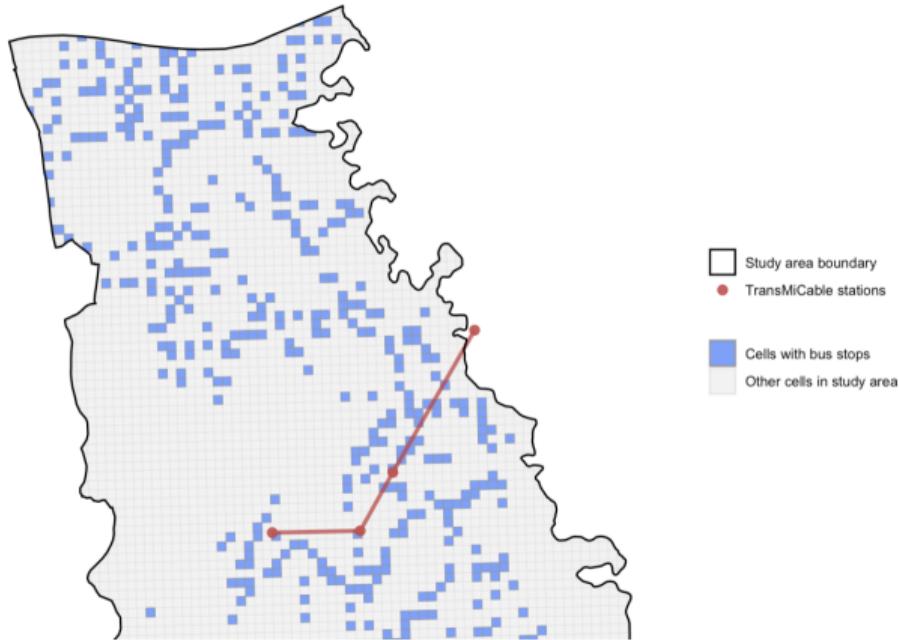
- ▶ Within 800 m of the Ciudad Bolívar stations, crime declines after construction and opening.
- ▶ There is a displacement to Tunal Station

Additional concern

- ▶ The cable channels people into Tunal, but mobility inside the area is completed with SITP stops.
- ▶ If offenders ride the same local network, bus stops can become the new crime hotspots.
- ▶ Close to the station there are more eyes on the street, so guardianship is higher.
- ▶ If crime is being pushed out, we should see effects at SITP stops that are still in the cable catchment but further away from the high guardianship area.

Crime Displacement

100 × 100 m. cells with bus stops (blue), TransMiCable stations (red)



Displacement: Event-Study Design

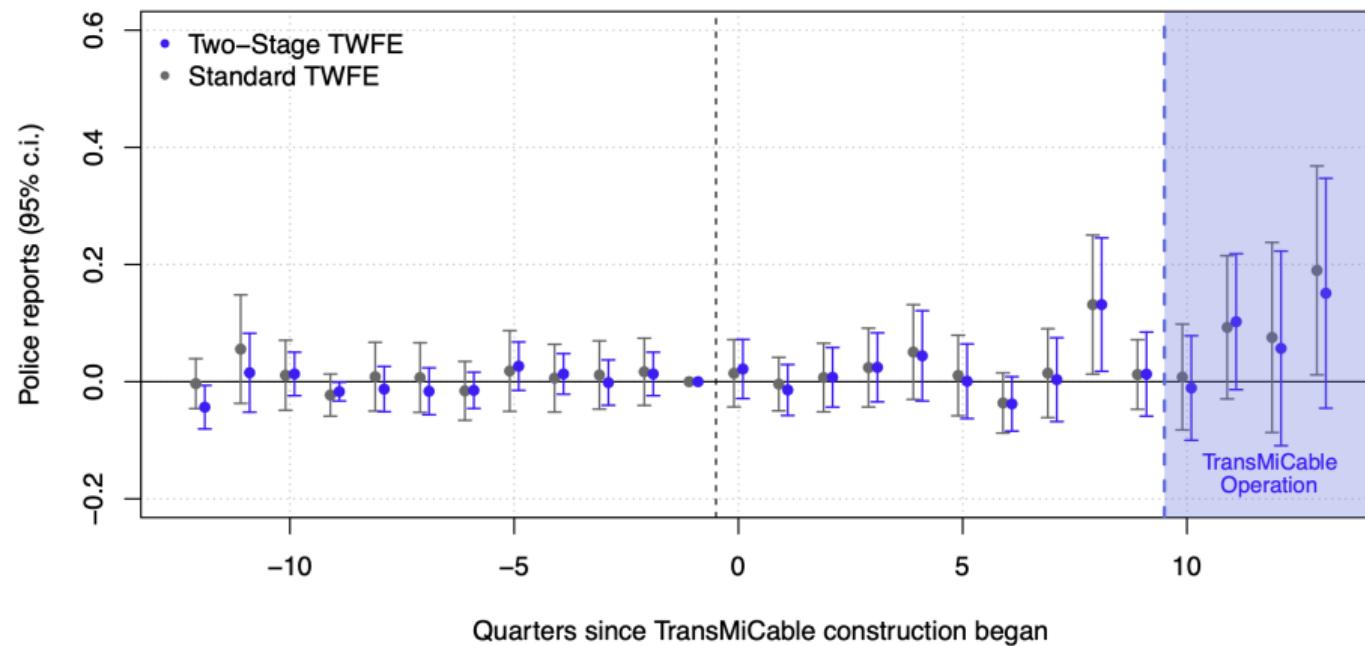
$$Thefts_{jt} = \mu_j + \eta_t + \sum_k \tau^k D_{jt}^k + \varepsilon_{jt},$$

