



South Campus Neighborhood Project

Transportation Study

Ivy Street & Chestnut Street Redesign

CONCEPTS

Prepared By

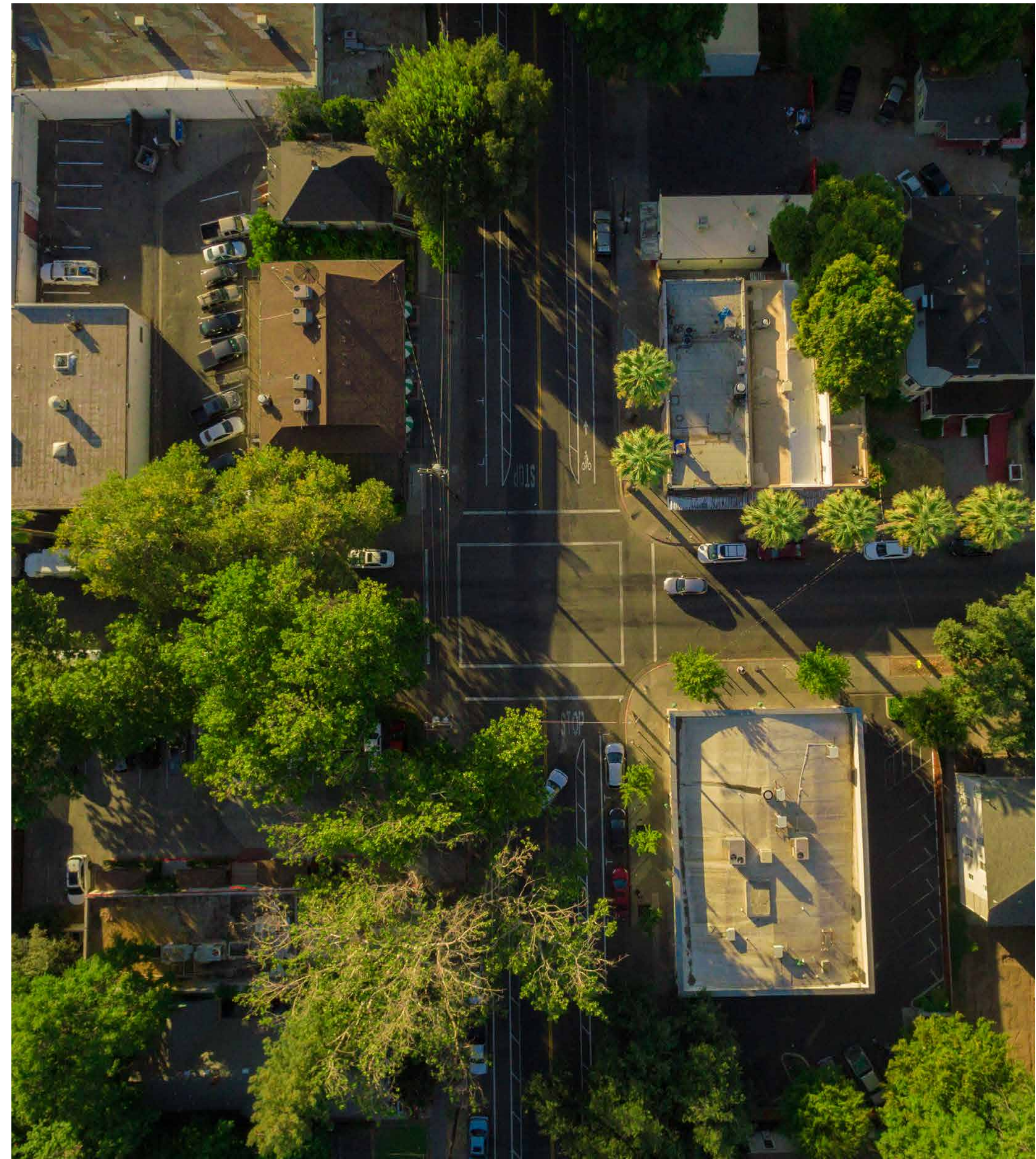
Jason T. Barnum

Engineering 140: Transportation Planning & Surveying | Spring 2018

Department of Civil Engineering, College of Engineering,

Computer Science & Construction Management

California State University, Chico



Resilient Cities Initiative
Institute for Sustainable Development
California State University, Chico

The South Campus Neighborhood Project

The South Campus Neighborhood Project is an award-winning neighborhood improvement planning effort coordinated by the Resilient Cities Initiative at California State University, Chico and the Public Works-Engineering Division at the City of Chico, CA. The project is focused on the public rights-of-way in Chico, California's South Campus Neighborhood, a six by seven square-block area bound by 2nd Street to the North, 9th Street to the South, Orange Street to the West and Salem Street to the East. Immediately adjacent to both downtown Chico and the University, it is Chico's oldest residential neighborhood and was laid out by the town's founder, John Bidwell, in the 1860's.

