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The Chinatown Stitch

重塑費城萬安街

Reconnecting Philadelphia's Vine Street

VISION REPORT

December 19, 2023

City of Philadelphia

PCDC 費城華埠發展會
PHILADELPHIA CHINATOWN DEVELOPMENT CORPORATION

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Chinatown community and surrounding neighborhoods have long suffered the ill effects of the Vine Street Expressway I-676. Significant portions of the neighborhood were demolished, displacing residents and businesses when Vine Street was first widened in the 1950s and again when the expressway was constructed in the late 1980s and early 1990s. The harm did not stop there. With over 100,000 vehicles a day passing through one of the most vibrant mixed-use neighborhoods in Philadelphia, the Vine Street Expressway causes daily and chronic problems for residents and visitors alike. These harms include traffic crashes, threats to pedestrian safety, traffic congestion, and air and noise pollution. Clearly, an infrastructure solution is needed to address these harms.

The community spent decades searching for solutions that address the harm caused by the Vine Street Expressway. Since 2005, several studies proposed a “cap” over the expressway as a solution that could significantly address historic harms. A cap is a wide cover or bridge that would contain green space and other amenities, reducing the impact of the expressway. Combined with traffic calming on the local lanes of Vine Street, a cap can achieve longstanding community goals. But, none of these studies developed a single, well defined, technically and economically feasible plan for a cap. A critical hurdle was funding sources, where dedicated federal investments were lacking.

The passage of the Bipartisan Infrastructure Law by the Biden Administration changed everything. The Reconnecting Communities Pilot program - part of the Bipartisan Infrastructure Law - is the first ever program meant to address the problems created by federal and state highway construction.

In order to obtain Reconnecting Communities Pilot funding, the City of Philadelphia's Office of Transportation, Infrastructure, and Sustainability (OTIS) and the Philadelphia Chinatown Development Corporation (PCDC) led a study to develop a single, well-defined plan that meets community needs and is feasible to construct. The study partners worked with the Pennsylvania Department of Transportation (PennDOT), additional City departments, and a large group of community stakeholders. The study partners heard from thousands of residents who overwhelming supported the following vision:

Reimagine the Vine Street corridor to improve neighborhood connections, create equitable mixed-use development opportunities, and inclusive mobility options.

Based on extensive community engagement, this report recommends the construction of a cap over the Vine Street Expressway and related improvements to the local lanes of Vine Street. The cap will cover approximately 2.5 blocks of the Vine Street Expressway between 10th and 13th Streets. This project, called the Chinatown Stitch, will sew the disconnected parts of Chinatown together and address the ongoing harms of the Vine Street Expressway. The Chinatown Stitch will accomplish these goals:

- Create an inviting public green space with trees and plants.
- Create a safe street design that extends the Chinatown neighborhood feel.
- Prioritize the needs of the elderly, young, and those with disabilities.
- Include public buildings and businesses that serve community needs.

This plan was widely supported across people of different races and ethnicities and across neighborhoods. With opportunities to provide new green space in Chinatown and connect to other green spaces in nearby neighborhoods – such as the Rail Park and Franklin Square – the plan offers a firm foundation for future discussions with the community about the design of cap amenities.

The City of Philadelphia and PCDC will advance the Chinatown Stitch in 2024. After winning the Federal Reconnecting Communities Pilot grant, the project will advance through the planning, environmental, and preliminary engineering phases. Ongoing planning work will include designing amenities, which could include basketball courts, other athletic fields, play space, or green space. The form and use of any structures will also be determined, and could include shops, housing, offices, or public buildings. Traffic calming improvements to the local lanes will also be determined in 2024, which will likely be one of the three options discussed in this report. Beginning in 2024, the project will start engineering design and National Environmental Policy Act review. The City will continue to apply for federal and other funding opportunities for design and construction of the Chinatown Stitch.

The committed advocacy of the Chinatown community to address the Vine Street Expressway represents the critical starting point for forming this concept study and getting to a single, feasible plan. The ongoing support and advocacy of the Chinatown community and surrounding neighborhoods will be critical to seeing this plan advance through design and construction to the point where it is a valued community asset. Please stay involved.

Figure 9: Design Concept 1: Two-Block

- **A** Active spaces along north-south cross streets
- **B** Potential Rail Park connection to green space on cap
- **C** Remove sound barrier wall for wider sidewalk
- **D** Improve key intersection
- **E** Explore pedestrian connection

执行摘要

华埠社区和周边社区长期受到万安街高速公路Vine Street Expressway）的不良影响。万安街（Vine Street）在1950年代首次拓宽时，以及在1980年代末和1990年代初修建万安街快速道路时，该街区的很大一部分建筑被拆除，居民和商户被迫迁离。上述市政规划工程对该街区居民的伤害不仅于此。每天超过100,000辆汽车行驶过万安街高速公路，穿过费城最具活力的综合性社区之一，给当地居民和游客的日常生活带来长期影响。这些危害包括交通事故、行人安全问题、交通拥堵以及空气污染和噪音污染。显而易见，该街区需要一项能解决上述不良影响的基础设施改造工程。

该社区花了数十年的时间寻找解决方案以治理万安街高速公路带来的危害。自2005年以来，多项研究提出对万安街高速公路实施“封顶”工程，以作为有效治理历史影响的一项解决方案。所谓封顶是指在高速公路上方搭建一个宽阔的平台或桥体。此空间可以用于建设绿色空间和其他设施，并能减少万安街快速道路的不良影响。封顶工程将与万安街当地车道相结合，以疏通、减缓车流，并实现长期的社区目标。然而，这些研究都没有制定出一项明确的、技术上和经济上可行的封顶计划。这其中的一个关键障碍是资金来源，即缺乏专门的联邦拨款。

拜登政府通过的《两党基础设施法》（Bipartisan Infrastructure Law）改变了一切。作为《两党基础设施法》的一部分，“重新连通社区试点”（Reconnecting Communities Pilot）是第一个旨在解决联邦和州高速公路建设所造成问题的计划。

I为了获得“重新连通社区试点”拨款，费城交通基础设施与可持续发展办公室（OTIS）和费城华埠发展会（PCDC）牵头进行了一项研究，旨在制定一项明确、可行的基础设施改造计划，以满足社区需求。研究合作伙伴与宾夕法尼亚州交通部（PennDOT）、其他市政部门以及一大批社区利益相关者合作。研究合作伙伴听取了数千名当地居民的意见，他们绝大多数支持以下想法：

重新构想万安街走廊，加强社区联系、创造公平的发展机会、增加包容性的交通出行方式。

基于广泛的社区参与，本报告建议对万安街高速公路进行封顶改造并对万安街的当地车道进行相关改进。该封顶计划将在第10街与第13街之间的万安街高速公路上进行大约2.5个街区的封顶。该项目名为“缝合华埠”（Chinatown Stitch），它将把华埠互不相连的部分连接在一起，并治理万安街高速公路带来的持续危害。“缝合华埠”改造计划将实现以下目标：

- 通过植树、绿化创建一个迷人的公共绿地。
- 创建安全的街道设计，延伸华埠社区的氛围。
- 优先考虑老年人、青少年和残疾人的需求。
- 包括可满足社区需求的公共建筑和商户。

该计划获得了不同族裔、民族和社区的广泛支持。该计划将为华埠提供新的绿地，并可能连接到附近社区的其他绿地，例如：铁路公园（Rail Park）和富兰克林广场（Franklin Square），这为日后与社区讨论该封顶改造项目奠定了坚实的基础。

费城市政府和费城华埠发展会将在2024年推进“缝合华埠”项目。该项目在获得“联邦重新连接社区试点”拨款后，将推进相关规划、环境和初步工程方面的工作。正在进行的规划工作将包括设计便利设施，其中可能包括篮球场、其他运动场地、游乐空间、绿地或开放空间。项目可能涉及的建筑物的形式和用途也将被确定，包括商店、住房、办公室或公共建筑。对当地车道的车流疏通、减缓改进工程也将于2024年确定，并很有可能将会是本报告中讨论的三个选项之一。从2024年开始，该项目将开始工程设计和《国家环境政策法》审批工作。市政府将为“缝合华埠”项目的建设继续申请联邦资助和其他资助机会。

华埠社区对解决万安街高速公路问题的坚定倡导是促成这一设计方案研究并制定这一可行计划的关键起点。华埠社区和周边社区的持续支持与倡导至关重要，正是因为有了这些支持，该项目才将能取得设计和建设进展，并将成为社区资产宝贵的一部分。请继续关注并参与该项目。

Figure 9: Design Concept 1: Two-Block

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ABOUT THE STUDY

What is The Chinatown Stitch?

The Chinatown Stitch is a community visioning and engineering feasibility study. The Chinatown Stitch aims to reconnect Philadelphia's Chinatown and Chinatown North neighborhoods with a cap, or series of caps, over I-676/Vine Street Expressway (Expressway) along with local roadway improvements.

The study's objectives are to develop an infrastructure solution to meet longstanding community desires to address the historic harm caused by the Expressway. The infrastructure solution has to be both technically and economically feasible.

The City of Philadelphia's Office of Transportation, Infrastructure, and Sustainability (OTIS) and the Philadelphia Chinatown Development Corporation (PCDC) led the study. The study partners worked with Pennsylvania Department of Transportation (PennDOT), the Delaware Valley Regional Planning Commission (DVRPC), additional City departments, and a large group of community stakeholders.

A central theme throughout the study was inclusive and meaningful public engagement, with both language and cultural competency. Public engagement ensured that the proposed infrastructure solution reflected local community input.

The Study developed and evaluated a range of design concepts to reconnect Chinatown with Chinatown North. The Study also evaluated how to improve pedestrian, cyclist, and transit rider safety within the study area.

The Chinatown community expressed interest in the creation of new green space as part of any design solution.

The community highlighted several historic harms caused by the Expressway construction as critical elements to address with an infrastructure solution. These harms include heightened risk of crashes, lack of pedestrian safety, traffic congestion, and increases in air and noise pollution.

The study team folded two rounds of in-person and virtual public engagement into three study phases: Co-Learning, Developing Concepts, and Sharing the Community Vision:

Phase 1: Co-Learning

In Spring 2023, the study team sought to understand the Chinatown community's priorities and needs. The Co-Learning phase also presented opportunities to share national and local examples of highway caps and streetscapes with the community. The study team held several public engagement opportunities. These opportunities included a large vision and goals survey, pop-up events in the neighborhood, and a public community visioning workshop.

Community members supported the following vision:

> **Reimagine the Vine Street corridor to improve neighborhood connections, create equitable mixed-use development opportunities, and inclusive mobility options.**

The goals for this phase were to:

1. Develop a study vision
2. Establish study goals based on community input.
3. Identify preferred locations and types of capping.
4. Prioritize uses of the capped area.

Phase 2: Developing the Concepts

In Summer 2023, the study team developed a series of potential cap design concepts. The study team based these concepts on feedback from the community gathered in the first phase of Co-Learning.

In Fall 2023, the study team presented three potential design concepts for the cap. The study team presented these concepts through a second public survey, a series of community pop-up events, and a second community visioning workshop.

PCDC also hosted two workshops specifically for Chinese speakers to discuss the design concepts and guide participants through the survey.

The study team also wanted to identify the types of tradeoffs the community would prioritize. The community prioritized these tradeoffs based on technical constraints and challenges, such as construction cost and duration.

The study team first developed a better understanding of these tradeoffs and where the community places the most benefit. The study team then sought to identity a preferred design concept for future refinement during the engineering phase of the project.

Phase 3: Sharing the Community Vision

In the third and final phase, the study team synthesized the community feedback and technical analysis to determine the final concept from the three alternatives presented to the community in Phase 2. Participants were interested in a cap with a modern design that felt like it was part of a typical Philadelphia neighborhood, as opposed to a striking signature design that would stand out. Participants also wanted to prioritize green space and park amenities and bike and pedestrian safety improvements.

The final concept was discussed with community stakeholders and institutional representatives before being released in this report in December of 2019. In Phase 3 the alternatives for Vine Street local were refined and discussed with stakeholders.

Phase 1: Co-Learning	Spring 2023
Phase 2: Developing the Concepts	Fall 2023
Phase 3: Sharing the Community Vision	Winter 2023

Table 1: Study Timeline

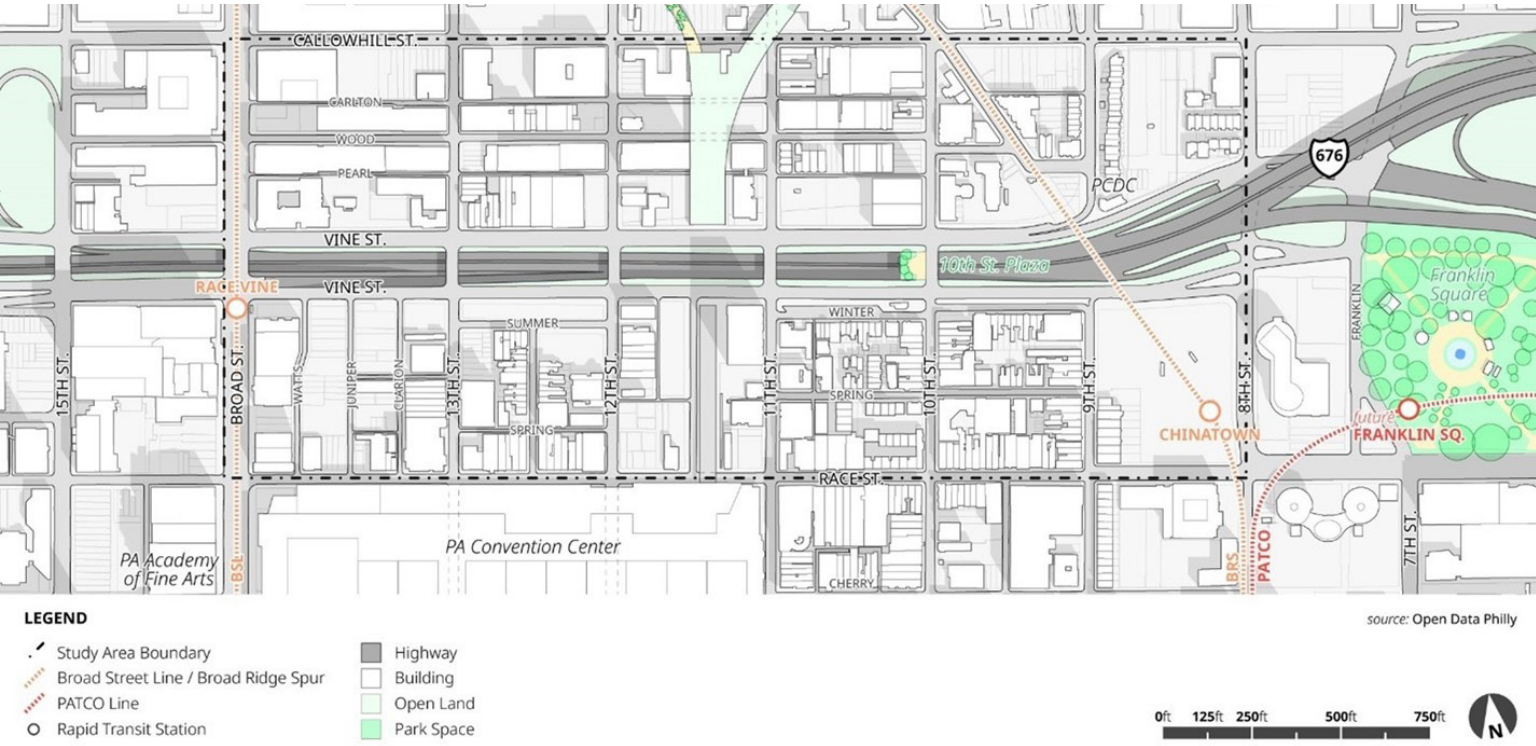


Figure 1: Study Area

Study Area

The Vine Street Expressway is a 1.75-mile depressed limited-access highway. The Expressway runs east-west through Center City Philadelphia. The Expressway sits to the north of Philadelphia's central business district. The Expressway connects I-95 to I-76 on either side of Center City. The highway was constructed in stages between the 1950s and 1990s.

The Chinatown Stitch study area lies between 8th Street and Broad Street, and from Callowhill Street to Race Street. Franklin Square, which is one of William Penn's original squares, is to the east of the study area. The Pennsylvania Convention Center is to the south. Phase One of the Rail Park is north of the study area. The Rail Park is a quarter-mile park built on a historic elevated railroad viaduct and opened to the public in 2018.

There are a variety of community and civic amenities located in the study area. These community and civic amenities include the Chinatown Community Center in the Crane building, Holy Redeemer Chinese Catholic Church and School, the Chinese Christian Church and Center, and the Asian Arts Initiative.

History & Past Planning

Chinatown

Philadelphia's Chinatown community initially formed during the mid-1800s. The PCDC gives the founding date as 1871, when the first laundry opened at 913 Race Street.

Chinese immigrants to Philadelphia established the first Chinese homes and businesses in the area. The neighborhood had pockets of poverty over the years. But Chinatown also served as a cultural sanctuary and hub for socializing, businesses, and services for the community.

Many Chinese laborers moved east after the completion of the Transcontinental Railroad in the mid-19th century. Chinatown transitioned to a bachelor society. The Page Act of 1875 prohibited Chinese women from emigrating from China to the United States.

Congress also passed the Chinese Exclusion Act of 1882, which banned Chinese immigrant laborers, and the Immigration Act of 1924, which in part restricted immigration from Asia.

From the 1880s and onwards, many Chinese and Chinese-American men could not have families in the United States. Their wives and children were refused entry into the country.

