



CHESTNUT STREET EAST

(BROAD ST TO 2ND ST)

Evaluation Report

February 2024





BUS LANE EVALUATION REPORT

CHESTNUT STREET EAST (BROAD TO 2ND ST)

Project Background

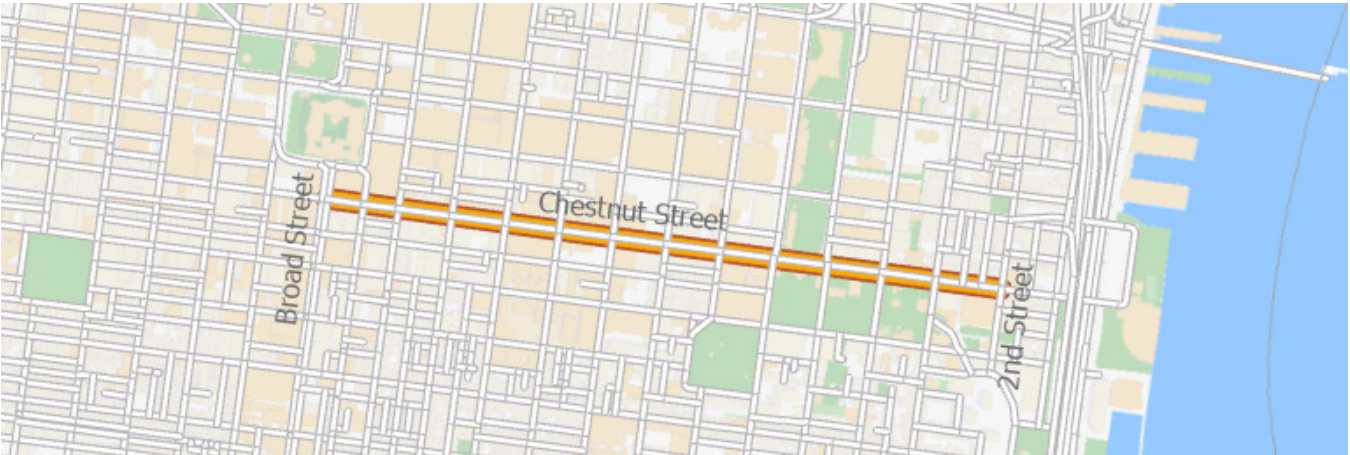
Chestnut Street is both one of Center City’s main commercial corridors and a significant east-west transit corridor. This project painted a red bus lane on the section of Chestnut Street from Broad St to 2nd St (“Chestnut East”), spanning the Old City and Washington Square West neighborhoods. The goal of the project was to improve bus speeds and reliability through the corridor by deterring illegal stopping of cars and trucks in the bus lane.

What: Red Bus Lane Project on Chestnut Street (SEPTA Routes 9, 21, 38, 42)

Where: Chestnut Street from Broad Street to 2nd Street

Why: Improve bus speeds and reliability on one of the city and region’s most important bus corridors.

Who: This project was a collaboration between the City of Philadelphia, SEPTA, and PennDOT.



SUMMARY OF FINDINGS

Bus Lanes Improved Bus Travel Times

The bus travel time on Chestnut East decreased by 12 percent after the bus lane was painted red. In comparison, in the same time period, bus travel times on other routes in Center City Philadelphia increased by roughly four percent. The total time saving across all riders on Chestnut East is 35.2 hours per day.