The neighborhood today is densely populated with university students and is also home to a number of small businesses, restaurants, bars, churches, community organizations, a school, a fire station, a police station, a railway station and transit center. Given its location, population and mixed uses, the neighborhood faces a unique set of circumstances and challenges. This three-year project aims to assess existing conditions and to develop and refine neighborhood improvement concepts to address a range of identified issues. The neighborhood improvement planning process is focused on concepts for complete streets and public works that will enhance public health and safety, quality of life, sense of place and environmental sustainability.

➤ *More information can be found online at <http://scnpchico.com/>*



City of Chico Public Works-Engineering

The overall Mission, Vision and Goal of the City of Chico Public Works Department is to provide the best possible Quality of Life through our abilities to protect, plan, construct and maintain the physical assets of the City. This is achieved through teamwork, integrity, professionalism, innovation, respectful customer service, value to the citizens of Chico, accountability and stewardship of the City's infrastructure and public resources. We serve the public in a manner that supports the rich heritage of Chico, as well as progressing into future improvements desired by the community in a sustainable manner. We continue to look for new technology that assists in meeting these goals so that we can operate at the most efficient level and continue to be at the leading edge of modern standards.

Our Mission, Vision and Goals include ensuring public safety through detail oriented and strategic improvements to mitigate unsafe operation and use of our Public property; Providing safe, sustainable, integrated and efficient transportation systems to enhance the City of Chico's economy and livability for all modes of transportation; Efficiently and effectively providing a reliable, sustainable and cost effective sanitary sewer and storm water collection system for our residents and businesses in-line with our overall Mission and Vision. We are stewards of the natural environment and through responsible practices, we construct and maintain our natural environment to the highest of standards. We will continue to make the City of Chico a leader in sustainable and clean practices so that our residents can experience the quality of life that is desired for an infinite length of time.



Public Works-Engineering

City of Chico, California

The Resilient Cities Initiative

The Resilient Cities Initiative (RCI) is an interdisciplinary university-community partnership program established by the Institute for Sustainable Development at California State University, Chico in 2016. The RCI connects real-world community sustainability projects— identified and funded by partner agencies— with faculty expertise and student innovation from departments and disciplines across the University’s academic colleges. The RCI recruits partner agencies through a competitive selection process and matches projects with existing courses across the university’s curricula. Partner agencies are able to harness incredible momentum for their projects in large part because the partnership is realized on a bigger scale than more typical one-off university-community projects. Faculty are able to opt-in and augment their existing curriculum with real-world projects that have been identified, funded and supported by the leadership

and staff of the partner agency— ultimately delivering their students’ work for consideration and implementation. The RCI is a member of the Educational Partnerships for Innovation in Communities (EPIC) Network, a nationwide network of over 25 universities that have replicated the highly successful Sustainable City Year Model that was established at the University of Oregon in 2009. The model is based on university-community partnerships with a defined geographic and temporal scope, focused on advancing sustainability and the social good, leveraging the multidisciplinary knowledge and capacity of the university to ‘move the needle’ on pressing community issues. The RCI directly engages hundreds of CSU, Chico students each academic year, providing impactful opportunities for them to put theory to practice in their own community and region, connecting them with decision-makers in practitioners in their fields of study, and helping develop the next generation of workforce professionals and leaders.