- ▶ Treated units D : cells with bus stops (*componente zonal*).
- ▶ Staggered adoption due to construction ($t = 0$).
- ▶ Dynamic specification for treatment heterogeneity (Gardner et al., 2025).
- ▶ μ_j grid fixed effects
- ▶ η_t time fixed effects

Displacement: Impact on Reported Thefts at Local Bus Stops

< 0.5 km from a TransMiCable Station

Impact on Reported Thefts at Local Bus Stops
(Ciudad Bolívar, < 0.5 km from a TransMiCable Station)

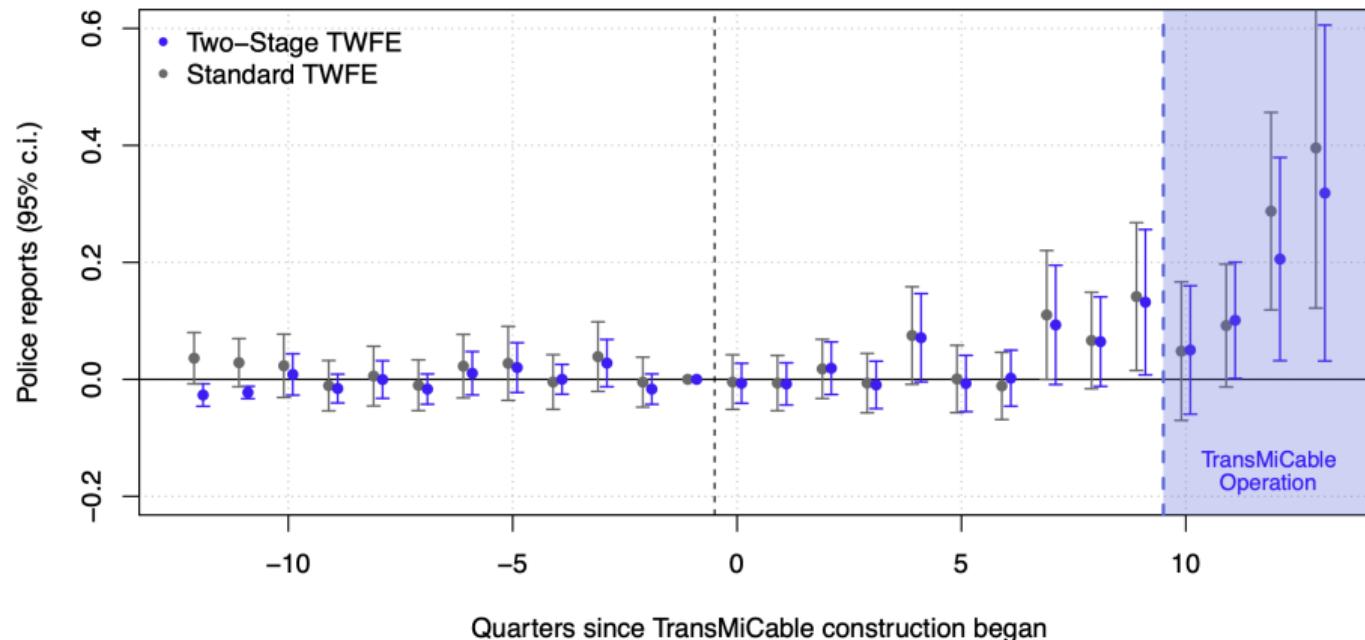