During World War II, Congress repealed exclusion acts, and later passed the Immigration Acts of 1965 and 1990. These later acts had caps that encouraged family-based, employment-based, and diversity-based immigration. Once the bans were lifted by the 1960s and onwards, Chinatown shifted to become more family-oriented, as Chinese women and children moved into the neighborhood.

During the mid-20th century, Chinatown was also impacted by urban renewal—a government-funded redevelopment initiative intended to remove "blight" and revitalize cities following World War II.

Many local residents and established communities resisted urban renewal projects, Communities advocated for local neighborhood investment, as opposed to major highway projects that would displace residents and raze communities.

In 1966, the Chinatown community formed the Committee for the Advancement and Preservation of the Chinatown Community. In 1969, the Committee became incorporated into the Philadelphia Chinatown Development Corporation (PCDC) to oppose the construction of the Vine Street Expressway.

By the 1980s, the Chinatown neighborhood was a vibrant, family-oriented community. The Holy Redeemer Church and School was Chinatown's cultural center.

The original plan for the Vine Street Expressway routed directly through the Holy Redeemer Church and School. This was the only school in the Chinatown community at the time.

The Chinatown community organized strong opposition to the proposal. The Chinatown community successfully argued for a change in the proposed alignment away from the church.

Chinatown faced negative impacts of urban renewal and the Vine Street Expressway. But Chinatown continued developing its community and economy. Chinatown grew its network of businesses. These new businesses included food manufacturing, the service industry, and light manufacturing.

Chinatown's role as a cultural hub for Asian identity and celebrations has grown regionally. There has been an increase in cultural celebrations. These cultural celebrations include the Philadelphia Chinese Lantern Festival, Chinatown Night Market, and Lunar New Year.

Chinatown has also faced a challenging economic recovery from the COVID-19 pandemic. However, the community's commitment to supporting its residents and businesses has not wavered.

Past Planning for a Cap

Philadelphia's Chinatown community has a long history of exploring improvements to connectivity, placemaking, traffic calming, and cap feasibility.

Since I-676 completed construction, PCDC has engaged in small-scale project implementations. These implementations have aimed to mitigate the impacts of the Expressway and fast-moving local Vine Street lanes. Projects have included the Vine Street Expressway Enhancement Project and the 10th Street Plaza.

In 2011, PCDC and PennDOT created the 10th Street Plaza over the Expressway on the west side of the 10th Street bridge. The plaza features an Asian-style pergola trellis, seating, two Foo dog statues, and a colorful sidewalk mural called Koi Pond. The plaza is intended to help pedestrians cross the physical and psychological barrier of the Vine Street Expressway.

Additional studies (in chronological order) include:

Table 2: Previous Chinatown Plans and Studies

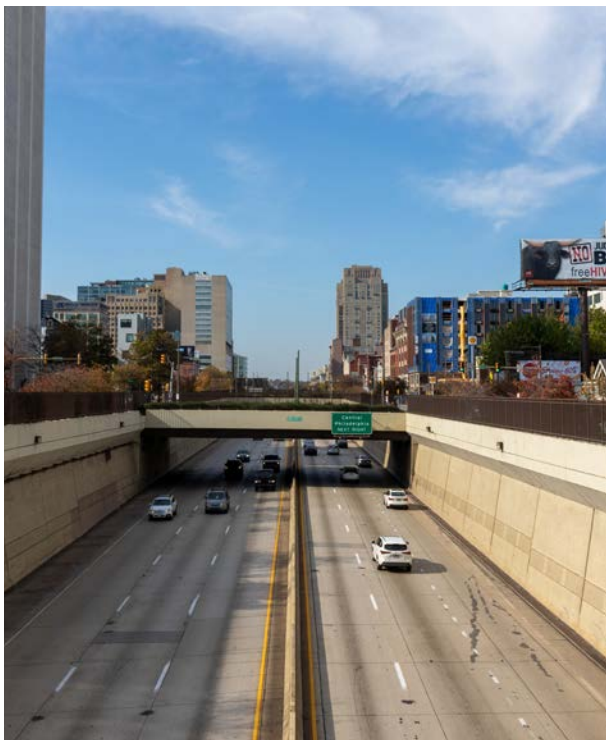
Plan	Organization	Year	Overview
Reviving Vine Street: Reconnecting Communities Short Term Action Plan for Chinatown	Project for Public Spaces	2003	Identified visible, small-scale improvements along Vine Street. These can be done in the short term to improve connections on either side of Vine Street. The projects also give a stronger identity to Chinatown along Vine Street. The Chinatown community is empowered to influence the growth of their neighborhood.
Chinatown Neighborhood Plan	Philadelphia Chinatown Development Corporation, Center City District	2004	Sought to make visible, small-scale improvements along Vine Street in the short term. Reflected Chinatown's identity, ensured connectivity to Chinatown North, and empowered the community as decision-makers in future growth. Key recommendations included covering the Vine Street Expressway and creating new open space. The plan also recommended to close Ridge Avenue near 10th and Callowhill Streets, expand Chinatown north of Vine Street, and create strong gateways.
Callowhill-Chinatown North Strategic Plan	City of Philadelphia	2013	Developed to support PHILA2035's Central District Plan. This plan is divided into five sub-areas: Poplar, Callowhill, Chinatown-North, Superblocks, and Waterfront. Only the Callowhill and Chinatown-North subareas are relevant to the Chinatown Stitch study.
Every Place Counts	U.S. Department of Transportation	2016	The U.S. Department of Transportation hosted workshops in four cities, including Philadelphia. These workshops engaged directly with neighborhoods adjacent to planned or existing transportation infrastructure projects. These workshops convened federal advisors, state agencies, local officials, community organizations, and neighborhood residents. Together, they explored design and policy approaches to create connected, economically prosperous, and environmentally and physically healthy communities. Participants and stakeholders identified safe connectivity, green open space, green infrastructure, and landscaping as main goals. They also explored various scenarios for open space and development, including capping of the Vine Street Expressway.

Table 2: Previous Chinatown Plans and Studies (Continued)

Plan	Organization	Year	Overview
Chinatown Neighborhood Plan	Philadelphia Chinatown Development Corporation	2017	Developed a vision for the neighborhood. The plan includes suggestions to improve conditions for safe walking and biking, and opportunities for more public space/open space.
Reviving Vine	Delaware Valley Regional Planning Commission	2018	Assessed what could be done to improve local Vine Street lanes for biking and walking. Developed suggestions for redesigning local lanes configurations, landscaping improvements, multimodal enhancements, and congestion mitigation strategies.
Vine Street Expressway Cover Assessment Report	Center City District	2022	A technical assessment of the feasibility of capping the entire Vine Street Expressway (including west of Broad Street). The study identified segments with no constraints to capping, segments with some constraints to capping, and segments that cannot be capped.

Highway Safety Improvement Project, Pennsylvania Department of Transportation

Concurrent to this Vision Report, the Pennsylvania Department of Transportation (PennDOT) District 6 is pursuing a Highway Safety Improvement Project (HSIP) for the local Vine Street lanes. The HSIP project is carrying forward the recommendations from DVRPC's *Reviving Vine* to improve pedestrian and bicycle safety. The Chinatown Stitch project is actively coordinating with PennDOT's HSIP study team to ensure a seamless delivery of improvements to the local Vine Street lanes.



Review of Peer Cities

The City of Philadelphia prepared a Peer *Cities Highway Capping Memo*. The memo explores how cities across the United States partner with government agencies, community groups, and private institutions to reconnect communities divided by highway construction. Peer cities include:

- Austin, Texas
- Atlanta, Georgia
- Boston, Massachusetts
- Columbus, Ohio
- Pittsburgh, Pennsylvania

The memo details the purpose for the study, costs, engagement process, and use limitations. The study team learned from peer cities to anticipate risks and strategize. The study team aims for successful design, construction, and maintenance of the Chinatown Stitch and future capping projects in Philadelphia. This memo can be found in Appendix A.

The study team also reviewed the covered lengths of existing projects throughout the country. The study team wanted to learn more about mitigations used and what designs have previously been approved.

For comparison, previous PennDOT capping projects were less than 650 feet long (I-676 overhead bridge replacements with partial caps at Family Court and Free Library = 120 feet and 643 feet, respectively; I-579 SEA Urban Open Space cap in Pittsburgh = 545 feet; I-95 cap at Penn's Landing cap = 614 feet).

Capping project length limitations are partly due to the requirement that long tunnels require jet fans for ventilation.

When highway caps create tunnels that are over 800 feet long, there is often significant and costly infrastructure. Long tunnels require escape/egress tunnels, cross passageways inside tunnels, and a tunnel administration building. The building houses the control and data acquisition systems for tunnel operations.

The study team researched the New York State Department of Transportation Route 33 Kensington Expressway cap project in Buffalo, New York. The study team learned that insufficient land area above ground necessitated the control and monitoring centers to be placed underground.

For example, the study team examined the Colorado Department of Transportation I-70 Elyria Swansea cover structure and park in Denver, Colorado. This tunnel has 5'-6" diameter jet fans that are part of the ventilation system for the 1,000-foot-long roadway tunnel.

Jet fans would reduce vertical clearance on the existing I-676 Expressway. Jet fans would require the cap to be raised or the Expressway lowered.

HOW DID WE ENGAGE WITH THE COMMUNITY?

The study team used effective, inclusive, and meaningful public engagement tools and strategies. All audiences had an opportunity to be involved in the decision-making process.

Engagement audiences included:

- Study Partners (PennDOT and PCDC).
- Study Stakeholders (DVRPC, SEPTA, and New Jersey Transit)
- Elected Officials.
- Steering Committee.
- Technical Committee.
- Community Collaboration Committee.
- Chinatown Residents, Business Owners, and Community.
- The Greater Philadelphia Community.

The City partnered with PCDC on engagement to ensure that opportunities for participation were distributed in a manner that responded to historic and ongoing disadvantages faced by marginalized groups. The City and PCDC incorporated non-technical language into all communications, and provided interpretation and translation services.

The City and PCDC provided written materials in Simplified Chinese and English, and Cantonese and Mandarin interpreters were provided at in-person events. The City and PCDC designed engagement methods with cultural considerations.

Public engagement tools and strategies included:

- Study Website.
- Social Media Campaigns.
- Two Surveys: available online and in-person, and distributed at community institutions such as churches, community centers and service providers.
- Two Community Visioning Workshops located in Chinatown.
- Pop-up Events.
- Meetings-by-request.
- Door-to-door and Business owner canvassing.
- Press Releases and Media Alerts.
- Email Notices.
- Postcard Mailings.

PCDC is an important Chinatown Stitch Study partner. PCDC has been serving and advocating for Chinese Americans in Philadelphia since 1966.

Partners and Stakeholders

Philadelphia Chinatown Development Corporation

Chinatown is the cultural and spiritual center for the Delaware Valley's Chinese and Asian-American community. Chinatown is also a vital hub of services for immigrants. PCDC is an important Chinatown Stitch Study partner. PCDC has been serving and advocating for Chinese Americans in Philadelphia since 1966.

PCDC helped to address historic barriers faced by the Chinatown community. PCDC identified appropriate public engagement tools. PCDC also provided a variety of engagement opportunities that reached residents, business owners, and workers. Furthermore, PCDC assisted with specific outreach to children, seniors, and limited English and non-English speakers.

Stakeholders

The study team formed four committees. These committees ensured that Chinatown Stitch would meet the community needs and would be economically and structurally feasible.

The committees helped to promote awareness about the study. The committees also offered support and guidance on recommendations developed by the study team. A complete list of each committees' members can be found in Appendix B.

Steering Committee

The Steering Committee included agency leaders and public officials. They participated in the coordination and allocation of study resources. Over the course of two meetings, the Steering Committee achieved the following:

1. Promoted the vision and leadership of the study.
2. Ensured study goals were met.
3. Made decisions that could not be resolved at the working level.
4. Participated in coordination and allocation of study resources.
5. Worked to reduce barriers and mitigate risks.

Members: City of Philadelphia, OTIS; City of Philadelphia, Department of Streets; City of Philadelphia, Department of Planning and Development; Delaware Valley Regional Planning Commission (DVRPC); PennDOT District 6; PCDC.

Technical Committee

The Technical Committee was comprised of government agencies and technical professionals who identified risks and structural feasibility issues. The Technical Committee held four meetings, and accomplished the following:

1. Promoted the vision and leadership for the study to their organizations.
2. Provided input to the study and identified risks/structural feasibility issues.
3. Participated in meetings to ensure inclusion of the organizations' needs.
4. Provided high-level issue/conflict resolution as needed.
5. Provided feedback on alternatives and design issues.
6. Reviewed technical analysis, including traffic modeling.
7. Acted as a sounding board on the economic analysis and equity vision.
8. Communicated up to their leadership on the Steering Committee any important decisions, study status, and milestones.

Members: City of Philadelphia, OTIS; City of Philadelphia, Department of Streets; Delaware Valley Regional Planning Commission (DVRPC); Mayor's Office for People with Disabilities; PCDC; Philadelphia City Planning Commission (PCPC); Philadelphia Water Department (PWD); PennDOT District 6.

Community Collaboration Committee

The Community Collaboration Committee consisted of individuals representing the Chinatown community, Callowhill neighborhood, and surrounding stakeholders.

They served as a sounding board and community experts to assist in sharing how to best contact, communicate, and engage with their communities.

The Community Collaboration Committee advised on engagement and outreach to ensure diversity, inclusion, and equity. Members helped to balance public input and provided advice and expertise in making decisions. The Committee also developed a feasible Community Vision that met the community's priorities.

The Community Collaboration Committee held four meetings, and accomplished the following:

1. Promoted study awareness and support.
2. Advised on engagement and outreach to ensure diversity, inclusion, and equity.
3. Identified successful engagement strategies and where gaps may exist.
4. Provided higher level public input – gathering feedback from each organization.
5. Facilitated high level issue/conflict resolution as needed during alternatives identification.
6. Provided input to the study team for issues and recommendations for the Steering Committee briefings.
7. Provided advice and expertise to help develop a feasible preferred alternative that met community priorities.

PCDC Chinatown Advisory Group

The PCDC Chinatown Advisory Group ensured that the voices of Chinatown stakeholders were central to the study. The stakeholders included residents, businesses, institutions and their members, workers, property owners, parishioners.

The Committee provided a safe space for Chinatown stakeholders to have conversations about expectations, priorities, and strategies. Chinatown Advisory Group also helped to ensure that Chinatown's broad interests are represented.

The Chinatown Advisory Group held six meetings, and accomplished the following:

1. Provided input into the guiding values and principles.
2. Supported outreach and engagement for the study.
3. Advocated for the guiding values and Chinatown's priorities in the public engagement and design processes.
4. Coordinated strategies and built consensus.

PHASE 1: CO-LEARNING

Community Engagement

Phase 1: Co-Learning promoted a collaborative listening and learning environment. The study team and the community shared individual experiences and expertise.

The study team initiated the study by examining and understanding past planning work. The community led or collaborated on much of the past planning work.

The study team learned from the community. The study team also shared expertise about how other cities have approached the issue of legacy highways that have cut through dense communities, often communities of color.

The study team also educated the community about the tools used in Philadelphia and elsewhere to address the types of traffic safety challenges they experience on Vine Street.

The City set a goal to engage at least 500 community members in the first engagement phase. The study team surpassed this goal, receiving 2,335 multi-lingual responses via paper and electronic surveys, and approximately 57 people attended an in-person event (see Table 4).

Community Vision Workshop #1

On April 26, 2023, the study team held the first of two in-person Community Visioning Workshops at the Chinese Christian Church & Center (1101 Vine Street) from 6:00 p.m. to 8:00 p.m.

This workshop was an open house. Community members could stop by any time during the event to view display boards and talk one-on-one with study team members.

The Community Vision Workshop #1 has several goals. The workshop informed the community about the Chinatown Stitch study, provided a history of the Vine Street Expressway, described previous planning efforts to address its impacts, and presented information about other highway cap projects from around the country.

Attendees provided feedback on the community vision and goals for the Chinatown Stitch cap. Participants also provided feedback on safety issues they face in the study area, their preferred cap amenities, and potential trade-offs.

Fifty-seven (57) people signed into the Community Vision Workshop. Of those attendees, forty-four (44) people completed an exit survey. Almost half the participants who completed the exit survey identified themselves as Asian. The remaining half identified themselves as White (non-Hispanic).

The study team promoted the workshop through the following methods:

- Simplified Chinese and English flyers placed in Chinatown businesses.
- Postcard mailing to 1,115 residences within the study area.
- City of Philadelphia, PCDC, DVRPC, and partner social media posts.
- Project website.
- Press release and local media coverage.

The study team displayed eight plan display boards translated into Simplified Chinese and English. Three displays were educational in nature, and five were interactive. Study team members were stationed at each plans display to discuss the display topics and answer questions. PCDC provided two Mandarin and two Cantonese interpreters.

Overall, participants expressed interest in a cap with a modern, neighborhood feel that prioritizes green space/park amenities and bike and pedestrian safety improvements. If buildings are included, participants suggested they should be smaller-scale in size and include public facilities.

Please see Appendix C for the Community Vision Workshop #1 Board Displays and Summary.

Survey #1: Spring 2023

Between March 2023 and May 2023, the City and PCDC released a survey to gather input on the community's vision and goals for the proposed cap. The survey was released electronically in three languages: English, Simplified Chinese, and Spanish. The electronic survey had 15 questions.

PCDC supplemented the electronic survey with a shorter eight-question paper survey that was distributed at three pop-up events in Chinatown and at apartment buildings in Chinatown (e.g.: On Lok House for seniors).