Course Participants

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Department of Civil Engineering, College of Engineering, Computer Science & Construction Management, California State University, Chico

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Allison Downs	David Field	Jenna Delongchamp	Maria Ayala	Omar Alhaji
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Amber Conklin	Erica Plasencia-Campos	Jovanni Estrada	Mark Pemberton	Pedro Cortes Tinoco
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Benjamin Swaffar	Garrett Berna	Justin Riggs	Michelle Gonzalez	Robert Lim
Brandon Gentles	Gregory Cannon	Katelyn McNulty	Mirian Corona-Valdez	Roberto Ruiz Martinez
Bryan Salgado	Hannah Braun	Katherine MacKenzie	Mohommad Alhussein	Stephania Moreno
Chance McCreery	Isabelle Boettner	Kathryne Tetreault	Morgan Lane	Sulaiman Alsubaihi
Christopher Fisher	Ismael Morales	Kayla Thorne	Natali Van Leeuwen	Sydney Diede
Corey Umebayashi	Ivan Alcantar	Kyle Newkirk	Nawaf Alrashidi	Victor Vargas-Cuadras
Courtney Flores	Jackson Starke	Kylie Clark		William Alday



Public Works-Engineering

City of Chico, California

Staff



Resilient Cities Initiative
Institute for Sustainable Development
California State University, Chico

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RCI Executive Director

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RCI CAD Specialist
BS Civil Engineering Candidate

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Public Works-Engineering
City of Chico, California

Brendan Ottoboni
Director of Public Works-Engineering

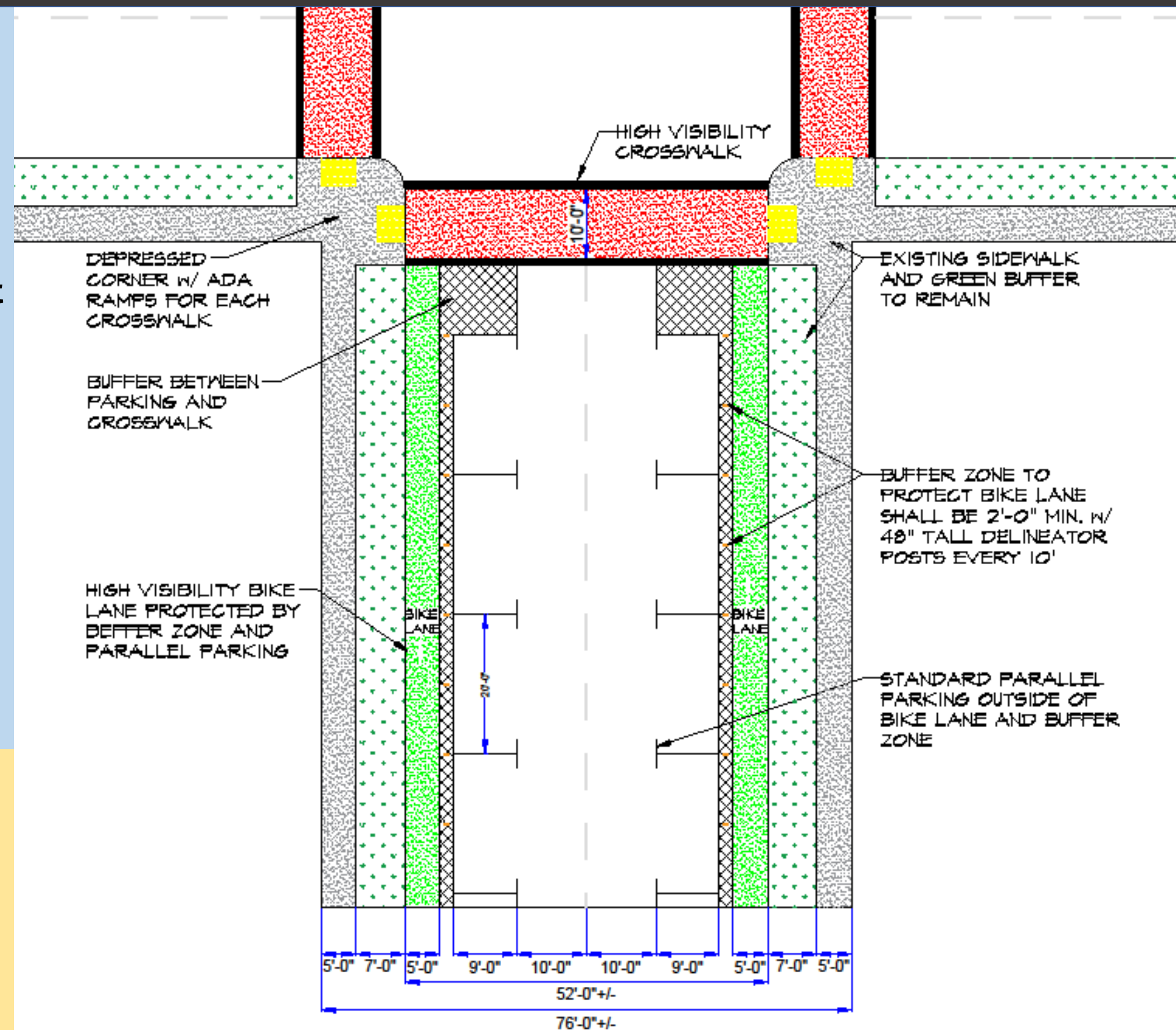
Chestnut Street Redesign Concept 1: Parking Protecting Bike Lane