Displacement: Impact on Reported Thefts at Local Bus Stops

0.5 – 1.5 km from a TransMiCable Station

Impact on Reported Thefts at Local Bus Stops

(Ciudad Bolívar, 0.5–1.5 km from a TransMiCable Station)

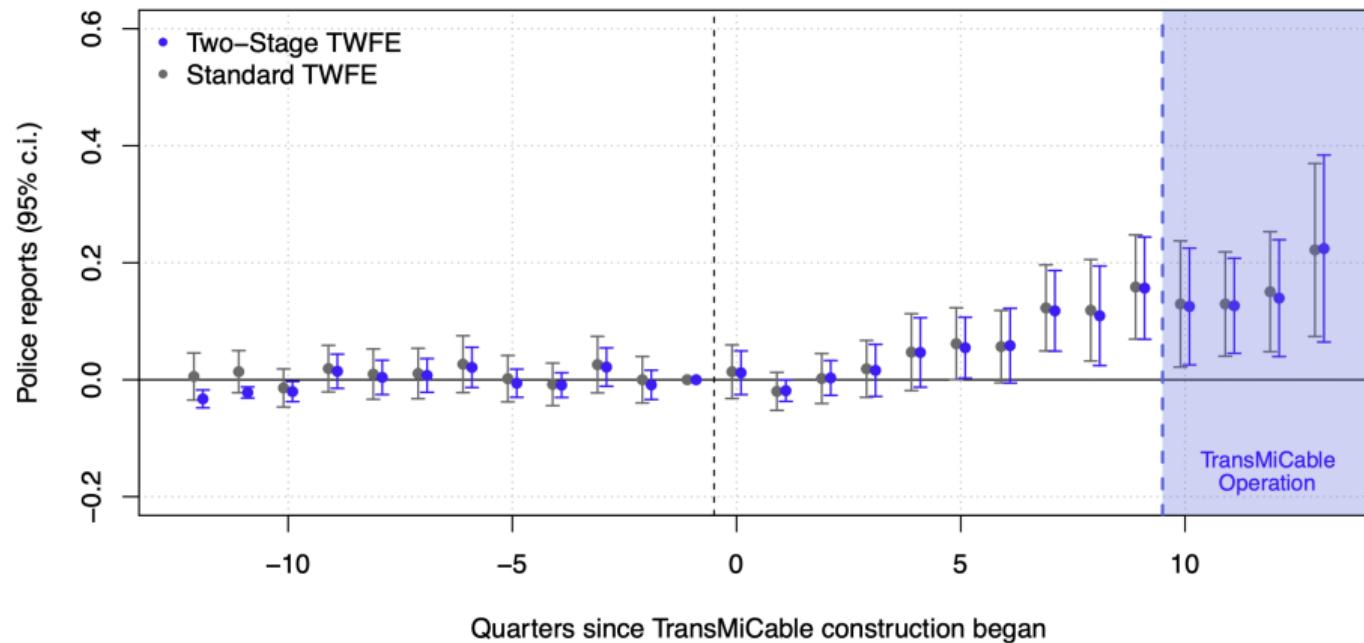


Displacement: Impact on Reported Thefts at Local Bus Stops

1.5 – 3.0 km from a TransMiCable Station

Impact on Reported Thefts at Local Bus Stops

(Ciudad Bolívar, 1.5–3.0 km from a TransMiCable Station)

