Office of Multimodal Planning

Memorandum

March 12, 2025

To: Kelley Yemen, AICP
From: Adam Smith, PE, PTOE
CC: Jeannette Brugger, AICP
Subject: **3rd Street (South – Market) Traffic Study**

Executive Summary

The removal of one travel lane on 3rd Street between South Street and Market Street is reasonable and is not anticipated to have detrimental traffic impacts. While occasional traffic delays might occur when vehicles stop within the travel lane, typical traffic impacts would be minimal given the low Average Annual Daily Traffic (AADT) and peak hour traffic volumes. These traffic volumes are well below the capacity which a single travel lane can comfortably handle.

Project Proposal

In 2024, legislation was passed to designate the lefthand travel lane on 3rd Street between South Street and Market Street as a bike lane. The 3rd Street Bike Lane project will implement this designated bike lane with separation, including a painted buffer and flexible delineator posts. An example block can be seen below.

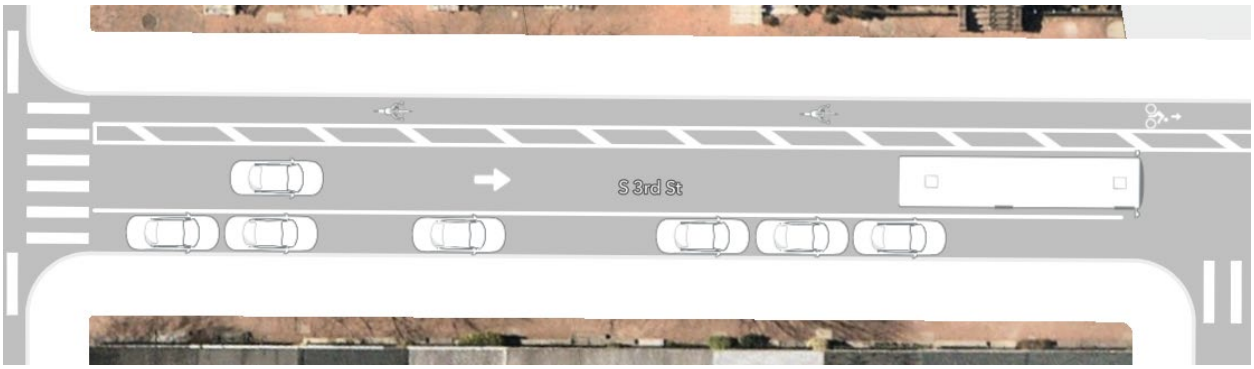

Figure 1: Remix conceptual plan

Traffic Analysis

Traffic data was compiled from PennDOT's Traffic Information Repository (TIRe). This included current year average daily traffic (AADT) data and historical AADT data dating back to 2000. All AADT data was taken on 3rd Street between Spruce Street and Locust Street.

This current year data is summarized below:

Current AADT	4,969
Truck Percent	5%
K-factor	11%
D-factor	100%
T-factor	3%

An AADT of 4,969 can be comfortably handled by one travel lane. Some examples of comparable one-lane streets nearby include the following corridors (count location in parentheses):

- 2nd Street (Wood-Vine): 6,559
- Pine Street (6th-5th): 6,093
- Passyunk Avenue (Dickinson-Reed): 5,644
- 22nd Street (Tasker-Dickinson): 5,207

From the data in the above table, the Design Hourly Volume (DHV) was calculated by multiplying the AADT by the K-factor, which yields a DHV of 547. The DHV equates to the 30th highest hourly traffic volume of the year. The City used an overly conservative method of determining the needed capacity for vehicle operations. Based on methodology from the Highway Capacity Manual, a single travel lane can handle a volume of 547 vehicles in an hour, with the current traffic signal green time on 3rd Street. Supporting calculations can be found below:

- Approximate capacity of a single lane = 1800 passenger cars per hour per lane (pcphpl), per the Highway Capacity Manual
- Current percentage of green time for 3rd Street at Locust Street (location of available traffic count): 19 seconds of green time from 60-second signal cycle = 19/60 = 32%
- 32% x 1800 pcphpl = 570 pcphpl

While peak hour operations are traditionally the focus of traffic analysis, this approach disproportionally favors the movement of vehicles in the peak hour of the day over the safety and mobility of all road users throughout the rest of the day. NCHRP Report 1036 (Roadway Cross-Section Reallocation: A Guide), released in 2023, outlines a 24-Hour Capacity Framework which seeks to reconsider how we determine street cross-section decisions. This approach balances consideration of peak hour vehicle capacity vs. negative safety impacts of providing excess vehicle capacity outside of the peak travel hours. The 24-Hour Capacity Framework was also used to analyze the 3rd Street corridor with the AADT data and current signal timings. The graph below shows the hourly vehicle demand compared to the capacity of various street cross-sections.

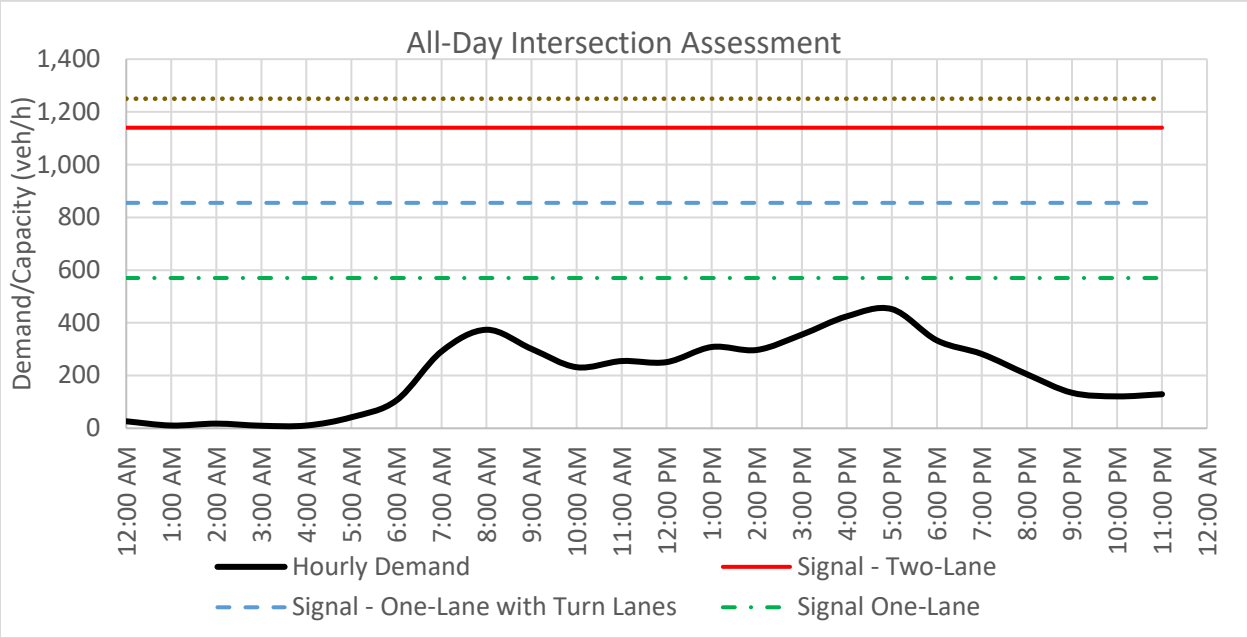

Figure 2: 24-Hour Capacity Framework - 3rd Street @ Locust Street

In summary, we do not have any traffic operations concerns related to the reconfiguration of 3rd Street from two travel lanes to one travel lane.