Prepared by Mark Basil Pemberton, Jason T. Barnum

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Project Goals & Scope

- The South Campus Neighborhood Project (SCNP) is a coordinated effort by the city of Chico and the California State University of Chico to improve the Neighborhood that borders the South Campus
- The project spans from 2nd to 9th street and Salem to Orange Street
- The end goal of this project is to vastly improve all streets within the scope of the project in every way from lighting to creating a seamless complete street throughout the neighborhood
- This concept encompasses only Chestnut Street from 2nd to 9th Street



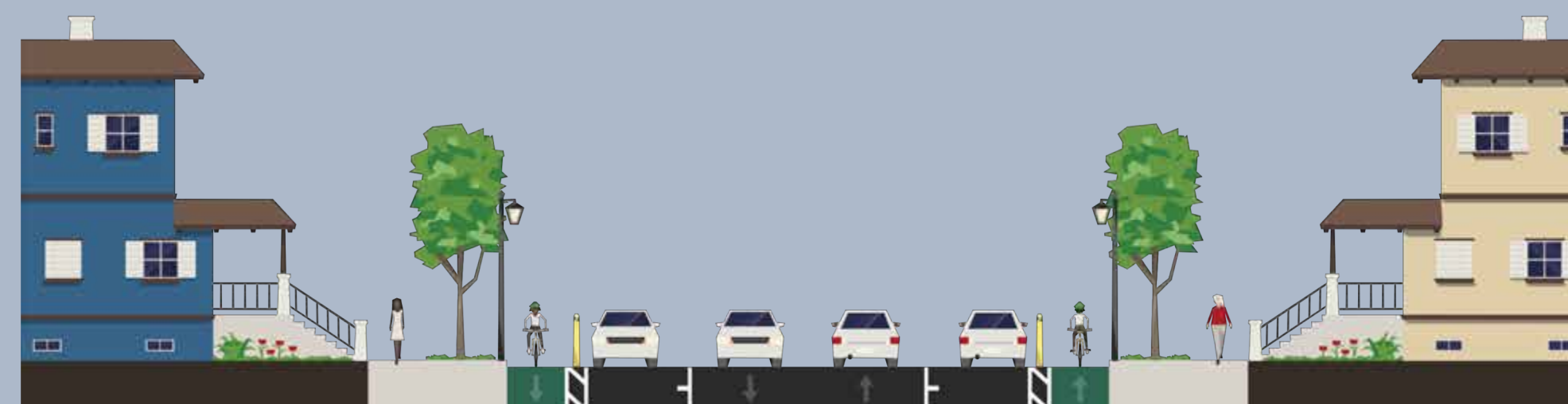
Benefits

- Bike lane is protected by parallel parking and small buffer zones with delineator posts creating a very safe feeling lane for bikers
- Cost is not significantly higher than simply repaving and repainting which is needed regardless of street layout changes
- Driving lanes are conventional creating very little confusion for those driving through neighborhood
- Switching of parking and bike lane is simple so as not to confuse those on the roadway

General Notes

- From 3rd and 2nd street, street widens to 55', therefore buffer zones next to bike lane shall widen by 1'-6" on each side
- 10' drive lane used for maximum safety of pedestrians and bikers
- Ramps that are ADA compliant as well as truncated dome strips should be used at every crosswalk
- Corner ramps may vary depending on intersection
- Entire street shall match the signage and lighting that is used on Ivy Street in the interest of having a consistent and safe neighborhood
- Buffer should include flexible delineator posts to help decrease confusion and give a slight extra barrier between cars and bikers

Total Street Layout w/ Signage Plans



Created in Streemix (<https://streetmix.net/>)