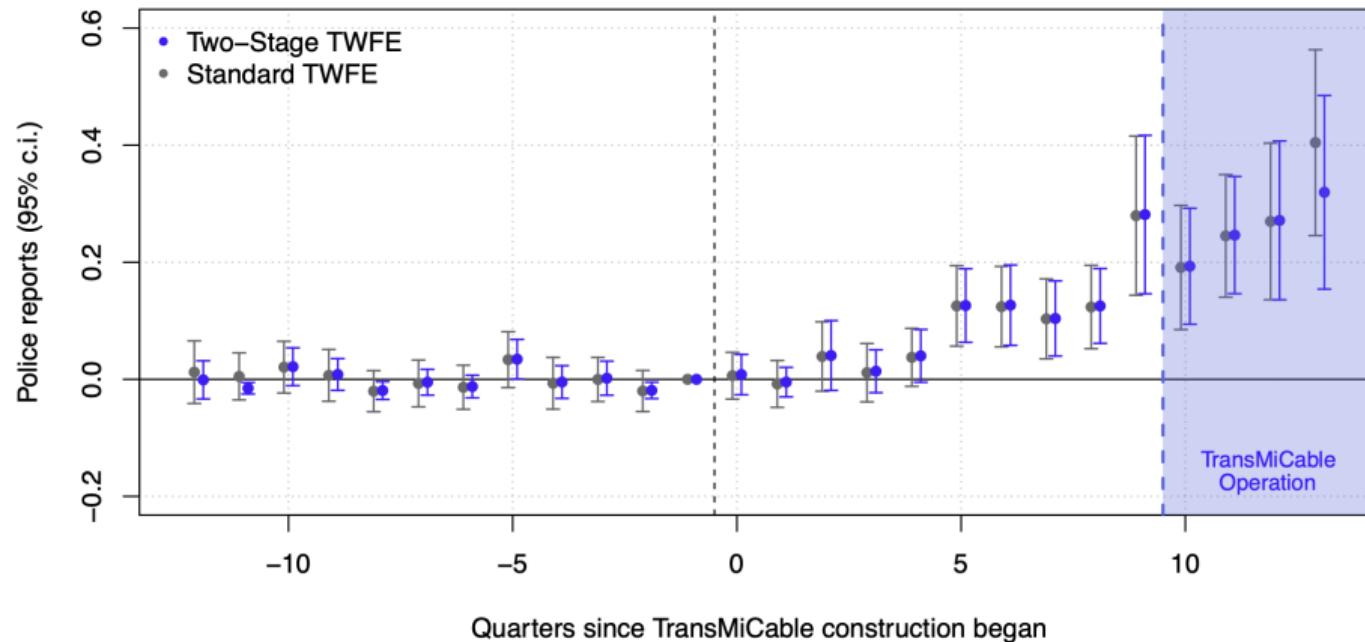


Displacement: Impact on Reported Thefts at Local Bus Stops

> 3.0 km from a TransMiCable Station

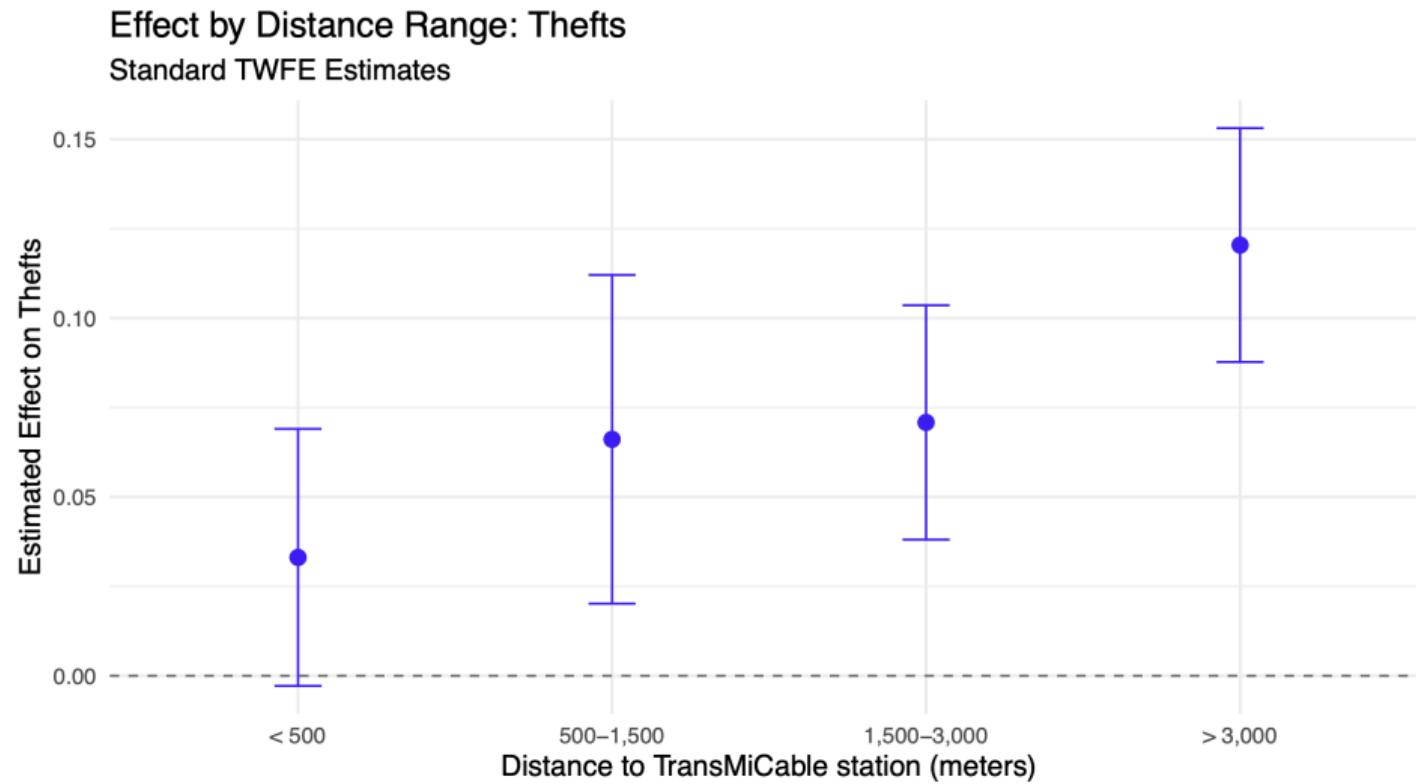
Impact on Reported Thefts at Local Bus Stops

(Ciudad Bolívar, > 3.0 km from a TransMiCable Station)



Displacement: Impact on Reported Thefts at Local Bus Stops

Distance Gradient



Conclusion

Main findings

- ▶ TransMiCable lowered crime within 800 m of the hillside stations, starting in construction and persisting after opening.
- ▶ The Tunal terminal is different: crime rises there once the system is operating, consistent with higher target density and easy exit.
- ▶ We also detect increases in crime at nearby SITP stops outside the cable catchment when comparing grid cells with and without a stop at the same distance from the cable.
- ▶ So, the dominant mechanism near stations appears to be "more eyes on the street"; however, at large transfer points, the opportunity channel can dominate.

Conclusion

Policy implications

- ▶ Transit infrastructure can produce local crime reductions without the need for policing, but the effect is not uniform throughout the network.
- ▶ Transfer hubs and feeder-bus stops that absorb the inflow need specific security/guardianship measures.
- ▶ Designing the network to spread flows, lighting, and formal surveillance can help maintain the beneficial effect downstream.

Contribution: Evidence from a large-scale cable-transit investment in a low-income area, showing both local crime reductions and networked displacement effects.

Thanks!