12%
faster travel times
on Chestnut East

**Hours saved daily
across all Chestnut
East riders: 35.2**

53%
**Decrease in double parking +
no stopping violations in the
bus lane**

Parking/Stopping Violations Decreased with Red Paint

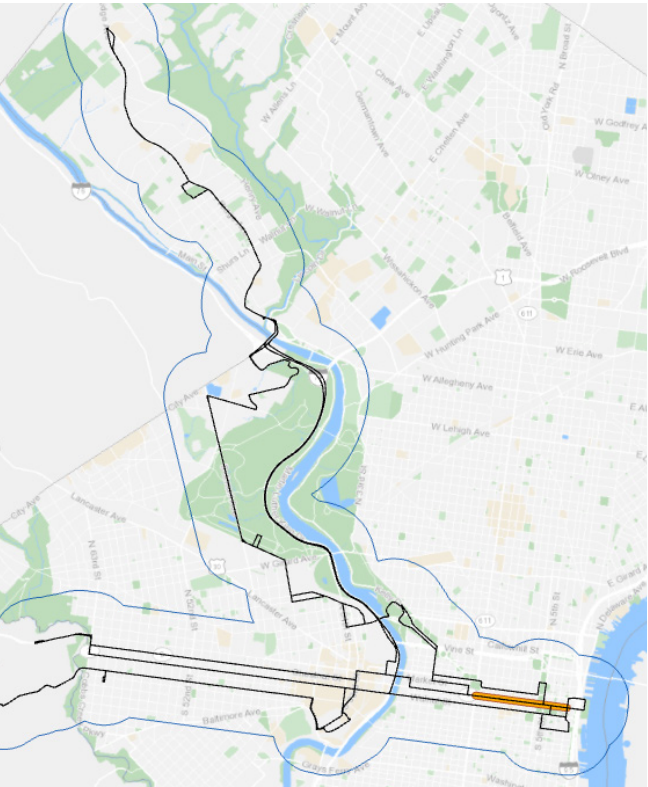
PPA analysis of issued tickets found that after installing red paint in June 2022, double parking and stopping in bus lane violations decreased by 53 percent by September 2022. In comparison, the same violations increased by over 250 percent on unpainted Chestnut West.

Traffic is Still Flowing

The project team worked to ensure that a faster bus lane did not create a slower general traffic lane. Overall traffic travel time on Chestnut East also sped up by roughly 12 percent, which does suggest greater travel patterns that positively affected Chestnut East as a whole. It is clear, though, that adding red paint did not detract from this positive effect.

12%
**Reduction in overall travel
time on Chestnut East from
2019-2022**

PROJECT OVERVIEW



Chestnut East Corridor Benefit Area
Where Buses on this Corridor Go

Background

Chestnut Street is a key east-west street and transit corridor in Center City, and sees a high level of traffic in its 26-ft cartway. This includes SEPTA bus routes 9, 21, 38, and 42, which extend deep into West and Northwest Philadelphia. These routes combined reach roughly 200,000 residents, 20% of whom take public transit to work. Although the right lane of Chestnut is designated “Bus Only”, buses are frequently blocked by private vehicles, ride-hailing, and delivery activity, forcing them to go around by shifting lanes, further slowing down traffic. This project builds upon prior initiatives to reduce illegal stopping and manage loading & parking on Chestnut, including:

- Installing all-day loading zones from 6th St to 20th St
- Piloting an app-based smart loading zone system in Washington Square
- PPA no-stopping enforcement “blitzes” conducted periodically since 2019

Partner agencies reached out to drivers about the upcoming project to warn drivers of upcoming painting and enforcement.

Why Bus Lanes?

The 2021 Philadelphia Transit Plan establishes transit-first priority corridors throughout the city, including adding and improving bus lanes. Chestnut Street in Center City is a “Tier 1” priority corridor for transit improvements, including speed, reliability, and better connections. As shown in the corridor benefit area map (left), long-distance trips originating from West and Northwest Philadelphia are also improved.

Red paint in bus lanes deters unauthorized driving, idling, and parking, and has been deployed extensively in other cities to much success. Chestnut Street also remains important in SEPTA’s upcoming bus network redesign, Bus Revolution. It will maintain high-frequency service on Chestnut, and increase mid-day service.

PROJECT OVERVIEW

Implementation & Timeline

PennDOT repaved Chestnut Street from Broad Street to 2nd Street in Fall 2021, and red paint and bus and bike-only markings were added in May and June 2022. At every other intersection, the shared right-turn and bus lane is maintained by using a dashed striping pattern.



Collaboration & Engagement

Painting the Chestnut east bus lane was a collaboration of the City of Philadelphia, PennDOT, and SEPTA. The cost was split between the three agencies. The PPA and PPD were also integral to educating and enforcing drivers about no stopping on Chestnut, and the officers continue a high level of enforcement today.

Engaging affected road users and nearby stakeholders was a priority. These included:

- Center City District
- Registered community organizations (RCOs)
- Local business representatives

Stakeholders were provided with information and project materials to share with their local networks. News about the red bus lane was shared with media outlets, City press releases, and social media.

EVALUATION

Methodology

To evaluate bus travel times, two street sections were primarily compared:

- Chestnut East from Broad Street to 2nd Street with red paint
- Chestnut West from 23rd to Broad Street which lacks paint

These two sections were comparable because they have the same road widths and bus routes, and have similar lengths, bus ridership, and business activity.

Additionally, parallel Walnut Street was also compared for general traffic volumes.