Problems and Possible Solutions

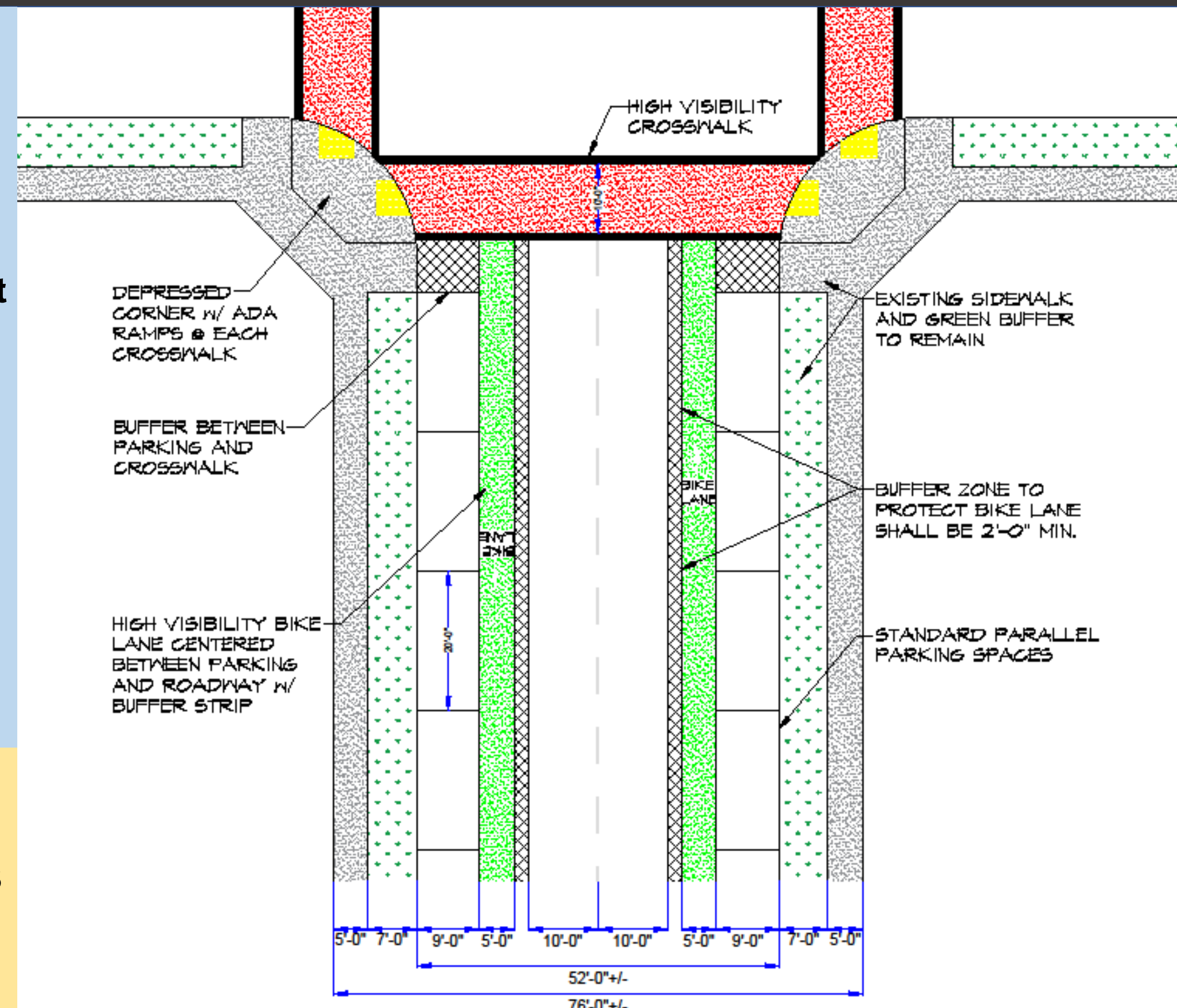
- Problem: Drivers may be confused with parking in what does seem to be the middle of the street
- Solution: The buffer zones and delineator posts as well as the use of signs at the beginning of the areas with this street layout will help clear up the confusion of drivers that are parking along the street
- Problem: People going to and from their cars from parking spots have to cross the bike lane
- Solution: Buffer zone gives an area for drivers to have clear vision of the bike lane and can wait until clear to cross safely

Project Goals & Scope

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- This concept encompasses only Chestnut Street from 2nd to 9th Street