Table 3: Race/Ethnicity of Community Vision #1 Workshop Attendees Who Completed the Exit Survey

Race/Ethnicity	Total	Percent
American Indian/Alaska Native	0	0%
Asian	21	48%
Black/African American	1	2%
Hispanic/Latinx	1	2%
Middle Eastern	0	0%
Native Hawaiian or Other Pacific Islander	0	0%
White (non-Hispanic)	21	48%
Other (please specify)	0	0%
Prefer not to say	0	0%

Table 4: Surveys by Language

	English	Simplified Chinese	Spanish	Format Total
Electronic	1,538	101	1	1,640
Paper	114	581	0	695
Language Total	1,652	682	1	2,335

The study team promoted the survey via:

- Simplified Chinese and English flyers placed in Chinatown businesses.
- Postcard mailing to 1,115 residences within the study area.
- City of Philadelphia, PCDC, DVRPC, and partner social media posts.
- Study website.
- Press release and local media coverage.
- PCDC-distributed paper surveys to community connections, Chinatown businesses, and clients.

The survey received 2,335 responses. While 29% percent of the electronic and paper surveys were completed in Simplified Chinese, 98% of the paper surveys were completed in Simplified Chinese.

The survey showed that 87% of respondents support the Vision Statement from the U.S. Department of Transportation's 2016 Every Place Counts project to:

"Reimagine the Vine Street corridor to improve neighborhood connections, create equitable mixed-use development opportunities, and inclusive mobility options."

Survey participants consistently supported this statement, regardless of the respondent's stated racial identity or home location.
The first round of engagement also asked residents which aspects of the study were most important.

This feedback is summarized in the following four goals for the Chinatown Stitch study:

- Create an inviting park space with landscapes and public plazas.
- Create a safe street design that extends the Chinatown neighborhood feel.
- Prioritize the elderly, young, and those with disabilities.
- Include public civic buildings, facilities, and businesses that serve community needs.

Survey participants consistently agreed on these goals, regardless of respondents' stated racial identity or home location.

Please see Appendix D for Survey #1 Summary.

PCDC Chinatown Engagement

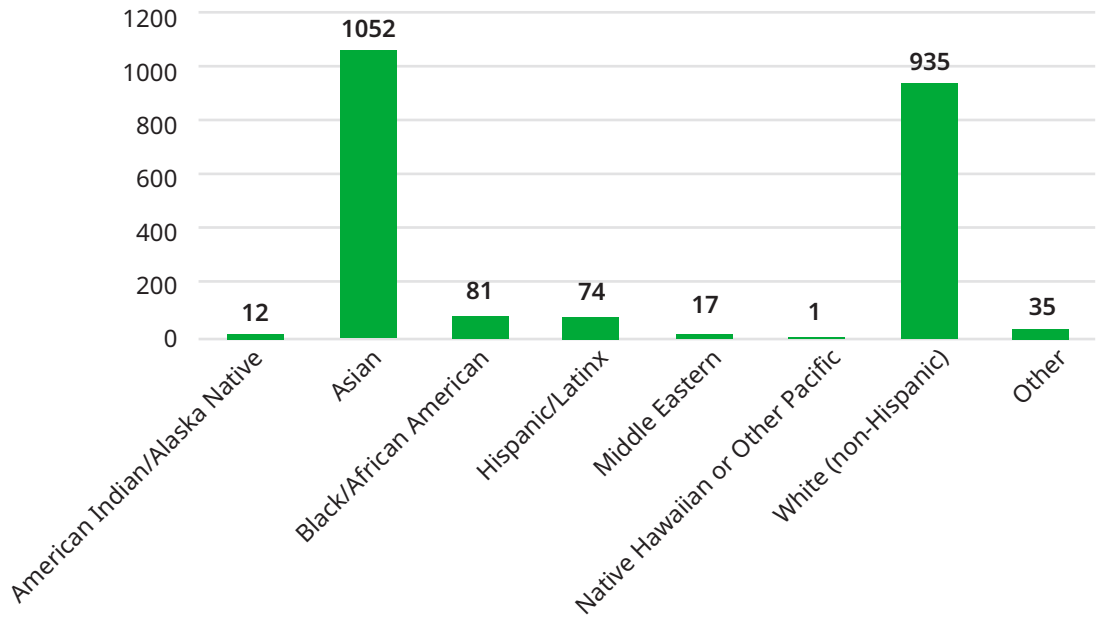
Being able to participate in engagement in one's own language is a cornerstone of equity.

The study team needed to reach Chinatown residents, business owners, and community members as well as limited English and non-English speaking populations within Chinatown. PCDC assisted with public engagement. PCDC distributed the survey, hosted pop-up events, and canvassed businesses.

PCDC engaged people where they were, using pop-up events and canvassing. These engagement methods were quick and casual ways to hear from members of the community, especially those who typically would not attend a traditional public meeting.

The public engagement process included:

- Paper surveys distributed at PCDC events.
- Hosted three pop-up events:
  - April 15, 2023: 10th Street Plaza.
  - April 21, 2023: Crane Community Center.
  - April 28, 2023: Chinatown Fire Station.
- Hosted two sessions at On Lok House.
- Canvassed Chinatown businesses.
- Conducted surveys with PCDC Housing Counseling clients.
- Distributed surveys to Chinatown community leaders (e.g., church leaders, Chinese American Women's Sisterhood Society, well-connected residents).
- Organized a children's coloring activity.



Graphic 1: Race/Ethnicity of Survey #1 Participants (paper and electronic surveys)

Equity Vision

Casting an equity vision is an important step to make sure that any future infrastructure project. An equity vision can benefit the community and avoid any negative or unintended consequences.

While the Chinatown Stitch is intended to serve as a benefit to the Chinatown community, research shows that urban greening and parks can contribute to the gentrification and displacement of surrounding low-income neighborhoods of color. Today, Chinatown is a mixed-income, minority neighborhood with 57% of immigrants earning less than 30% of the area's median income.

The study team proposes the following Equity Vision for the Chinatown Stitch:

> **The Chinatown Stitch will reconnect Chinatown, reduce the negative impacts of the Vine Street Expressway and local lanes, and provide greenspace. The Chinatown Stitch will be implemented with complimentary policies and projects to ensure that the project enhances the cultural character of Chinatown as a work live immigrant community, deepened its social cohesion through programming, reserves city owned land to increase affordable housing, does not directly or indirectly displace residents and small businesses, weaken the cultural identity, and will be a well maintained community asset in the vision of the neighborhood plan for decades to come.**

The study team expects to develop the Equity Plan in 2024 to better understand any possible negative impacts of a highway cap and related improvements. The Equity Plan will develop the needed policies and projects to offset any possible equity risks.

PHASE 2: DEVELOPMENT OF CONCEPTS

Existing Conditions

The study team reviewed the existing conditions of the study area to gain an understanding of how the area is currently operating and performing.

The study team explored the roadway, the structures, and the safety and traffic flow of Vine Street via existing plans, field visits, structural reports, crash data, and traffic counts.

Public Street Right-of-Way

The total width of the facility, including both the Vine Street local lanes and the Expressway, varies between 190 feet and 200 feet. The City of Philadelphia provided GIS mapping for the right-of-way for the study area. The property lines shown on plans included within this report have not been verified with deed information. The property lines are considered for information only.

The right-of-way is comprised of Legal Right-of-Way for City Streets along the numbered Streets (10th, 11th, 12th, 13th), PennDOT Legal Right-of-Way for Local Vine Street and Broad Street, and Limited Access Right-of-Way for Vine Street Expressway.

The study team anticipates that all work for the planned cap project can be completed within the existing Legal Right-of-Way.

Vine Street Expressway

The Vine Street Expressway crosses central Philadelphia just north of Center City and bisects the Chinatown neighborhood. The Vine Street Expressway is comprised of six 12-foot lanes with variable width shoulders and a 6-foot median.

The Expressway carries more than 100,000 vehicles per day. Vine Street's local lanes alone carry 20,000-30,000 additional vehicles per day through the community.

Vine Street Local Lanes

Roadway Classification within the study area are as follows:

- Local Vine Street (SR 2676): Urban Minor Arterial.
- 9th Street, 10th Street, 13th Street (North of Vine Street): Urban Major Collector.
- 11th Street, 12th Street, 13th Street (South of Vine Street): Urban Major Arterial.

The current local Vine Street alignment uses separate eastbound and westbound roadways. Local Vine Street is separated by the Vine Street Expressway, which is below the grade of the local roads. The numbered north-south streets cross over the Expressway in a series of overpass bridges.

Near the eastern end of the project, the Vine Street Expressway splits 9th Street. Ninth Street runs in the northerly direction south of Vine Street. But in the block between Callowhill Street and westbound local Vine Street, it switches direction to allow vehicles from Callowhill Street to access Vine Street. Within the project study area, local Vine Street intersects with 10th Street, 11th Street, 12th Street, 13th Street, and Broad Street as signalized intersections.

Pedestrians are accommodated on both eastbound and westbound local Vine Street by sidewalks of varying widths. There are handicapped accessible curb ramps. These curb ramps are in varying states of compliance with the current Americans with Disabilities Act (ADA) standards along the corridor. The current lane configuration on local Vine Street is as follows, and can be seen in Appendix E.

Local Vine Street Westbound:

- 8th Street to 9th Street: Two 12-foot-wide travel lanes.
- 9th Street to 10th Street: Three 11-foot-wide travel lanes.
  - Additional 11-foot-wide parking lane.
- 10th Street to Broad Street: Four 11-foot-wide lanes.
  - Parking is allowed in the right-most lane during certain hours between 10th Street and Broad Street.

Local Vine Street Eastbound:

- Three – 11-foot-wide travel lanes
  - Parking for authorized vehicles only on the south side, between 9th Street and 11th Street.

Utilities

The number of intersections between the north/south numbered streets and separate eastbound and westbound directions of Vine Street led to the need for several PA One-Call web tickets being generated for the concepts.

The study team performed the PA One-Call web ticket entries in November 2022. The study team determined that there are numerous underground utilities within this area. The facilities are owned by the following companies:

- Lumen (formerly Century Link).
- Crown Castle.
- Intersection Media.
- PWD.
- SEPTA.
- Verizon.
- Vicinity.
- The City of Philadelphia Streets Department also maintains signal conduits and equipment within this area.

Bridges and Retaining Walls

The study team obtained existing plans for the study area from PennDOT District 6. The existing plans included structure plans and the National Bridge Inspection Standards reports for the structures.

There are five bridges spanning over Vine Street Expressway and their associated retaining walls that line the Expressway within the study limits of 8th Street to Broad Street. The existing 10th Street, 11th Street, 12th Street, 13th Street, and Broad Street bridges were built between 1989 and 1990 along with the retaining walls.

Overhead highway signs are attached to the fascia of the bridges to guide drivers on the Vine Street Expressway. The 10th Street bridge has an extra wide 60-foot sidewalk on the west side with a small plaza. The 13th Street bridge also spans over an on-ramp adjacent to eastbound Vine Street Expressway.

Immediately east of the Broad Street bridge on the south side of the Expressway, there an overhead steel sign structure that spans over the eastbound local Vine Street and the on-ramp to eastbound Vine Street Expressway. The column of the sign structure rests on the retaining wall connecting 13th Street and Broad Street bridges.

The existing bridges are all single span bridges with reinforced concrete abutments. The bridges have a reinforced concrete deck supported on multiple welded steel I-beams made composite with the deck. Structure lengths for the bridges are 104 feet (10th Street), 97 feet (11th Street), 99 feet (12th Street), 116 feet (13th Street), and 112 feet (Broad Street). Minimum vertical clearances provided under the bridges are 14.53 feet (10th Street), 14.58 feet (11th Street), 14.70 feet (12th Street), 14.76 feet (13th Street), and 14.53 feet (Broad Street).

The retaining walls are reinforced concrete walls with the front face battered outwards from the Expressway. At the top of the retaining wall is a planter area that hangs over the Expressway. The retaining walls are mainly supported on spread footing foundations. The retaining wall on the north side of the Expressway between 10th Street and 11th Street bridges is supported on piles. Pile foundations also support a small portion of retaining wall on both sides of the Expressway between 11th Street and 12th Street bridges.

The study team did not conduct an inspection of the bridges and retaining walls. However, the study team did review PennDOT's 2022 inspection reports. In PennDOT's report, the structures are reported to be in overall good to satisfactory condition, with some minor problems noted in both the superstructure and substructure. Hairline to fine vertical and diagonal cracks in the retaining walls were noted.

Development of Cap Concepts

The goal of cap concept development was to find cap-solutions that met the Vision Statement and Project Goals as determined in Phase 1. The cap concept also had to be technically feasible and provide a range of alternatives to bring to the community for further refinement.

The study team reviewed past cap projects or studies in Pennsylvania and additional states. The study team also researched the standards for emergency and life safety systems for enclosed highways, reviewed existing plans for the construction of the Vine Street Expressway, and identified existing conditions and technical challenges.

Technical Challenges

Roadway Tunnel Considerations

A "road tunnel" is defined by the Federal Highway Administration as an enclosed roadway for motor vehicle traffic with vehicle access limited to portals, regardless of type of structure or method of construction.

The road tunnel may include lighting, ventilation, fire protection systems, drainage and pumping systems, cameras and other security equipment, fireproofing, and emergency egress capacity. The Federal Highway Administration definition does not include a minimum or maximum length.

The National Fire Protection Association definition of a tunnel is: an underground structure with a design length greater than 75 feet and a diameter greater than 6 feet.

The National Fire Protection Association 502 is the standard used for the design of emergency ventilation systems and life safety systems in road tunnels or enclosed highways. The standard describes the minimum fire protection and life safety requirements based on tunnel length.

Tunnels are separated into five categories based on length:

- Category X: Tunnels less than 300 feet.
- Category A: Tunnels between 300 feet and 800 feet.
- Category B: Tunnels between 800 feet and 1,000 feet.
- Category C: Tunnels between 1,000 feet and 3,280 feet.
- Category D: Tunnels longer than 3,280 feet.

A road tunnel, with motor vehicles, may require ventilation shafts and powered fans. These ventilation shafts and fans can remove toxic exhaust gases during routine operation, due to even low concentrations of carbon monoxide being highly toxic.

Additionally, due to the enclosed space of a tunnel, fires can have very serious effects on users with the main danger being smoke production. The National Fire Protection Association 502 Chapter 7, Table 7.2 lists mandatory requirements, conditionally mandatory requirements , and nonmandatory requirements, for tunnel fire protection and fire life safety.

Should two capping structures be constructed near each other with an open-air distance designed in between structures, passengers

and other users in the enclosed highway may be provided with an indefinite point of safety from smoke and other hazards. This distance would require significant analysis for confirmation that smoke and other hazards are not transferred from one tunnel to the other.

Table 5 (below) is adapted from Table 2.3 of The National Cooperative Highway Research Program 20-07(363) FR, 05/2016. This is a simplified look at fire safety risk and the fire life safety systems needs for various tunnel lengths and types of vehicles allowed in the tunnel.

The colors represent the level of risk and relative cost of fire life safety systems (green = least risky/cost; red = most risky/cost).

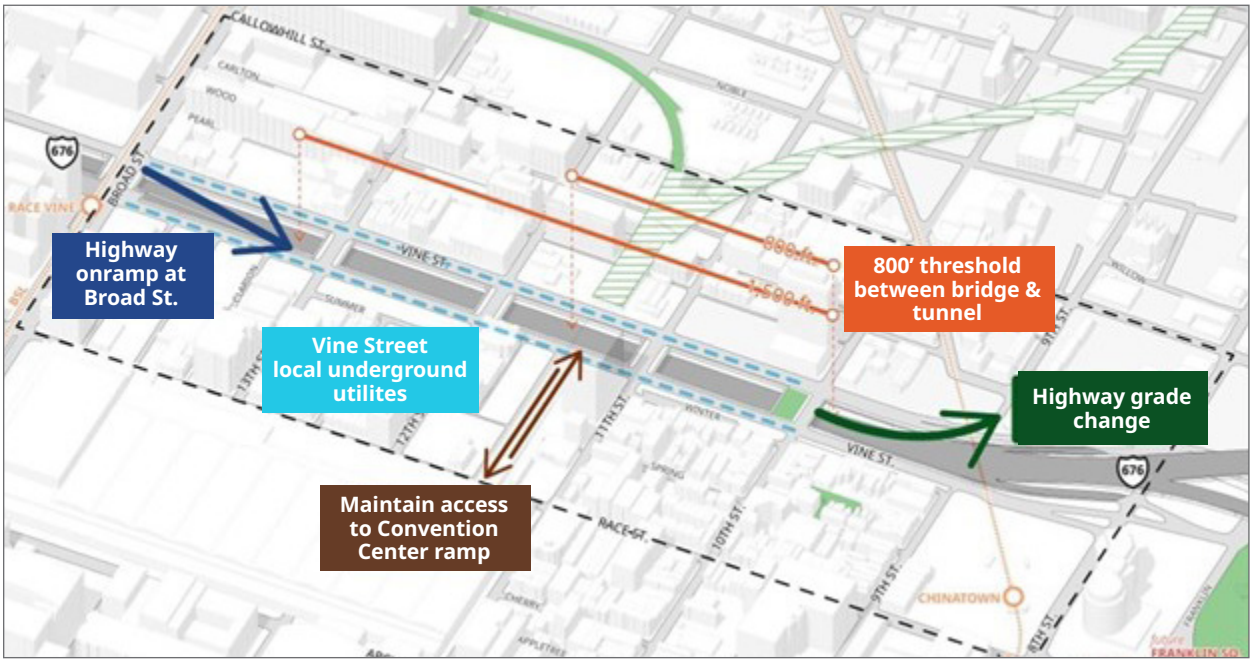
If the highway cap over Vine Street Expressway were to create a tunnel longer than 800 feet, the following systems would be needed:

- Ventilation system (jet fans).
- Lighting.
- Automatic fire detection system.
- Fire alarm system.
- Emergency communications system.
- Emergency lighting.
- Emergency power.
- Passive fire protection system (fire resistive construction materials) to help protect critical structural elements from damage due to high temperatures.
- Active fire protection system (water based fixed firefighting systems or FFFS) such as deluge sprinklers and water mist to control the fire, limit fire growth and heat release rate, prevent fire propagation and provide thermal management.
- FFFS water storage tank and pump station.
- Escape tunnel / emergency exits.
- Tunnel closure and traffic control.
- Hydrocarbon detector.
- Tunnel drainage system.