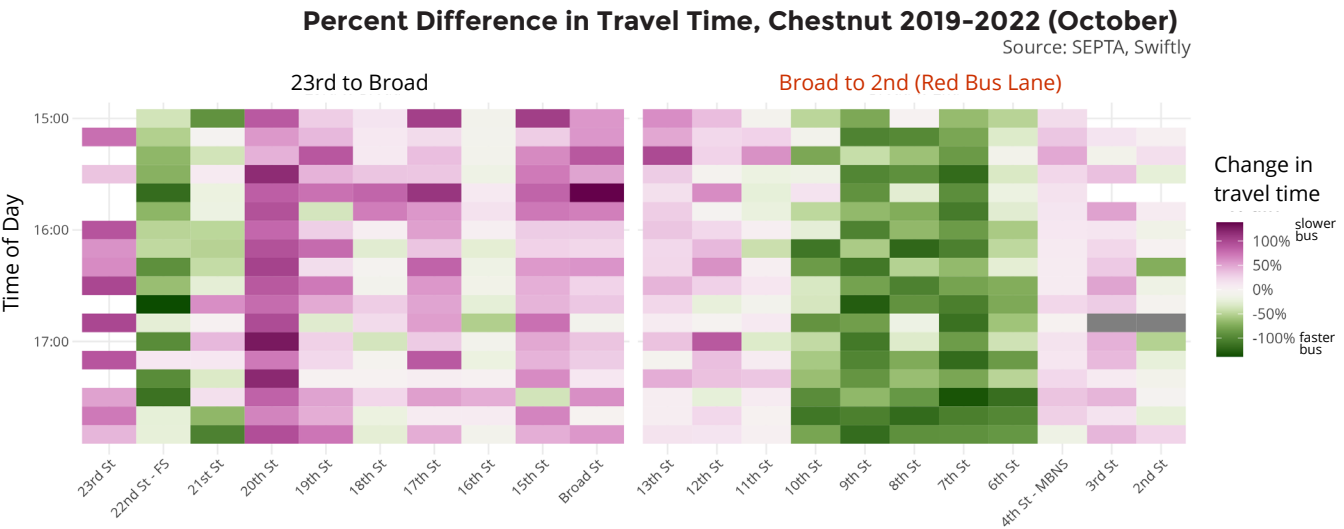
A “before” red paint and “after” red paint time period was established, and the percent difference in running times was visualized. This period is an average of all Tuesdays, Wednesdays and Thursdays in October 2019 compared with those in October 2023¹. Finally, the analysis focused on travel times at the afternoon peak (3:00-6:00PM).



¹Using data as recent as possible is important, as only in 2023 has post-pandemic ridership recovered to 90-100 percent of pre-pandemic ridership for SEPTA city bus routes, including on Chestnut Street.

EVALUATION: TRANSIT RESULTS

Bus travel times improved on Chestnut East, worsen on unpainted Chestnut West

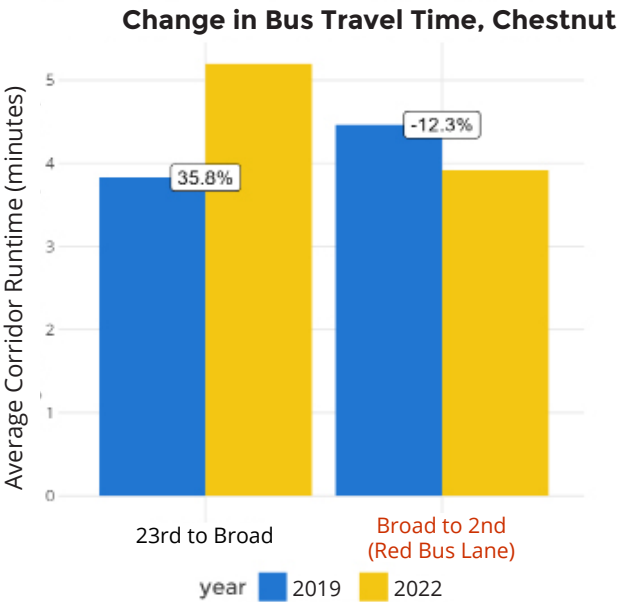


The resulting heatmap of stop-to-stop travel time difference shows a marked decrease in travel times from 10th Street to 6th Street, with minimal increase elsewhere on Chestnut East.

In comparison, most blocks on Chestnut West worsened in travel time. (The improvement on 22nd and 21st Streets is attributed to the reopening of the Chestnut Street bridge after 2019.)