General Notes

- From 3rd and 2nd street, street widens to 55', therefore buffer zones next to bike lane shall widen by 1'-6" on each side
- 10' drive lane used for maximum safety of pedestrians and bikers
- Ramps that are ADA compliant as well as truncated dome strips should be used at every crosswalk
- Corner ramps may vary depending on intersection
- Entire street shall match the signage and lighting that is used on Ivy Street in the interest of having a consistent and safe neighborhood
- Buffer zone can not use any delineator post because of parallel parking spots



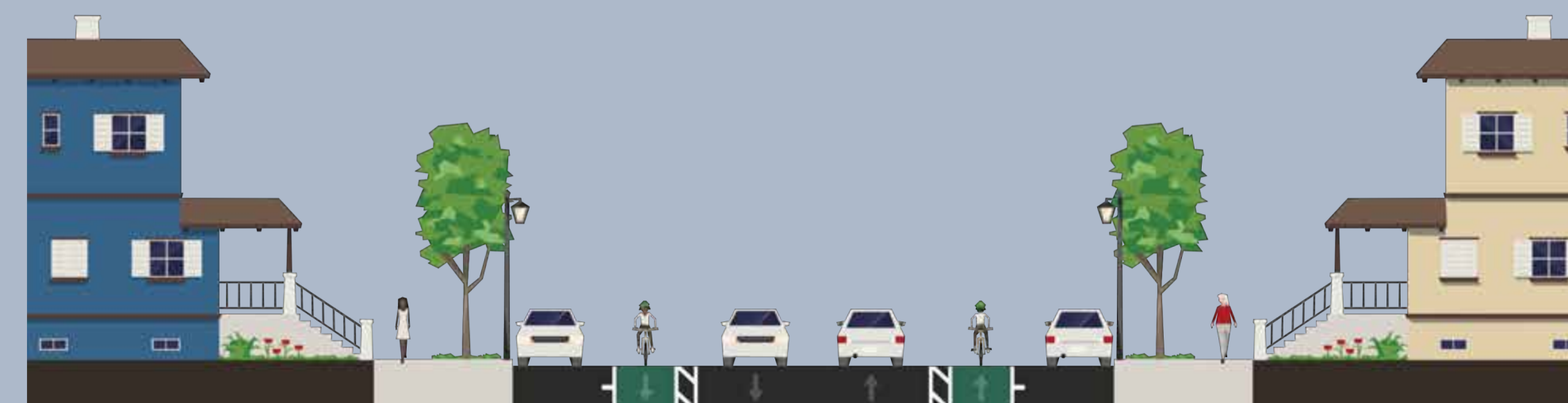
Benefits

- Bike lane is protected by small buffer zones creating a safer feeling lane for bikers
- Cost is not significantly higher than simply repaving and repainting which is needed regardless of street layout changes
- Conventional driving lanes and parking will create little to no confusion for drivers and bikers alike
- Switching from this layout back to conventional lanes at 2nd and 9th street is very simple

Problems and Possible Solutions

- Problem: Confusion of drivers with having to drive over bike lane and buffer to park
- Solution: The current parking situation is very similar to this and drivers only need to drive over lines
- Problem: Not a whole lot safer than current situation
- Solution: The small change of adding buffer lanes and painted bike lanes gives bikers a feeling of safety without causing too much change to the current road layout

Total Street Layout w/ Signage Plans



Created in Streemix (<https://streetmix.net/>)