Table 5: Simplified Tunnel Fire Safety Risk and Fire Life Safety Systems Needed Based on the Tunnel Length and Traffic Conditions. Excerpt from NCHRP20-07(363) FR, 05/2016

Category	Tunnel Length (ft)	Bi-directional traffic with Heavy Goods Vehicles (HGV) and Flammable Liquid Cargo (FLC)
X	< 300	No Ventilation; No Fire Suppression.
A	300 - 800	Ventilation; (suppression likely to protect structure).
B	800 - 1000	Ventilation, Fire Suppression
C	1000 - 3280	Ventilation, Fire Suppression
D	> 3280	Ventilation, Fire Suppression

Figure 2: Constraints on the Potential Cap Length and Location



Potential Cap Lengths and Locations

The study team reviewed the existing plans and top side observation of existing field conditions.

The study team made the following conclusions:

- A cap structure is not feasible between 8th Street and 10th Street due to the existing grades and elevations. The Expressway profile climbs quickly at approximately 5% slope east of 10th Street and the cap cannot achieve at least a minimum vertical clearance of 14.5 feet over the Expressway (see Vertical Clearance Considerations). The cap would have to be raised or the Expressway lowered, with both actions creating significant problems and costs. A higher cap creates a visual and physical barrier. Lowering the Expressway requires extensive reconstruction and creates an impact to the SEPTA Broad Ridge Spur subway tunnel at 9th Street.
- A cap is also not feasible between 13th Street and Broad Street. There is an on-ramp to eastbound Vine Street Expressway which starts its descent at Broad Street and continues until it merges with the Vine Street Expressway under 13th Street. The cap over the ramp cannot achieve at least a minimum vertical clearance of 14.5 feet. Creating a cap over the Expressway without covering the ramp would require support piers along the edge of the roadway between the through lane and ramp lane, thereby compromising the vehicular sight distance for both through and ramp users. Creating a cap over just westbound Vine Street Expressway would require support piers and foundations to be constructed in the median of the Expressway, which is a costly alternative and significantly disruptive to traffic. Additionally, constructing a cap in this area creates an impact to the nearby SEPTA Broad Street subway tunnel.

- The existing opening between the 10th Street and 11th Street bridges is 328.5 feet long. If the Expressway were to be covered from 10th Street to 11th Street, it would create a 533.5 feet long tunnel. See Figure 3.
- The existing opening between the 11th Street and 12th Street bridges is 360.5 feet long. If the Expressway were to be covered from 11th Street to 12th Street, it would create a 515.5 feet long tunnel. See Figure 4.
- The existing opening between the 12th Street and 13th Street bridges is 378.5 feet long. If the Expressway were to be covered from 12th Street to 13th Street, it would create a 533.5 feet long tunnel. See Figure 5.
- If the Expressway were to be covered contiguously over two city blocks between 10th Street and 13th Street (10th Street to 12th Street or 11th Street to 13th Street), it would create a tunnel that is 971.5 feet long See Figures 6 and 7.
- If the Expressway were to be covered contiguously over three city blocks between 10th Street and 13th Street, it would create a tunnel that is 1,427.5 feet long. See Figure 8.
- If the Expressway were to be covered for a distance of over 800 feet, it would require both ventilation and fire suppression systems making it the costliest design concept.

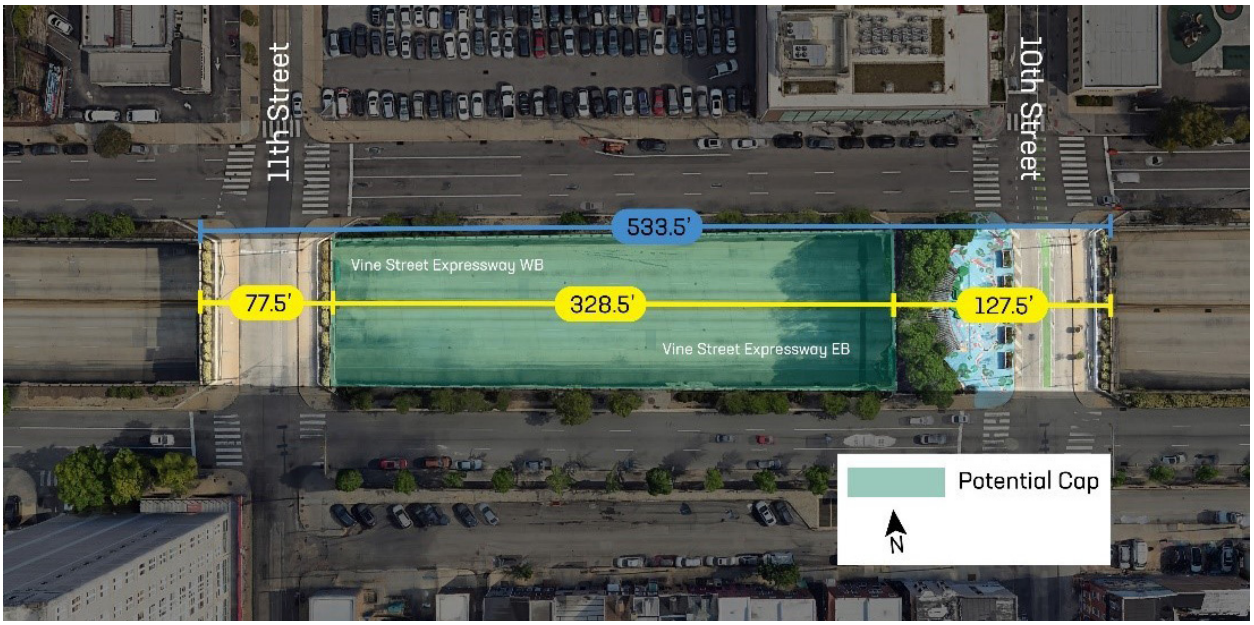


Figure 3: Measurements from 10th Street Bridge to 11th Street Bridge

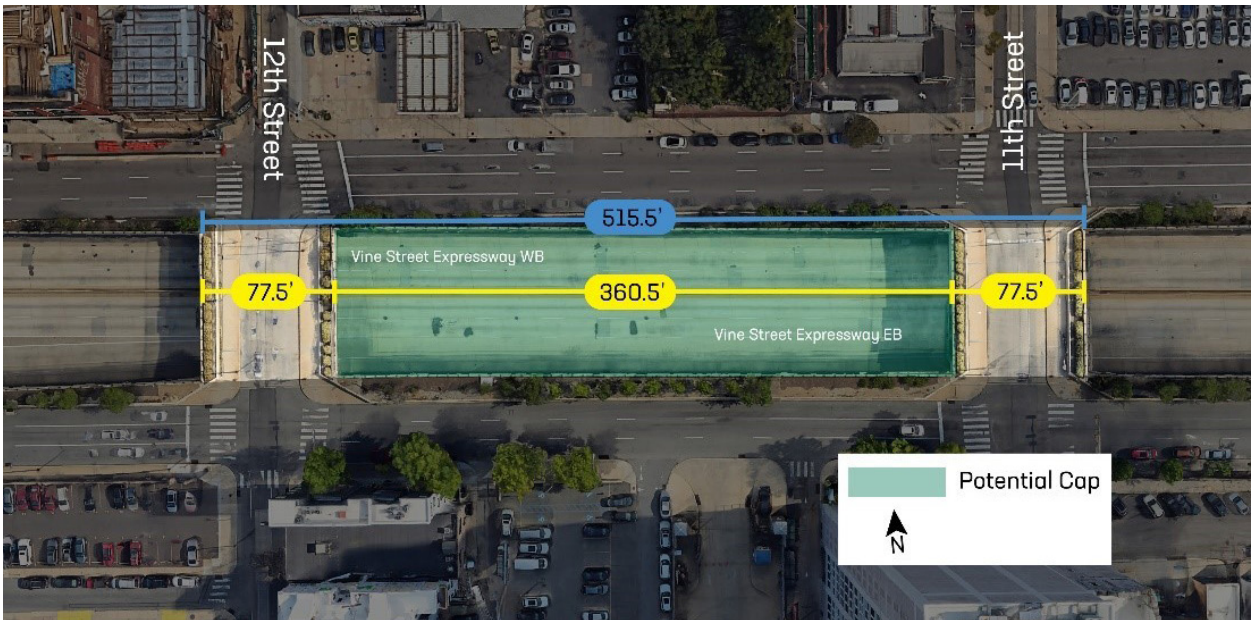


Figure 4: Measurements from 11th Street Bridge to 12th Street Bridge

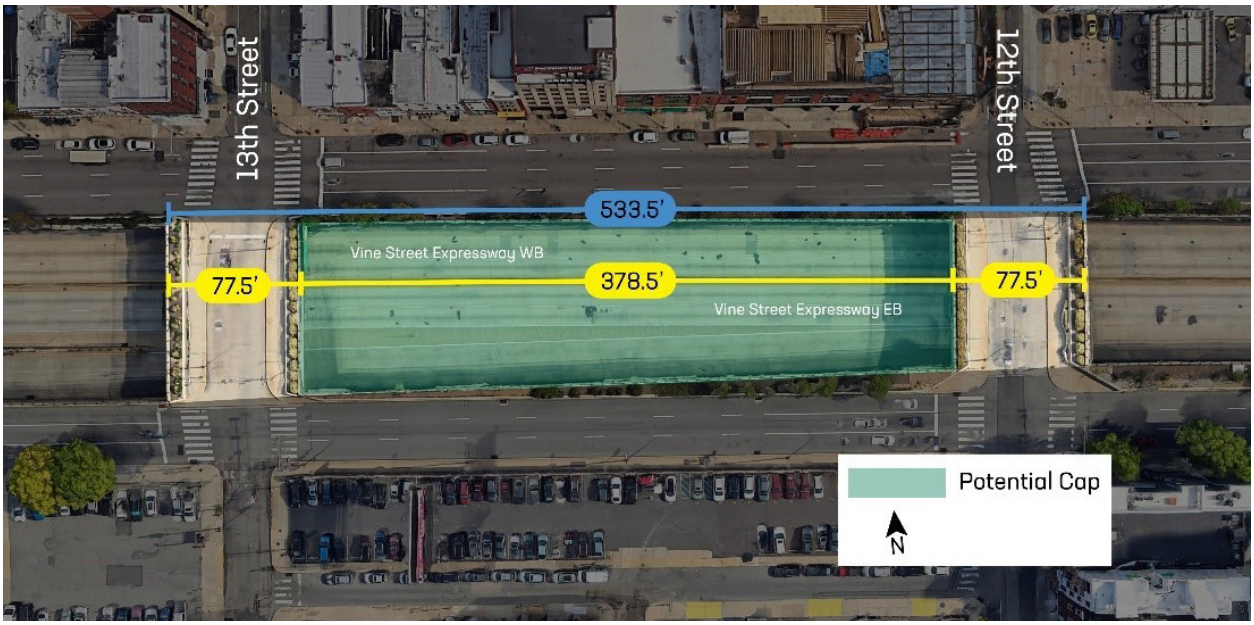


Figure 5: Measurements from 12th Street Bridge to 13th Street Bridge

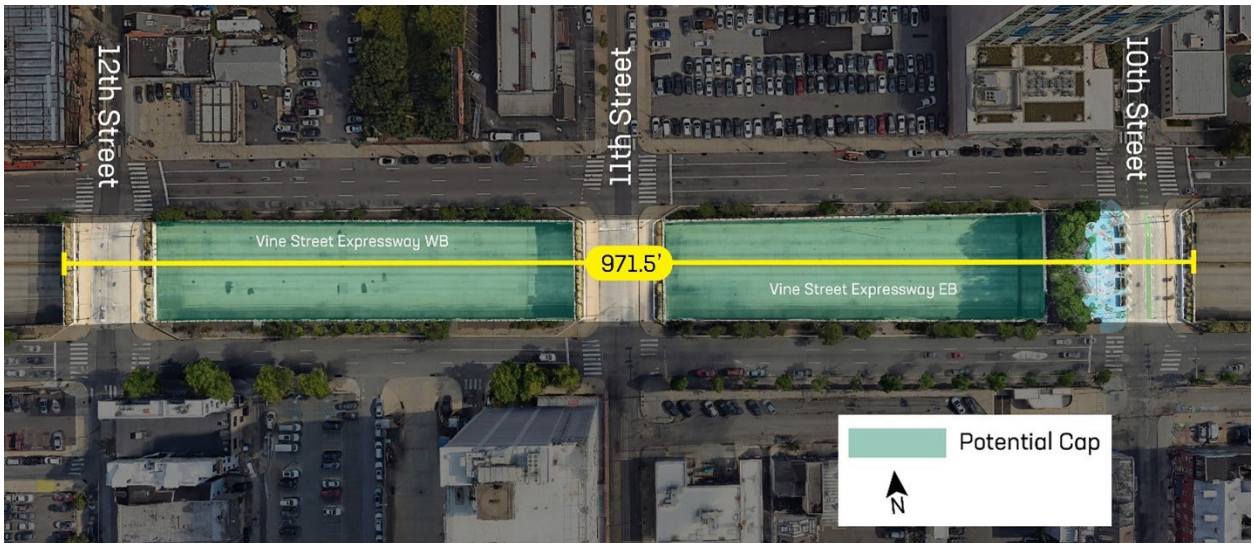


Figure 6: Measurements from 10th Street Bridge to 12th Street Bridge

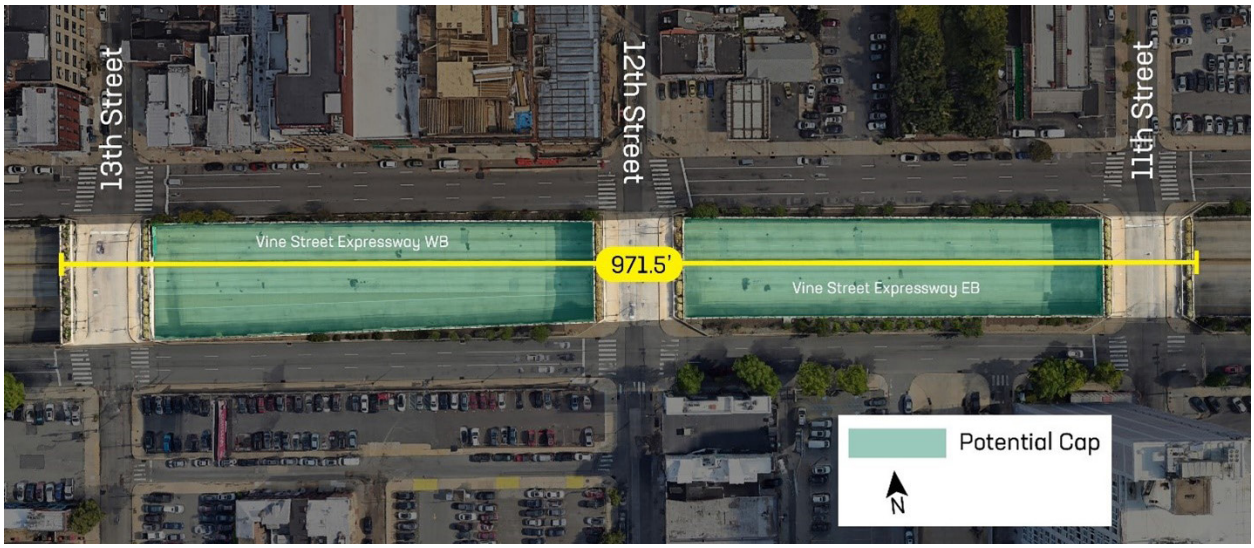


Figure 7: Measurements from 11th Street Bridge to 13th Street Bridge

Figure 8: Measurements from 10th Street Bridge to 13th Street Bridge

Vertical Clearance Considerations

The existing bridges in the study area were designed to provide a minimum vertical clearance of 14.5 feet over the Vine Street Expressway.

The I-676 overhead bridge replacement project (18th-22nd Streets) completed in 2019, was also designed to provide a minimum vertical clearance of 14.5 feet over the Expressway.

The Chinatown Stitch project would be required to provide a vertical clearance of at least 14.5 feet over the Expressway. The superstructure that would support the highway cap must also be designed to provide this minimum vertical clearance.

The bridges in the study area have actual vertical clearances ranging from 14.53 feet to 14.76 feet. With these limiting values, the study team would not expect the loads from the cap and its amenities to be much greater than the loading used to design the bridges.
The depth of the cap structure would not be greater than the depth of the existing bridge structure.

If the cap design load were to be excessive, then the cap would have to be raised or the expressway lowered to meet the minimum vertical clearance requirement. The study team would prefer not to raise or lower the cap due to a significant increase in cost.

Highway guide signs are attached to the fascia of the existing bridges in the study area. These signs benefit the drivers on the Expressway.

Capping the Expressway from bridge-to-bridge would result in the need for several of these signs to be removed or relocated. The study team would have to find alternative places for the guide signs, due to the limited vertical clearance inside the enclosed Expressway. The signs would need to be addressed in the next phase of the Chinatown Stitch project when the exact cap locations and limits would be defined.