Overall 12.3% time savings on Chestnut East

All stops and timepoints were aggregated to produce a single number for percent change in travel times: **12.3% speedup** on Chestnut East before and after the bus lane, compared with **35.8% slowdown** on Chestnut West². This is a savings of ~30 seconds for each bus; when aggregated for all riders³, this comes to as much as **35.2 hours per day**.



²Only travel time when the bus is moving was measured for this analysis. Dwell time at stops and traffic signals was not counted to further reduce variability due to exogenous factors.
³Based on 4220 people getting off at Chestnut East stops per day in Fall 2022.

EVALUATION: TRANSIT RESULTS

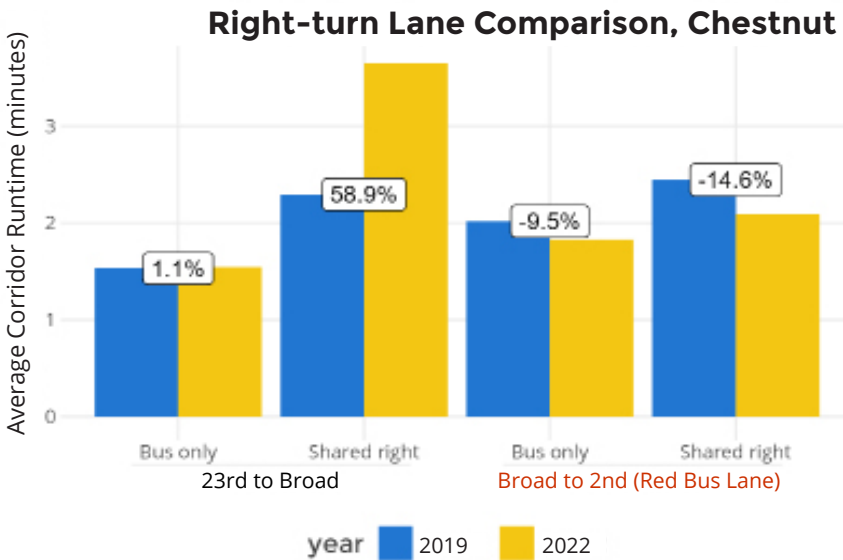
Red paint greatly improves combined right-turn blocks

Due to Center City’s one-way street grid, half of Chestnut Street blocks have a shared right-turn lane mixing general traffic with the bus lane. For example, Chestnut at 7th Street is bus-only, while 12th Street it is shared-right. The chart below further breaks down the overall percent change chart by whether the block is bus-only or shared-right.

The results show an even starker contrast for both halves of Chestnut. For Chestnut West, nearly all delay increases occur in shared-right blocks, while for Chestnut East, there is even a slight improvement for shared-right blocks over bus-only. This demonstrates the importance of red paint in narrow corridors to ensure vehicle compliance.



A “bus-only” block at 7th Street (left) and a “shared-right” block at 12th Street (right)
(Source: Cyclomedia)