Ignacio Sarmiento-Barbieri
Universidad de los Andes

i.sarmiento@uniandes.edu.co
ignaciomsarmiento.github.io

Change in Recordings

Placebo test using future expansion site

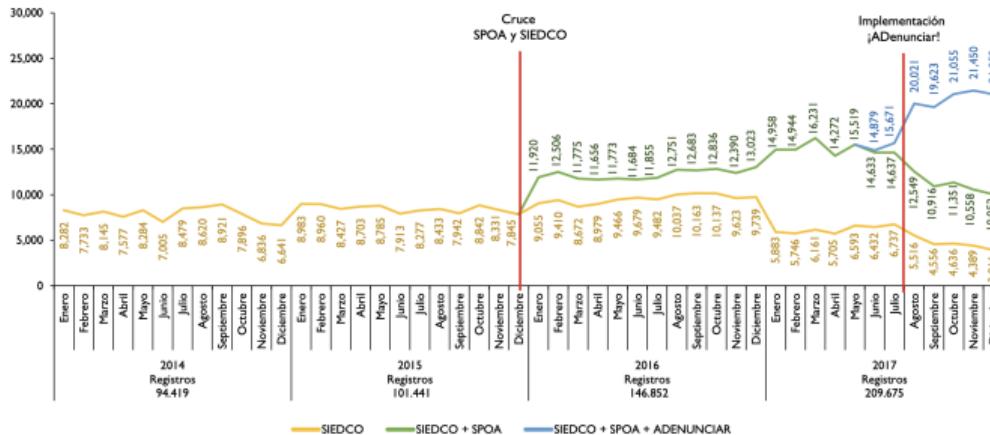


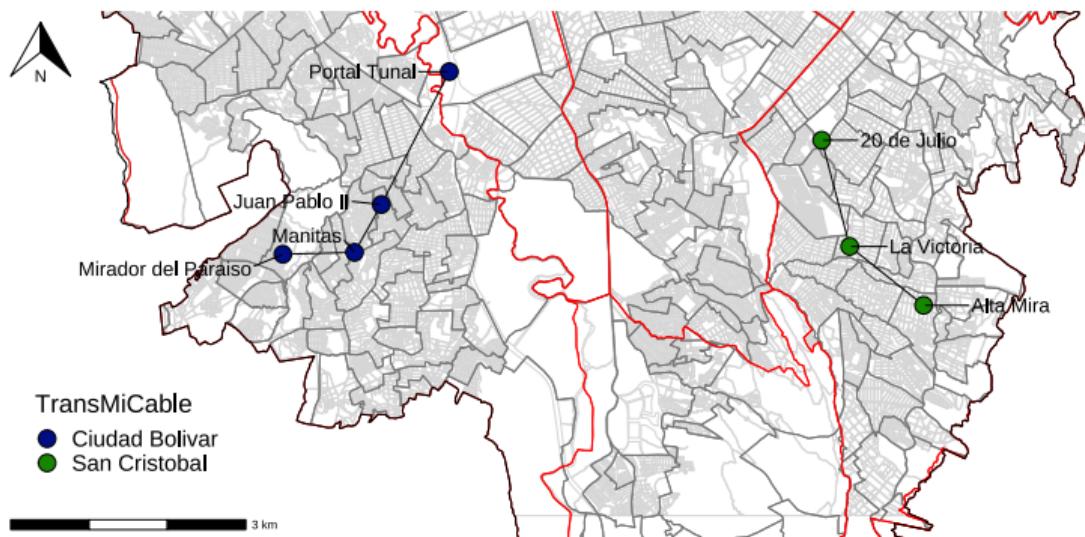
Figura 7. Cantidad de hurtos a personas según fuente de la información, Colombia, 2014-2017 (mensual)

Fuente: Policía Nacional (2018). Elaboración propia.

Reproduced from Rodríguez, J. D., Mejía, D., Caro, L., Romero, M. & Campos, F. (2018). Implicaciones del proceso de integración de los registros administrativos de criminalidad entre el SPOA de la Fiscalía General y el SIEDCO de la Policía Nacional de Colombia, y la puesta en marcha del aplicativo “¡ADenunciar!” sobre las cifras de criminalidad. Revista Criminalidad, 60 (3): 9-27.

Robustness: Triple Differences with San Cristóbal

Placebo test using future expansion site



- ▶ San Cristóbal: Similar peripheral area designated for future TransMiCable
- ▶ No construction during study period
- ▶ Comparable to Ciudad Bolívar: high crime, low transit access, socioeconomically disadvantaged

Robustness: Triple Differences with San Cristóbal

Placebo test using future expansion site