If the enclosed Expressway were to exceed 800 feet long, a ventilation system would be needed. Jet fans, which would be part of the ventilation system, would reduce the already minimal vertical clearance on the Expressway.

The cap superstructure depth would likely be similar to that of the overpass bridges. As a result, the cap would likely extend another 10 feet east of the 10th Street bridge, and 10 feet west of the 13th Street bridge, without compromising required vertical clearance.

Cap Concept Designs

The study team developed six concept designs, and then advanced forward with three concepts. The study team determined that not all of the six concepts would achieve the goals of the study adequately.

The study team developed a set of six key factors to evaluate each of the three concepts:

Positive Factors:

- Amount of green space.
- Potential buildings along or on the cap.
- Safer streets for people walking and biking.
- Ease of connection to the Rail Park.

Negative Factors:

- Construction duration and impact on the surrounding community.
- Construction cost.

Figure 9: Design Concept 1: Two-Block

- **A** Active spaces along north-south cross streets
- **B** Potential Rail Park connection to green space on cap
- **C** Remove sound barrier wall for wider sidewalk
- **D** Improve key intersection
- **E** Explore pedestrian connection

Concept 1: Two-Block

This design concept is titled the Two-Block, though it would likely cover 2.5 blocks and create the feel of a larger cap. This concept would add caps for the full block between 10th and a point midway between 11th Street and 12th Streets, and a separate cap between 12th and 13th Streets.

There would be an opening in the highway cap between 11th and 12th Streets, which would allow for ventilation of the expressway. The opening would be framed by greenery along the north and south sides to thematically connect the caps into a single concept.

All north-south streets would be flanked by park space or public buildings. A connection to the Rail Park would be possible from the east cap. Additionally, this option could be easily phased and constructed in single block phases. The estimated construction duration would be 4-5 years.

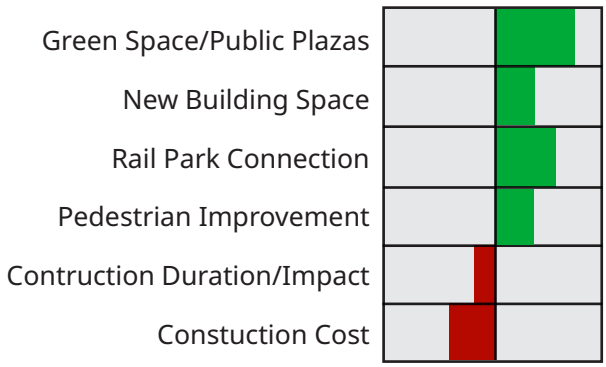


Table 5: Cap Design Concept 1 Key Factors

Figure 10: Design Concept 2: Three Block Cap - Full Coverage

- **A** Active spaces along north-south cross streets
- **B** Potential Rail Park connection to green space on cap
- **C** Remove sound barrier wall for wider sidewalk
- **D** Improve key intersection
- **E** Explore pedestrian connection

Concept 2: Three-Block Cap - Full Coverage

This concept would add a full continuous cap from 10th to 13th Streets, between the surface lanes of Vine Street. There would be no exposed highway traffic between 10th Street and 13th Street.

This cap would be longer than 800 feet. Caps that are longer than 800 feet require additional ventilation, fire safety, modifications to the structure to accommodate vertical clearance requirements, potential right-of-way acquisition for life safety apparatus, lighting for I-676, and ADA compliant evacuation infrastructure for the Vine Street Expressway.

Compared to the two-block concept, this concept would require significantly more cost, time, and traffic disruption during construction. The estimated construction duration would be 5-7 years.

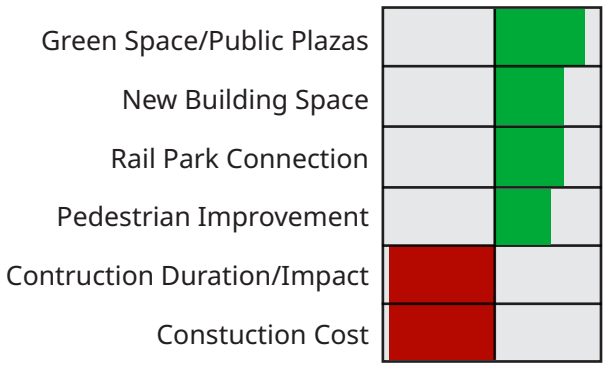


Table 6: Cap Design Concept 2 Key Factors

Figure 11: Design Concept 3: Three Block Cap - Vine Street Westbound to the Middle

- **A** Re-locate westbound Vine Street over cap
- **B** Shorter crossing distance
- **C** Active spaces along north-south cross streets
- **D** Potential Rail Park connection to on cap
- **E** Convention Center ramp access
- **F** Remove sound barrier wall for wider sidewalk
- **G** Improve key intersection
- **H** Explore pedestrian connection

Concept 3: Three-Block Cap - Vine Street Westbound to Middle

This concept is similar to Concept 2: Three-Block – Full Coverage concept. The major change is that westbound Vine Street would be shifted south to run next to eastbound Vine Street at 11th and 12th Streets.

This concept would be the most expensive and difficult to build. But the Three Block Cap would also create the most space for inclusive development. This concept would also eliminate one of two pedestrian crossings across Vine Street for these streets and connect some buildings on the north side to the cap. However, open spaces would be more disconnected from each other than the other two concepts.

This cap would be longer than 800 feet. Caps that are longer than 800 feet will require additional ventilation, fire safety, modifications to the structure to accommodate vertical clearance requirements, potential right-of-way acquisition for life safety apparatus, lighting for I-676, and ADA compliant evacuation infrastructure for the Vine Street Expressway.

Compared to the Two-Block concept, this concept would require significantly more cost, time, and traffic disruption during construction. The estimated construction duration would be 5-8 years.

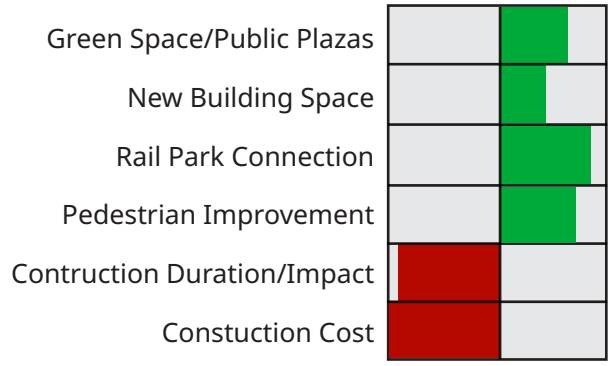
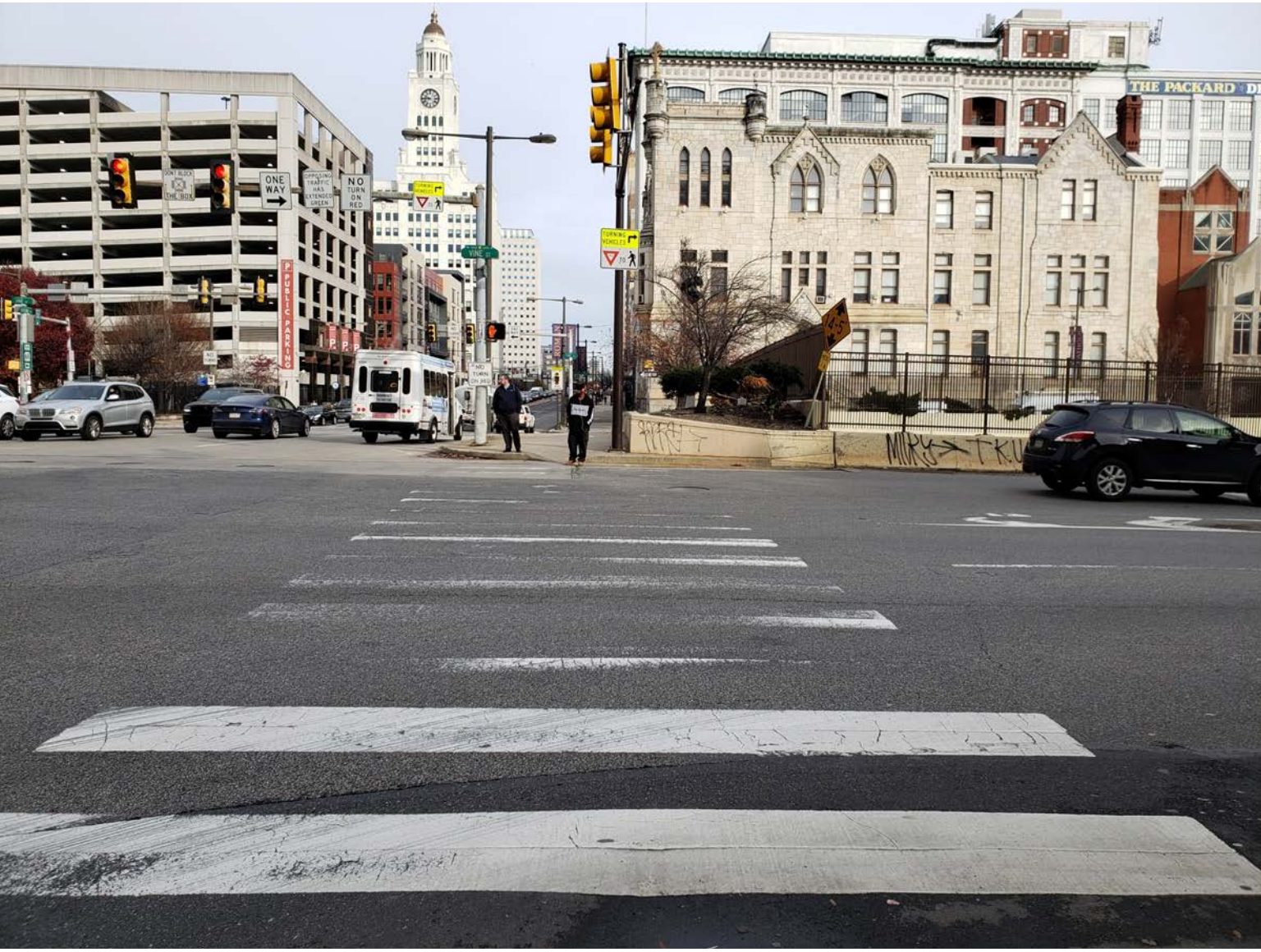


Table 7: Cap Design Concept 3 Key Factors


ONE WAY
NO TURN ON RED
PUBLIC PARKING
VINE ST
THE PACKARD

Design Concept	Issues Encountered
3 Blocks Capped & Eastbound Local Vine Street Shifted North	• South side driveways and access to Convention Center loading dock would impact open space area. • The northern and southern sections of the park would be bisected by Vine Street, the numbered streets, and driveway access creating a discontinuous feel. • More complex to construct in phases, due to shifting eastbound local Vine Street. • Creates a tunnel longer than 800 feet. • Loss of open space from 10th to 11th Steets and 12th to 13th Streets due, to the roadway shift. • More expensive than capping three blocks due to shifting eastbound Vine Street. • Similar but inferior to Concept 3.
3 Blocks Capped and Local Vine Street Shifted to the Center	• South side driveways and access to Convention Center loading dock would limit areas available for open space area. • More expensive than capping three blocks due to the shifting of both local Vine Street directions. • The entire park would be bisected by Vine Street, the numbered streets, and driveway access creating a discontinuous feel. • More complex to construct in phases due to shifting both eastbound and westbound local Vine Street. • Creates a tunnel longer than 800 feet. • Loss of open space from 10th to 11th Steets and 12th to 13th streets, due to the roadway shift. • Similar but inferior to Concept 3.
One-Block Cap	• Provided smallest area for open space. • Would still require ADA and signal upgrades at two of the numbered cross streets. • Does not sufficiently meet community aspirations. • Not cost effective for the limited benefit provided.

Table 8: Cap Design Concepts Investigated and Not Pursued

Design Concepts Cost Estimate

The Study Team reviewed cost data from the following cap projects and studies to develop high-level cost estimates for comparison purposes.

- PennDOT State Route 676 Section PAB : Vine Street Expressway (I-676) overhead bridge replacement with partial caps at Family Court and Free Library, Philadelphia, Pennsylvania.
- PennDOT State Route 95 Section CAP: Interstate 95 cap at Penn's Landing, Philadelphia, Pennsylvania.
- PennDOT State Route 579 Section A10: Interstate 579 SEA Urban Open Space cap, Pittsburgh, Pennsylvania.
- Interstate Highway 35 Cap and Stitch Project: 4th Street to Cesar Chavez Street capping, Austin, Texas.
- New York State Department of Transportation Route 33 Kensington Expressway: Buffalo, New York.
- Colorado Department of Transportation Interstate 70 Elyria Swansea: Cover structure and park, Denver, Colorado.

Assumptions and Considerations

The study team needed to take into account certain assumptions and considerations to arrive at a cost estimate for each design concept.

Assumptions

- The study team assumed that the bridges carrying 10th Street, 11th Street, 12th Street, and 13th Street over the Expressway will require superstructure replacements when caps are installed directly adjoining the existing bridges.
- The study team assumed that road diet and streetscaping will be used to tie non-continuous cap structures together. This approach was used between 18th and 20th Streets for the I-676 overhead bridge replacement project. Partial caps were constructed to create Family Court Park (between 18th and 19th Street) and Shakespeare Park (between 19th and 20th Street), adjacent to the Benjamin Franklin Parkway.
- The study team assumed the cost of Fire and Life Safety systems for the enclosed Expressway using the Austin and Denver capping projects.

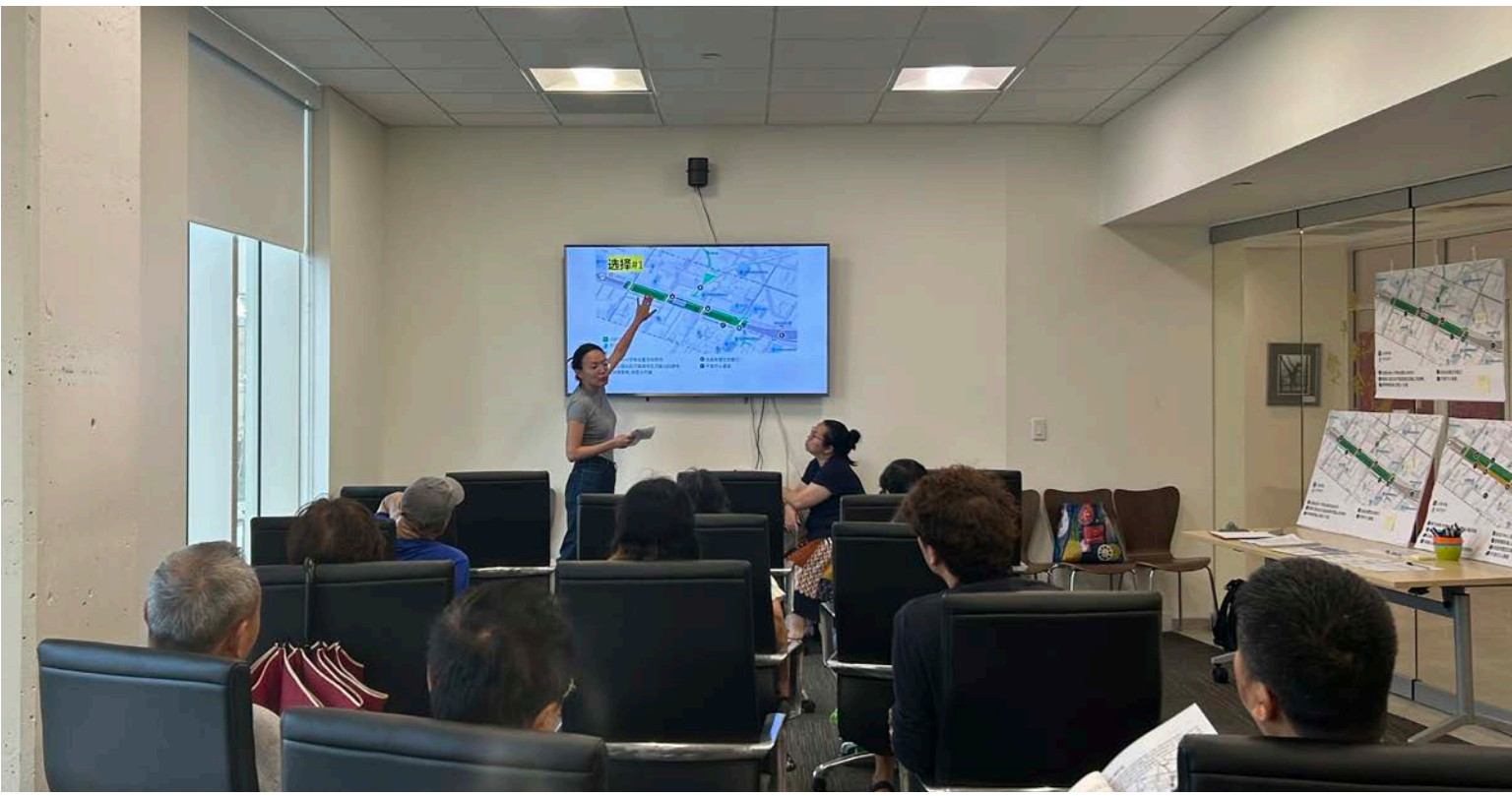
Considerations

The study team considered structural, roadway, streetscaping, landscaping, lighting, and drainage costs for the park.