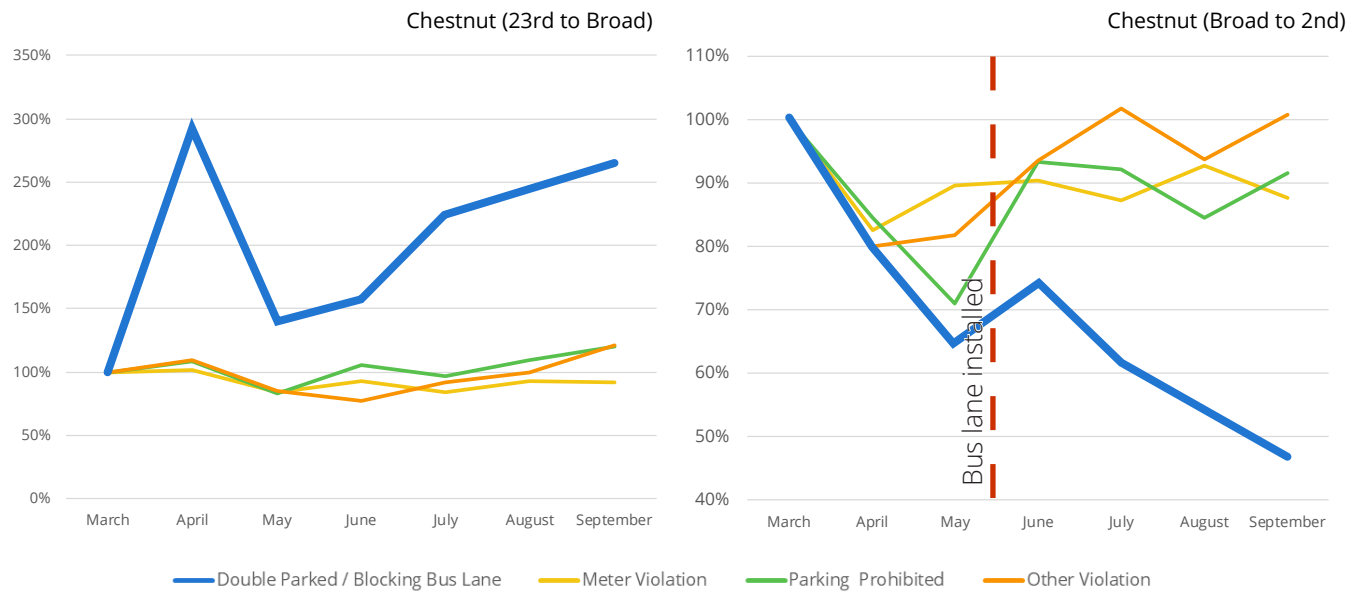


EVALUATION: TRAFFIC & PARKING RESULTS

PPA parking/stopping violations decreased on Chestnut East after installing the bus lane

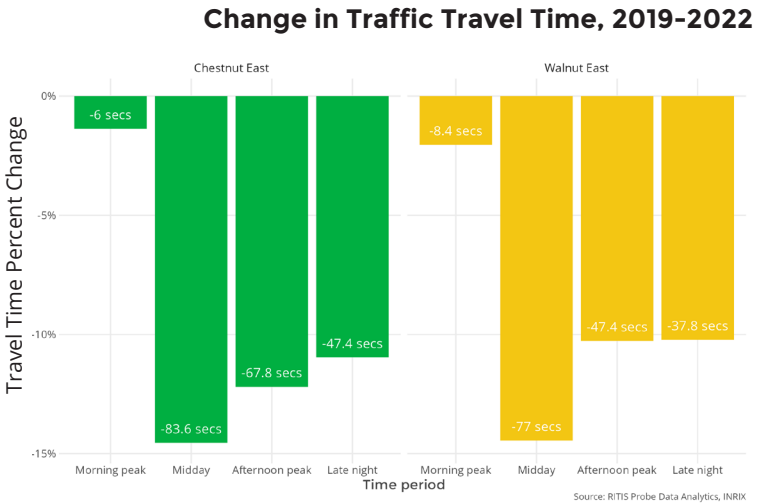
The Philadelphia Parking Authority (PPA) tracked parking and stopping violations it issued before and after bus lane painting. This window of violations data occurred before the publicized enforcement “blitz” in late September 2022, and represents a typical level of enforcement by PPA. Setting March 2022 as the baseline, the below graphs chart violations issued by month, broken down by type. The blue

line groups together Double Parked, No Stopping, and Bus Only Zone violations which the red paint is meant to deter. While other violation types remained near 90-100% by September 2022, double parking/lane blockage decreased by a massive **53%**. Chestnut West saw a 250% increase in lane blockage, which suggests that red paint was the critical factor in deterring cars from blocking the bus lane.



Traffic is still moving

To ensure that the red paint was not adversely affecting general traffic, travel time data was analyzed at 4 times of the day for before and after periods. When comparing Chestnut East with Walnut East⁴, travel time decreased at similar rates on both corridors.



⁴Walnut was used instead of Chestnut as traffic patterns on either side of Broad are more similar to each other.

NEXT STEPS

Summary and Next Steps

This report finds that red bus lanes on Chestnut East significantly reduced travel time and traffic violations for blocked bus lanes. This saves an average of 30 seconds on every trip, adding up to thousands of hours of yearly savings collectively. By speeding up service in the congested core, a faster Chestnut East benefits riders across the City travelling to and from Center City.

Along with bus travel time improvements, this report finds that there have been no adverse travel time impacts for drivers along Chesnut East. Compared to pre-pandemic travel speeds, trips on Chestnut East are over a minute faster at midday and are over 40 seconds faster in the afternoon and evening. Similar trends are seen on parallel corridors in Center City.

The City will continue to impement bus transit corridor priority laid out by the 2021 Transit Plan. Corridors like Chestnut Street will continue to receive upgrades like automated camera enforcement of bus lanes, stop rebalancing & shelters, and extending the bus lane to Chestnut West along with repaving.



Post-Project Plans

- Automated bus lane enforcement, spring 2025
- Rebalance stops and evaluate far-side stop placement with new bus network (2025-2026)
- Install red paint on Chestnut West (23rd St to Broad St) with next PennDOT repaving (2025)