- When the cover was longer than 800 feet, the study team considered the following additional costs:
  - Tunnel Traffic Diversion system during emergencies.
  - Tunnel Administration Building – to house control and data acquisition. systems for monitoring, managing, and controlling tunnel operations under normal and emergency conditions.
  - Pump station associated with firefighting deluge system.
  - Additional tunnel activities below local Vine Street for emergency egress and life support systems.
  - Annual tunnel maintenance and operation.

The study team was not able to estimate a cost for the following items. However, the study team would need to consider the following costs for any concept that would require significant tunnel considerations:

- Lowering the Expressway or raising the cap to accommodate jet fans for ventilation.
- Accommodating conventional highway guide signs placement.
- Cost of utility relocation for any tunneling activities below local Vine Street.



Public Engagement

The City, PCDC, and the study team arrived at three design capping concepts to share with the public. Next, the study team hosted a second round of public engagement.

Similar to the first round, this second round of public engagement included an in-person workshop, an online and paper survey, pop-up events. and focus groups.

Community Vision Workshop #2

On September 18, 2023, the study team held the second of two in-person Community Visioning Workshops. The workshop's location was the Chinese Christian Church & Center (1101 Vine Street) from 6:00 p.m. to 8:00 p.m.

This workshop was an open house. Community members could stop by at any time during the event to view display boards, and talk one-on-one with study team members.

The Community Vision Workshop #2 aimed to gain public feedback about the three design concepts for the Chinatown Stitch: Two-Block; Three-Block; and Three-Block: Vine Street Westbound to the Middle.

Attendees gave feedback on their preferred design alternative. They also shared what they liked and disliked about each design alternative, and which amenities they would like to have on each cap.

Thirty-nine (39) people signed into the Community Vision Workshop. Twenty-eight (28) attendees completed the exit survey. Of those who completed the exit survey, over half self-identified as Asian.

The study team promoted Workshop #2 through the following methods:

- Simplified Chinese and English flyers placed in Chinatown businesses and apartment buildings.
- Postcard mailing to 1,115 residences within the study area.
- City of Philadelphia, PCDC, DVRPC, and partner social media posts.
- Study website.
- Press release and local media coverage.

There were 11 display boards translated into Simplified Chinese and English. Of these boards, six were educational and five were interactive. Study team members were stationed at each display to explain the display topics and answer questions. PCDC provided two Mandarin and two Cantonese interpreters.

Overall, participants expressed interest in Concept 1: Two-Block and Concept 2: Three-Block with Full Coverage. They liked that the concepts had green space, a connection to the Rail Park, and the pedestrian bridge. They disliked turning the cap into a long tunnel.

Participants' top amenity choices were a market space, picnic/seating area, and a community garden. The factors that were most important to them were improving the pedestrian environment, adding green space and public plazas, and minimizing construction duration and impact on the community. Business representatives raised parking concerns in the broader neighborhood.

Please see Appendix F for the Community Vision Workshop #2 Board Displays and Summary.

Survey #2: Fall 2023

Between September 2023 and October 2023, the City and PCDC released a survey to gather input on the three cap design concepts and narrow the three down to a single preferred concept to advance further.

The study team released the 13-question survey electronically in English and Simplified Chinese.

The study team promoted the survey via:

- Simplified Chinese and English flyers placed in Chinatown businesses.
- Postcard mailing to 1,115 residences within the study area.
- City of Philadelphia, PCDC, DVRPC, and partner social media posts.
- Study website.
- Press release and local media coverage.
- PCDC-distributed paper surveys to community connections, Chinatown businesses, and clients.

The study team distributed the paper survey at two pop-up events and two workshops for Chinese-speakers as well as to Chinatown leaders.

In total, the survey received 726 responses. Respondents rated all three design concepts by six key factors: four positive factors, and two negative factors. Survey takers ranked the design concepts based on those six key factors.

Positive Factors

- Amount of green space.
- Potential buildings along or on the cap.
- Safer streets for people walking and biking.
- Ease of connection to the Rail Park.

Negative Factors

- Construction duration and impact on the surrounding community.
- Construction cost.

Overall, on a scale from 1 (lowest) to 5 (highest), survey respondents ranked Concept 2 the highest, with Concept 1 rated almost as highly. Those survey takers who identified as Asian rated Concept 1 and 2 about equally. All others rated Concept 2 slightly higher (Figure 13).

Survey takers were also asked to rank the importance of the six factors. Overall, respondents ranked “Improve the pedestrian environment (people walking and biking)” and “Add green space and public plazas” as the top two most important factors. The counts for those two factors are much higher outside of Chinatown.

Among Asians who live in Chinatown, respondents ranked “Minimize construction duration and impact on community” as the third most important factor. For respondents who work in or own a business in Chinatown, they ranked construction duration as the number one priority.

Please see Appendix G for Survey #2 Summary.

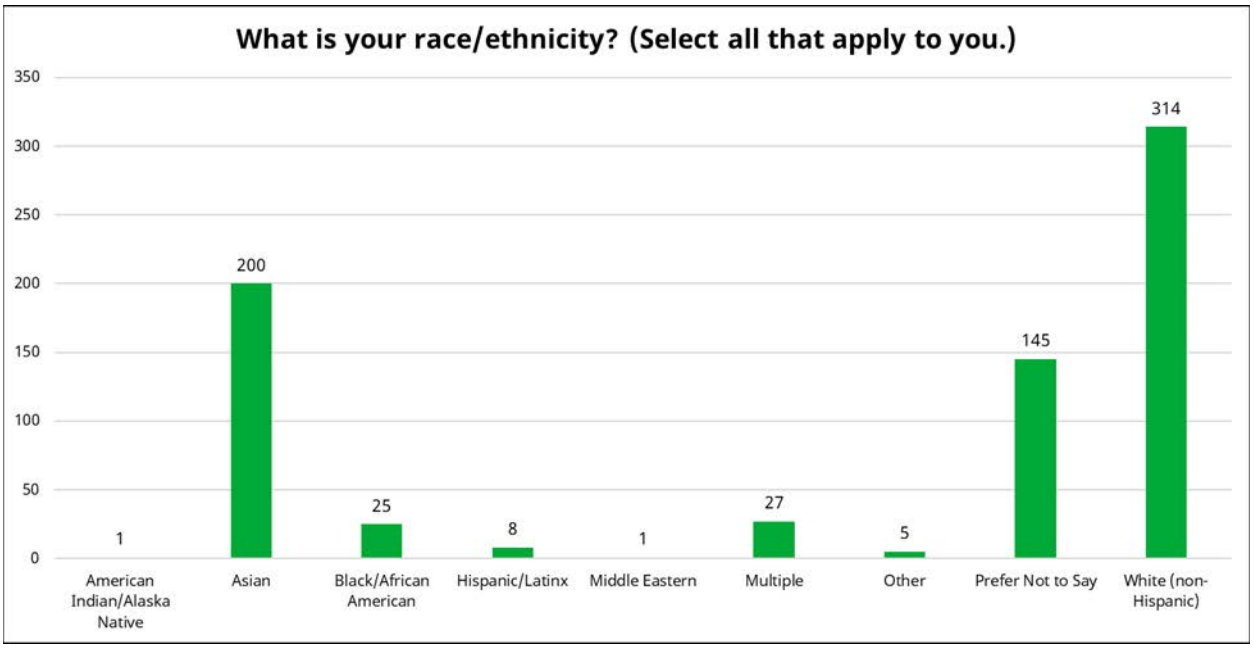


Figure 12: Race/Ethnicity of Survey #2 Participants (paper and electronic surveys)

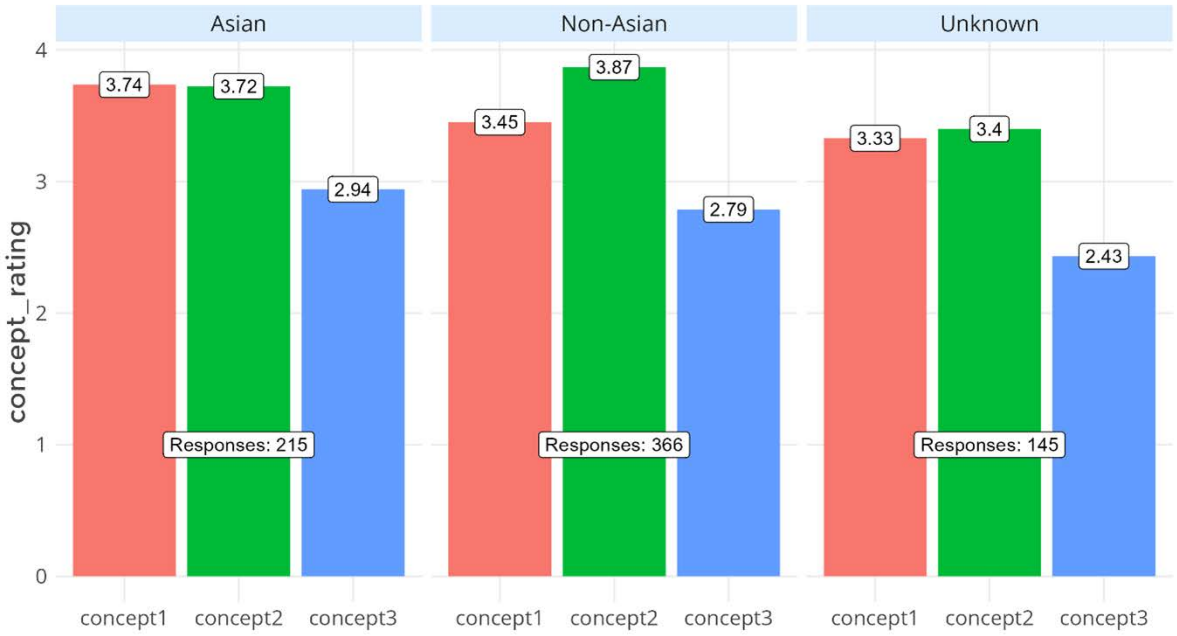


Figure 13: Averaged Concept Ratings by Race of Survey #2 Participants (paper and electronic surveys)

PCDC Chinatown Engagement

Being able to participate in engagement in one's own language is a cornerstone of equity. PCDC assisted with public engagement in Chinatown. PCDC reached Chinatown residents, businessowners, and community members, as well as limited English and non-English speaking populations.

As done during Phase 1, PCDC's activities included distributing the survey, hosting pop-up events, and canvassing businesses in Chinatown. By engaging people where they were, pop-up events and canvassing were quick and casual ways of hearing from members of the community. PCDC could engage with people who could not attend a traditional public meeting.

The study team that canvassed Chinatown businesses explained the project to business owners and guided them through the survey. The team members also hung informational flyers in business windows.

Activities included:

- Hosted two pop-up events:
  - September 18, 2023: Crane Community Center.
  - September 30, 2023: Mid-Autumn Festival.
- Distributed surveys to Chinatown community leaders (e.g., church leaders, Chinese American Women's Sisterhood Society, well-connected residents).
- Hosted two workshops for Chinese-speakers.

PHASE 3: SHARING THE COMMUNITY VISION

Capping Concepts Decision Matrix

A decision matrix is a tool that evaluates and prioritizes a list of options. The study team established 12 criteria and weighed the criteria from 0% to 100%. The study team developed the criteria based on the Study Vision, Project Goals, and additional feedback from community engagement.

The study team then evaluated the three design concepts against the 13 criteria. There was a scale of one to four. On the scale, a "one" met the criteria the least, "two" met the criteria very little, "three" met the criteria somewhat, and "four" met the criteria the most. The study team used the following criteria:

Study Goals/Survey #2 Positive Factors
The goals were the result of public engagement. They were also used as the four positive factors in Survey #2. Because the Chinatown Stitch must meet these goals, these criteria were given the highest weight (10% each). The remaining criteria were equally weighted at 7.5%. The study team ranked each design concept on how well it met each goal.

- **Goal:** Create an inviting park space with landscapes and public plazas.
- **Goal:** Include public civic buildings, facilities, and businesses that serve community needs.
- **Goal:** Prioritize the elderly, young, and those with disabilities.
- **Goal:** Create a safe street design that extends the Chinatown neighborhood feel

Rail Park Connection
The study team identified the connection to the future Rail Park north of Vine Street, between 11th and 12th Streets, as important in public engagement. The study team ranked the Design Concepts on how well they can connect to the future Rail Park.

Survey #2 Negative Factors
Construction duration and impacts could affect the Chinatown community negatively. The construction cost could also be prohibitively expensive, resulting in the project being delayed by years or decades or never being built. The study team ranked the Design Concepts by least negative impact on the surrounding community, and the lowest cost.

Operations & Maintenance Needs

A significant element of Chinatown Stitch's long-term success would be the implementation of a reliable and sustainable operation and maintenance framework. The cost of operations and maintenance is an important factor to balance with the future amenities. The study team ranked the Design Concepts by lowest operations and maintenance needs.

Engagement Audiences

Based on the results of Survey #2, the study team used the ranking score of each engagement audience to rank each Design Concept.

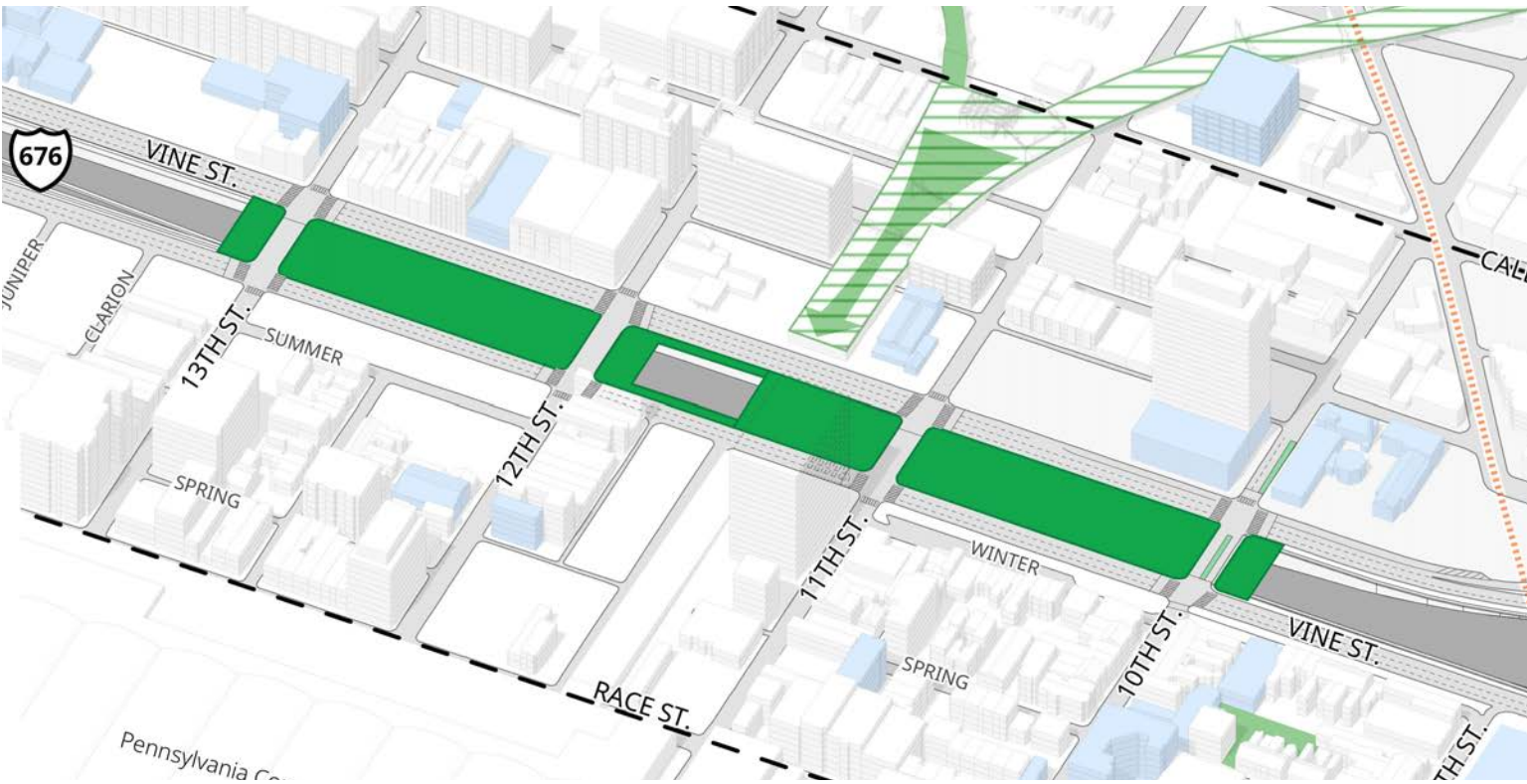
- Ranking from Asian Respondents.
- Ranking from Chinatown Business Owners and Workers.
- Ranking from Chinatown Residents.
- Ranking from Overall Survey Respondents.

Results

As a result of the decision matrix exercise outlined above, **Concept 1: the Two-Block cap is the highest ranked alternative**.

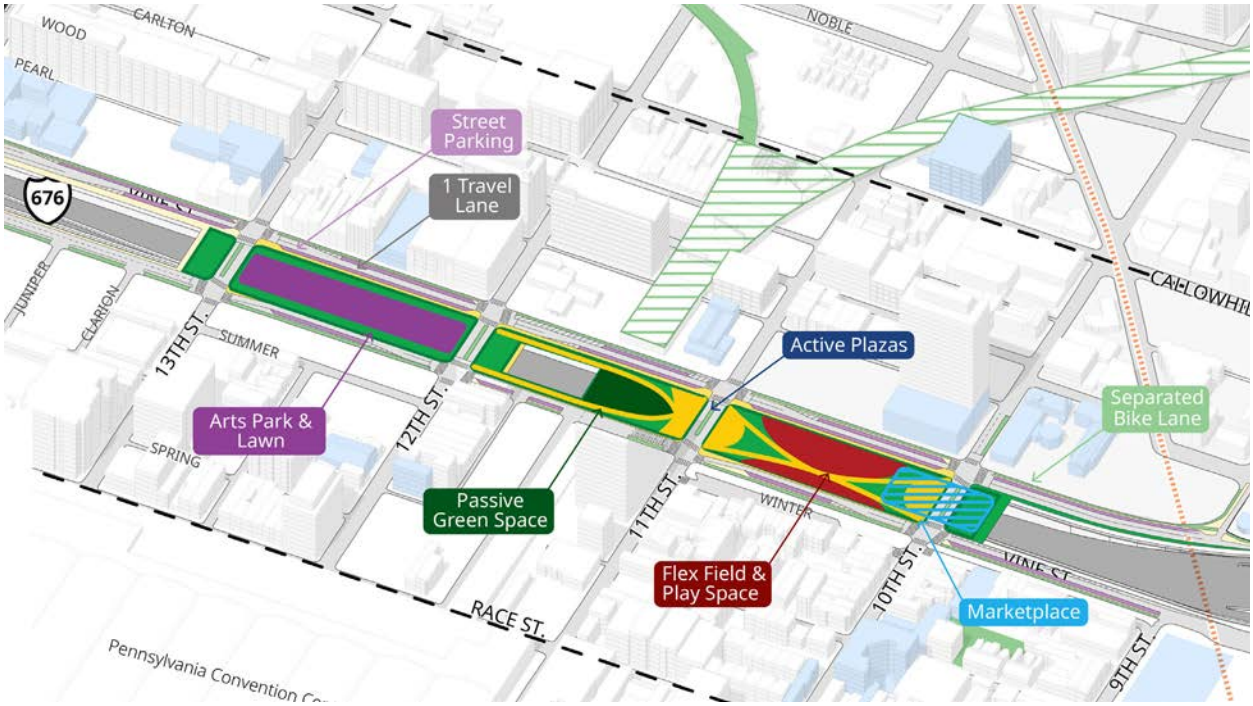
The Two-Block cap is the design that would best achieve the goals and vision for the study, while minimizing the negative impacts. The Two-Block cap scored just slightly lower in preference during the survey. But the lower cost and quicker implementation helped set Concept 1 above Concept 2 in the overall ranking.

Please see the full Decision Matrix in Appendix H.

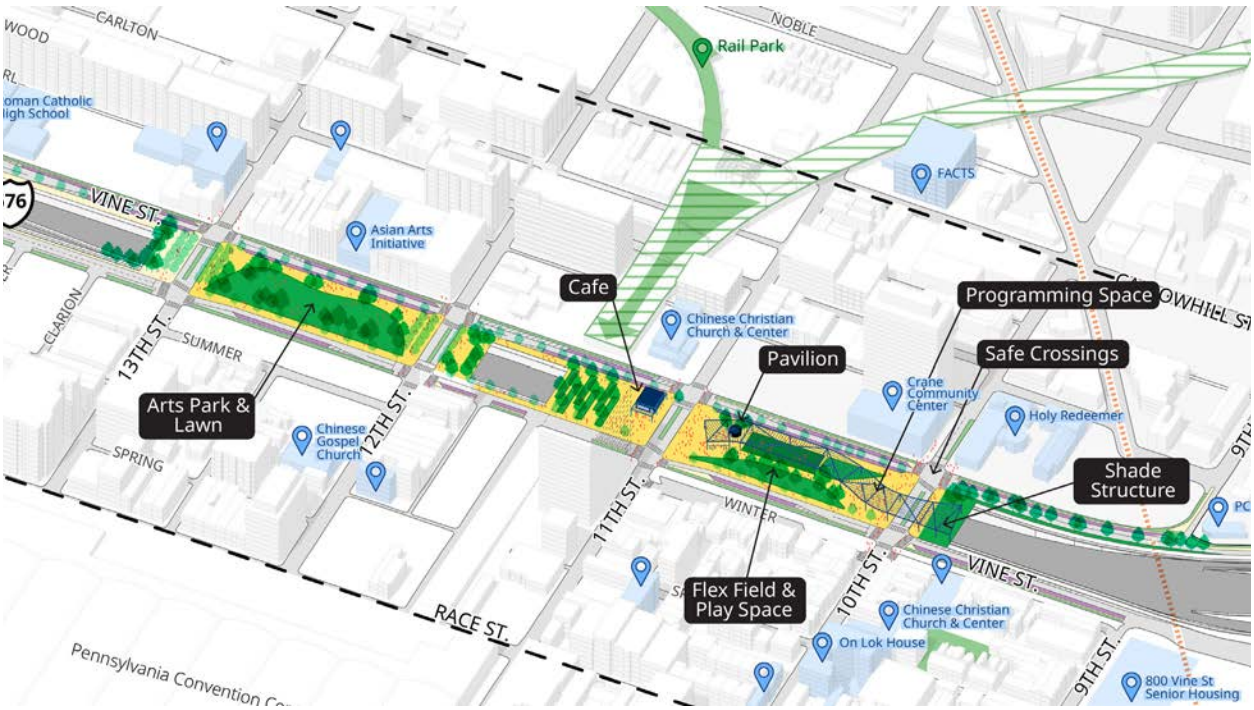


Preferred Design Concept: Rendering of the existing conditions of the Two-Block Cap Design Concept

Preferred Design Concept: Rendering of the proposed conditions of the Two-Block Cap Design Concept



Preferred Design Concept: Two-Block Cap Design Concept with Traffic Calming and Streetscape Improvements to the Local Lanes



Preferred Design Concept: Two-Block Cap Design Concept with Traffic Calming and Streetscape Improvements to the Local Lanes

VINE STREET LOCAL LANES ALTERNATIVES

Vine Street Concerns

Vine Street Local Lanes & Road Users

Public engagement for the Chinatown Stitch Study included understanding how the local Vine Street lanes can be improved. The public engagement also aimed to hear from community members about which uses should be prioritized on the streets going around and through the project. By "Vine Street," the study team means the two east-west local streets to the north and south of the Vine Street Expressway.

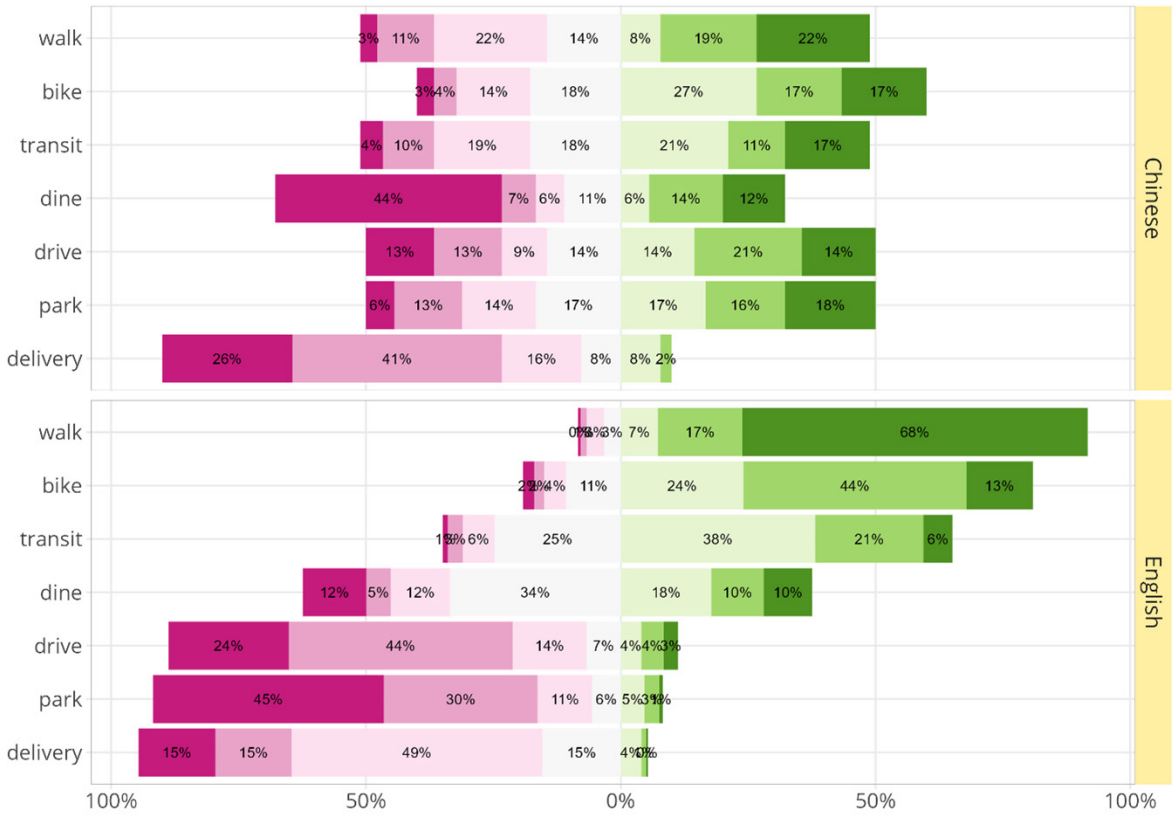


Figure 14: Ranking Priorities by Survey Language of Survey #1 Participants (paper and electronic surveys)

The first electronic survey asked survey takers to prioritize various street users. Respondents who took the survey in Chinese and in English prioritized people walking or using mobility aids, such as wheelchairs or walkers.

For respondents who took the survey in Chinese, people driving came next, then parking, followed by people biking, using the road space for shopping, dining, or socializing, and finally, people making deliveries.

The respondents who took the e-survey also had the opportunity to give suggestions on how to improve the Vine Street local lanes in an open-ended format. At Community Visioning Workshop #1, attendees shared their issues or ideas for the Vine Street local lanes on sticky notes. Issues included:

- It is unsafe to bike.
- Traffic is too fast.
- Light is too short for pedestrians to cross Vine Street safely.

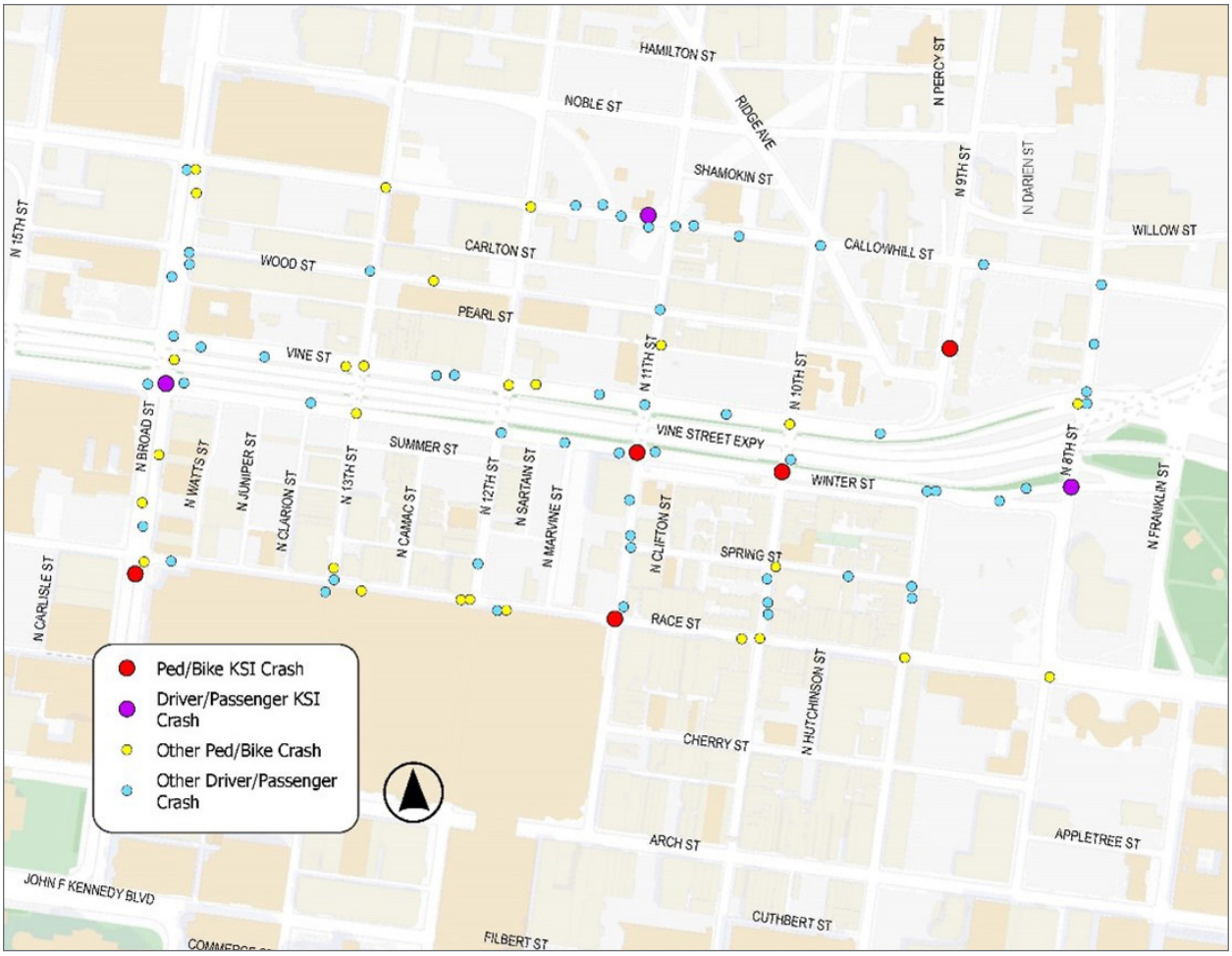


Figure 15: Study Area Crash Map

Ideas to improve the Vine Street local lanes included:

- Install parking-protected bike lanes.
- Implement Leading Pedestrian Intervals, which delay red lights so pedestrians can cross first and slow local traffic.
- Implement a road diet.
- Install bump out all curbs to shorten pedestrian crossing lengths to make it safer to cross and slow local traffic.

Safety Analysis

Vine Street, 10th Street, and Race Street within the study limits are all part of the City of Philadelphia's Vision Zero High Injury Network. The **High Injury Network** identifies corridors with the highest rates of fatalities and serious injuries per mile.

The study team analyzed the 2018 – 2022 crash rates within the study limits. The analysis included general crashes, crashes with fatalities and/or serious injuries, and pedestrian bicycle crashes.

All three of these crash reports showed the study area has a crash rate that was higher than Philadelphia's citywide average. The study area's general crash rate was 3.5 times higher than the citywide average. The study area's fatal and serious injury crash rate was 2.5 times higher than the citywide average. And the study area's pedestrian-bicycle crash rate was 4 times higher than the citywide average.

Intersections of note with fatal and serious injury crashes were eastbound Vine Street at 10th and 11th Streets.

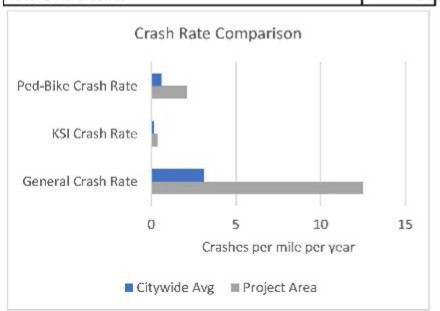
Concurrent Actions

PennDOT has a Highway Safety Improvement Project planned for the local Vine Street lanes in response to safety concerns.

This project is planned to include a road diet along Vine Street. A "road diet" reduces the number of travel lanes or the width of the roadway to allow for effective safety improvements. Road diets are a Federal Highway Administration proven safety counter measure.

Crash Summary
Surface Streets (Race - Callowhill, 8th - Broad)
2018-2022

Total Crashes	312
People Involved in Crashes	839
Total Fatalities	2
Total Serious Injuries	7
Crash Rate by Route Length (crashes/mile/year)	12.5
Total KSI Crashes	9
KSI Crash Rate by Route Length (crashes/mile/year)	0.4
Total Ped Crashes	38
Total Bike Crashes	14



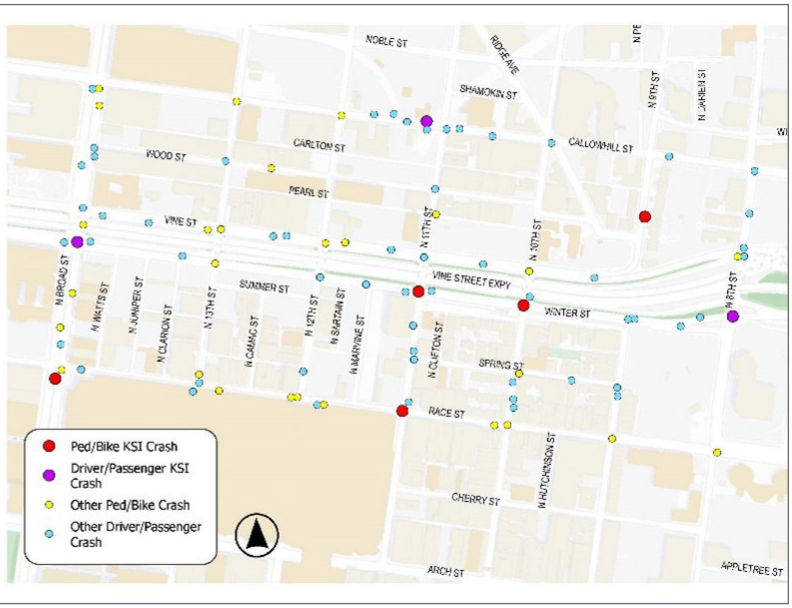


Figure 16: Study Area Crash Rate Summary and Comparisons

Benefits of road diets may include:

- Reduced vehicle speeds and traffic calming.
- Shorter crossing distances for people walking.
- Wider sidewalks.
- A curb-separated bike lane.
- Reduction in crashes.
- Community focused Complete Streets environment.

The project is currently scoped to include a single-lane reduction (keeping two through lanes of traffic) from Vine Street westbound from 9th Street to 12th and Vine Street eastbound from 8th Street to Broad Street along with removal of parking on Vine Street westbound.

The project plans to also include curb bump outs, a separated bicycle lane on eastbound Vine Street from Broad Street to 8th Street, and a bus boarding island at 10th Street and eastbound Vine Street. The plans also include a new signal at 9th Street and westbound Vine Street, and ADA ramps at all intersections. These recommendations come from the DVRPC Reviving Vine report and will be confirmed and further developed over the next year

Local Lane Alternatives Considered

The Chinatown Stitch study presents a new opportunity to pursue a more drastic road diet on Vine Street in order to have the most drastic improvement in traffic safety.

As part of this concept development process, the Delaware Valley Regional Planning Commission (DVRPC) concurrently analyzed the impacts to traffic of several road diet alternatives.

DVRPC analyzed the impact of road dieting to the local roadway network on the study area surrounding the proposed highway cap.

DVRPC also estimated the traffic volumes within the study area during the year 2050, and local transportation projects to develop the 2050 No Build Conditions.

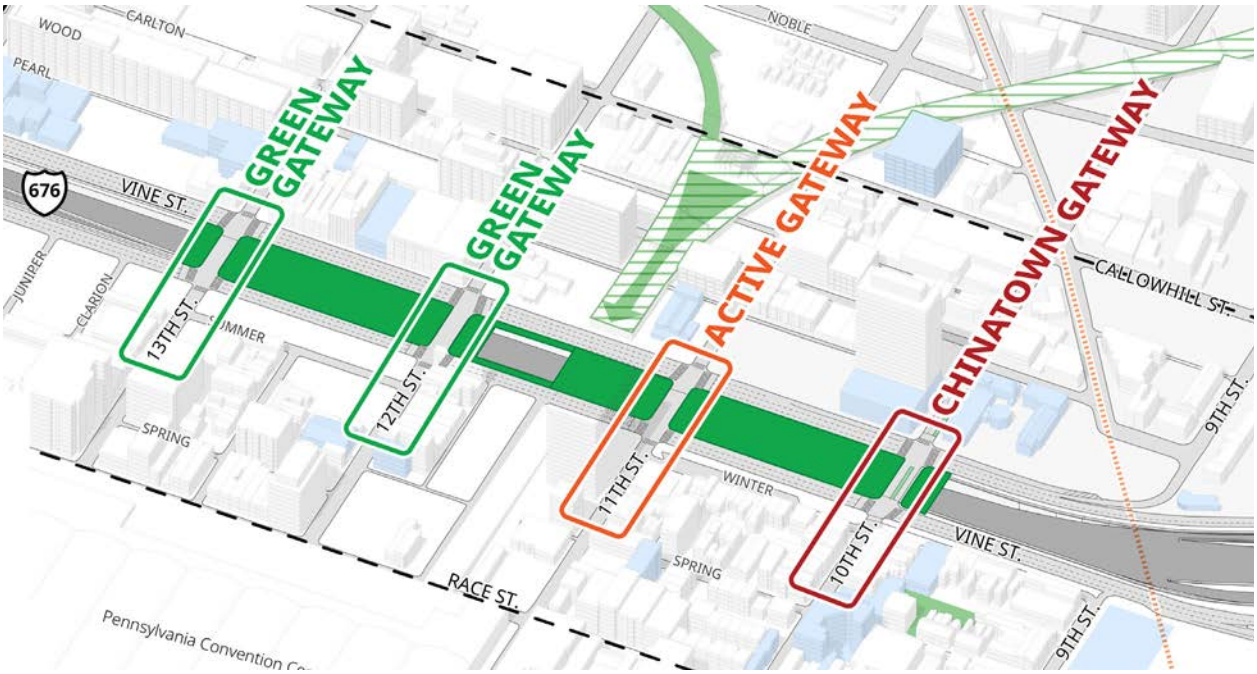
The study team studied three configurations of Vine Street:

- Base Alternative – Highway Safety Improvement Project.
- Build Alternative 1: One lane along eastbound Vine Street and one lane along westbound Vine Street.
- Build Alternative 2: One lane along eastbound Vine Street and two lanes along westbound Vine Street.

DVRPC used its regional travel demand model to estimate potential traffic diversion to parallel facilities due to capacity reduction.

In both build alternatives, DVRPC also included the installation of a traffic signal at 9th Street and westbound Vine Street, as well as intersection realignment at 8th Street and eastbound Vine Street. In the build models, DVRPC performed signal optimization along both eastbound Vine Street and westbound Vine Street.

One metric to evaluate the Build Alternatives is by Level of Service. This is a transportation engineering method used to quantify motor vehicle traffic conditions. The Highway Capacity Manual uses letter grades, “A” (least congestion) through “F” (most congestion) to describe vehicle congestion and average delay (in seconds) by turning movement, intersection approach, or entire intersections.



Preferred Design Concept: Two-Block Cap Design Concept with Traffic Calming and Streetscape Improvements to the Local Lanes

The goal of traffic operations is to maintain a reasonable traffic flow and the target letter grade will vary depending on context -- in fact, an "A" often indicates there is too much capacity that may induce speeding at off-peak times.

Under the 2050 Base Alternative Build Conditions, which includes the PennDOT's Highway Safety Improvement Project, all intersections within the study area would operate at levels of service D or better during both peak hours.

But there are exceptions in the 2050 Base Alternative: 11th Street and westbound Vine Street, which would fails during the a.m. peak hour, 11th Street & Vine Street Eastbound, which would fails during the p.m. peak hour, and 10th Street and Vine Street Westbound, which would have a level of service E during the a.m. peak hour.

All intersections in Build Alternative 1 would operate at levels of service D or better during both peak hours. All intersections in Build Alternative 2 would operate at levels of service C or better during both peak hours.

Build Alternative 1 would provide the most significant increase in traffic safety by reducing weaving, slowing traffic, shortening pedestrian crossing distances, and providing separated space for cyclists. Build Alternative 1 also creates the possibility for additional on-street parking adjacent to the cap.

Build Alternative 2 shares many of these features with Build Alternative 1, but to a lesser degree. All of the road diet alternatives would have significant safety benefits on its own. It is also possible that the study team could layer additional safety measures, such as speed cushions and enhanced crosswalks.

Please see the full Traffic Modeling Study in Appendix I.

Continuation of Analysis

The study team evaluated local lane alternatives based on how they achieved the desired goals of the project. The study team also considered the possible congestion impacts.

All of the alternatives would implement a road diet, or reduction in traffic lanes, from the current condition. Traffic congestion would be made worse by a road diet in the vicinity of Broad Street and further west, and near 9th Street and further east. For this reason, none of the road diets go east of 10th or west of 13th.

But between 10th and 13th the current lane configuration has excess capacity for many hours during the week. This excess capacity leads to many of the speeding and reckless driving complaints that were heard throughout the engagement process.

The study team recommends additional analysis and community engagement in order to select a preferred alternative for the local lanes. All three alternatives would continue to be considered in 2024.

Preferred Design Concept: Two-Block Cap Design Concept with Traffic Calming and Streetscape Improvements to the Local Lanes

The Two-Block cap, which spans closer to 2.5 blocks, meets the communities' goals and vision. The Two-Block cap would create a green space and a safe street design, and also minimize the construction duration.

This option allows for phasing. The City could begin construction while securing funding for the remaining portions. Between 11th and 12th Streets there would be an open gap to allow for ventilation for the Expressway below.

The Two-Block cap could be constructed in two phases. The first phase would be to construct a cap between 10th Street and approximately halfway between 11th and 12th Streets. This location could potentially link the Chinatown cap to the Rail Park in the future using the existing Reading Railroad viaduct. The second phase of the highway cap would be built between 12th Street and 13th Street.

The required ventilation opening will be sized and the exact limits of the cap would be determined in a future design project. These limits would be greatly influenced by the limitations on the covered length of the highway to avoid classification as a tunnel requiring active ventilation and fire suppression systems by PennDOT and Federal Highway Administration.

The opening in the Expressway cap would ensure air quality beneath the cap would

remain at safe levels. Any air pollutants from the Expressway would be channeled up and away from the neighborhood or the cap.

The study team reviewed bridges in the study area and the nearby caps that have been constructed (I-676 partial caps at the Free Library's Central Branch and Family Court) or are under construction (I-95 cap at Penn's Landing). As a result, the study team expects the Chinatown Stitch would most likely be supported on steel I-beams.

The study team would need to understand the desired use and amenities of the new cap to ensure the structure can support the loads while also ensuring the superstructure depth will not create vertical clearance issues on the Expressway.

The community has expressed a desire for a market space, picnic/seating area, and a community garden. At this time, the exact uses and amenities have not been determined. The study team has not conducted a structural analysis of the existing retaining walls. Currently, the study team anticipates that the existing retaining walls would remain in place. Modifications to the retaining walls could allow for the Expressway cap to span over the walls.

The original retaining walls were designed mainly to resist lateral earth pressure and surcharge loads from the planters and local Vine Street traffic. The study team would need to determine if the existing walls are structurally adequate to support additional loads imposed by the cap and amenities. If the existing walls are structurally sufficient, then the top of the wall could be reconstructed to provide beam seats for supporting the cap superstructure.

Alternatively, a potential approach for supporting the cap without imposing additional loads on the existing walls would be to install an independent stub abutment with a micropile foundation behind the wall. This technique was used in the I-579 SEA Urban Open Space cap in Pittsburgh.

Two-Block Design Concept Cap Cost Estimate

The study team expects the preliminary construction cost estimate for Phase 1 of the Two-Block design concept at about $160 million. This is a preliminary estimate and could change throughout the design process.

Phase 1 would include caps for the full block between 10th and 11th Streets, and an extension for the cap from the 11th Street bridge towards 12th Street. The cost also includes the proposed work along Vine Street from 8th Street to Broad Street, on both the eastbound and westbound directions.

This $160 million cost involves about $35 million to improve the Vine local lanes , $97 million to build the cap (including the bridges carrying 10th and 11th Streets), $17 million for a pedestrian bridge at 9th Street, and $11 million for a bridge connecting the cap with the future Rail Park along the Reading Railroad Viaduct.

The total project costs are approximately $575/sq-ft across the entire project area. The capped area cost is approximately $950/sq-ft. This compares to a range of $353-$1,100/sq-ft (in 2023 dollars) for other cap projects (both constructed and planned) throughout the country. The Big Dig in Boston, Massachusetts is an outlier at $15,081/sq-ft.

Equity Analysis

Econsult Solutions, Inc. performed an Equity Analysis on the Two-Block Cap.

The Equity Analysis addresses the degree to which the design concept promotes racial equity, addresses barriers to opportunity, and serves underserved communities.

The Chinatown Stitch would primarily benefit Chinatown residents. Visitors to the neighborhood—which includes a popular commercial corridor—would also benefit. In addition, the equity analysis focused on residents of Census Tracts 2 and 376 that include Chinatown. This Chinatown population is expected to experience the greatest positive impact.

The U.S. Department of Transportation and the Bipartisan Infrastructure Law define Historically Disadvantaged Communities and Areas of Persistent Poverty. These indexes can be used to identify places that have experienced barriers to opportunity or disadvantages over an extended period of time. Both of the indexes also incorporate multiple variables, including income. Neither Census Tract in the study area has been identified as Historically Disadvantaged. However, both Census Tracts in the study area have been identified as Areas of Persistent Poverty. The cap and potential amenities will improve conditions in this neighborhood for all populations, including the populations in poverty.

By making walking more appealing, this project has the potential to reduce vehicular traffic. Such a mode shift would reduce vehicle emissions, leading to improved air quality.

The study team anticipates that the addition of green space, in place of an open Expressway, would also help to improve air quality.

The U.S. Environmental Protection Agency tracks measures of Environmental Justice. The Environmental Justice measures seek to address inequities of environmental protection facing communities with large minority or low-income populations. These indexes show air quality in the area near the Chinatown Stitch is much worse than Pennsylvania or the country.

Additional considerations for an equity analysis are the transportation needs of the population, access to those needs, and differences in those factors among different population groups.

Using the U.S. Census' American Community Survey data on vehicle ownership, the percent of households without vehicles near the study area is higher than in Philadelphia and Pennsylvania. Transportation needs can also be assessed through data on commuting patterns. In the study area, fewer people drive to work, and more people walk compared to Philadelphia and Pennsylvania.

The Equity Analysis shows that the project would directly benefit minority populations and areas of persistent poverty. These populations have a direct need for the type of project described in this analysis. For this study, people living in the study area around the Chinatown Stitch have a greater need for pedestrian infrastructure than the overall population.

Please see the full Equity Analysis report in Appendix J.

Maintenance and Operations

A significant element of the Chinatown Stitch's long-term success will be the implementation of a reliable and sustainable operation and maintenance framework.

Maintenance needs for the Chinatown Stitch include the cap "topside" amenities and the cap structure. The "topside," demarcated as anything above the waterproof layer, would be owned by the City. The City would be responsible for day-to-day maintenance. Anything below the waterproof layer would most likely be the responsibility of PennDOT.

The study team anticipates the following maintenance and operations activities apply to the Chinatown Stitch's topside amenities:

- Security and lighting.
- Hazardous materials/drug paraphernalia disposal.
- Outreach to people who are unhoused.
- Graffiti abatement.
- Public trash cans being used as household trash cans.
- Landscape care
- Repairs to specialty materials and amenities, e.g. benches, paving, buildings, sports courts

The study team would need to take into account considerations for public communication regarding maintenance needs and activities.

Any operation and maintenance framework should include methods for receiving public comments. The study team should also fold existing landscaping activities on Vine Street into the proposed framework to ensure continuity of service.

- The study team should design cap amenities with an understanding of maintenance requirements.
- The proposed operations and maintenance framework must provide stability and a sound financial structure. The study team would need to sustain this valuable community asset in a state of good repair.

The study team did not calculate the operations and maintenance costs of the cap, but it will be significant, totaling millions of dollars per year.

The study team emphasizes the importance of having reliable revenue sources in place to adequately fund the maintenance. The Stitch needs reliable funding so it can continue to be a benefit to the community for years to come.

Furthermore, the study team cautions that initial operations and maintenance funds would need to be generated in advance.

Possible revenue sources include lease payments for any structures on the cap, concessionaire payments for commercial activities on the cap, sponsoring and special programing, some type of special tax increment such as a Business Improvement District or Tax Increment Financing, and parking revenues.

The success of the Chinatown Stich depends on developing and dedicating sufficient, on-going revenue sources for operations and maintenance.

Please see the full Maintenance and Operations Memo in Appendix K.

NEXT STEPS

Planning, Engineering, and Construction

The City of Philadelphia released an RFP on September 25, 2023 to hire a consultant to conduct preliminary engineering for the project.

The preliminary design and engineering will take place in 2024-2025. The City anticipates submitting an application for federal funding for the remaining engineering and construction funds of the Chinatown Stitch through the Infrastructure Investment and Jobs Act (IIJA). If funding is received, the City anticipates that construction could start as early as 2027.

The City encourages residents and business owners to continue to follow the project and provide feedback at future milestones throughout the engineering and construction process.

This preferred Two-Block Cap concept is only the start of the planning process. The concept sets the broad parameters for the projects. But there remain substantial additional questions that will need to be answered over the next two years.

As part of preliminary design and engineering, the City will advance the project to 30 percent design. Environmental Review activities, which include the National Environmental Policy Act review, will evaluate the impact on the human and natural environment. The 30 percent design goal represents a critical milestone on the project's path to construction.

Key activities to advance the cap include: structural analysis and design, further evaluation of tunnel conditions, and scoping for connections at 9th street and to the Rail Park.

The top side amenities would need to be determined in the next phase. These top side amenities could include basketball courts, green space, benches, or green, park, or open space use. Any structures on the cap would need to be determined in the next phase. These structures could include retail, residential, commercial, office, or public use.

Key activities to advance improvements to the Vine local lanes include confirming and further developing the recommended alternative. Exact design considerations include lane markings and layouts, curb line changes, draining, streetscape, and lighting.

The study team will need to work with the community to consider curbside uses. Multiple competing uses will need to be balanced, including parking, loading and delivery, pedestrian spaces, and greening.

People can view updated information about the project and sign up for email updates on the project webpage: **https://www.phila.gov/programs/complete-streets/projects/the-chinatown-stitch-reconnecting-philadelphia-to-vine-street/**.

Community members are also encouraged to email questions and feedback to the Office of Transportation, Infrastructure, and Sustainability (OTIS) at: **otis@phila.gov**.

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- Philadelphia Chinatown Development Corporation, including John Chin, Caroline Aung, and Yue Wu
- Members of the Steering Committee
- Members of the Community Collaboration Committee
- Members of the Community Advisory Group
- Members of the Technical Committee

McCormick Taylor was the lead consultant for the study assisted significantly by Interface Studios. Additional consultants include Enconsult Solutions, Inc.

APPENDICES

A: Peer Cities Highway Capping Memo

B: Committee Members

C: Community Vision Workshop #1 Board Displays and Summary

D: Survey #1 Summary

E: Vine Street Aerial

F: Community Vision Workshop #2 Board Displays and Summary

G: Survey #2 Summary

H: Decision Matrix

I: Traffic Modeling Summary

J: Equity Analysis

K: Maintenance and Operations Memo


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