Chestnut Street Redesign Concept 3: Centered Bike Lane

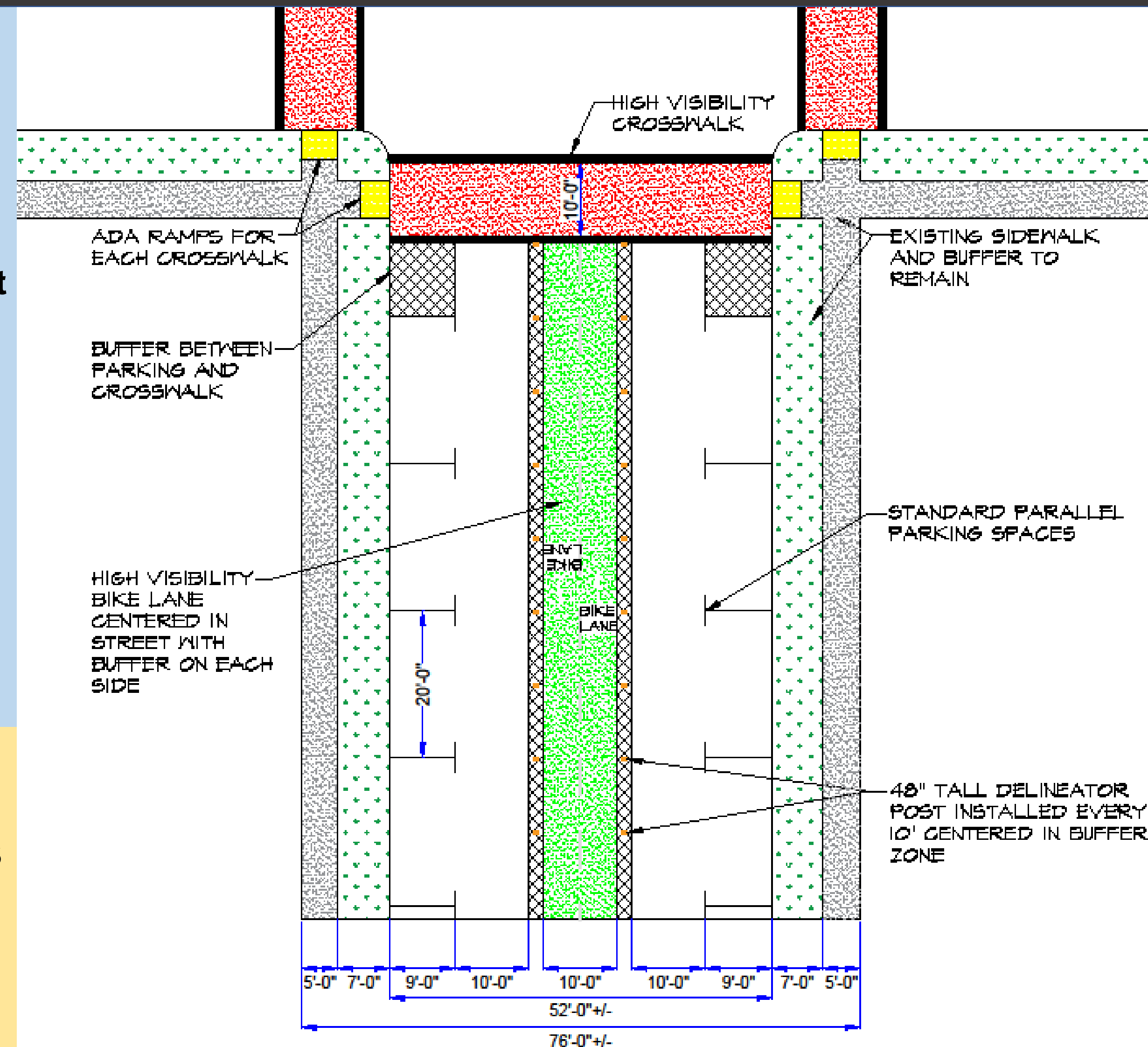
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- This concept encompasses only Chestnut Street from 2nd to 9th Street

General Notes

- From 3rd and 2nd street, street widens to 55', therefore buffer zones next to bike lane shall widen by 1'-6" on each side
- 10' drive lane used for maximum safety of pedestrians and bikers
- Ramps that are ADA compliant as well as truncated dome strips should be used at every crosswalk
- Corner ramps may vary depending on intersection
- Entire street shall match the signage and lighting that is used on Ivy Street in the interest of having a consistent and safe neighborhood
- Buffer should include flexible delineator posts to help decrease confusion and give a slight extra barrier between cars and bikers



Benefits

- Parking is conventional and easy to understand
- Bike lane is protected by buffer zones and delineator posts from drivers and from those pulling out of parking spots or going around corners
- Cost is not significantly higher than simply repaving and repainting

Problems and Possible Solutions

- Problem: Driver and biker confusion at entrance to bike lanes and when bike lanes change to conventional lanes
- Solution: Include lots of signage in the problem areas stated above to reduce the confusion of the drivers and bikers
- Problem: Turning into or out of parking lots
- Solution: Strategic buffer lanes along with signage at entrances or exits to parking lots. At these buffer lanes delineator posts would stop and signs would be placed to warn both bikers and drivers that cars would be entering the bike lane to turn into or out of parking lots

Section View of Street Concept



Created in Streemix (<https://streetmix.net/>)

Ivy Street Redesign Concept 1: Parking Protecting Bike Lane

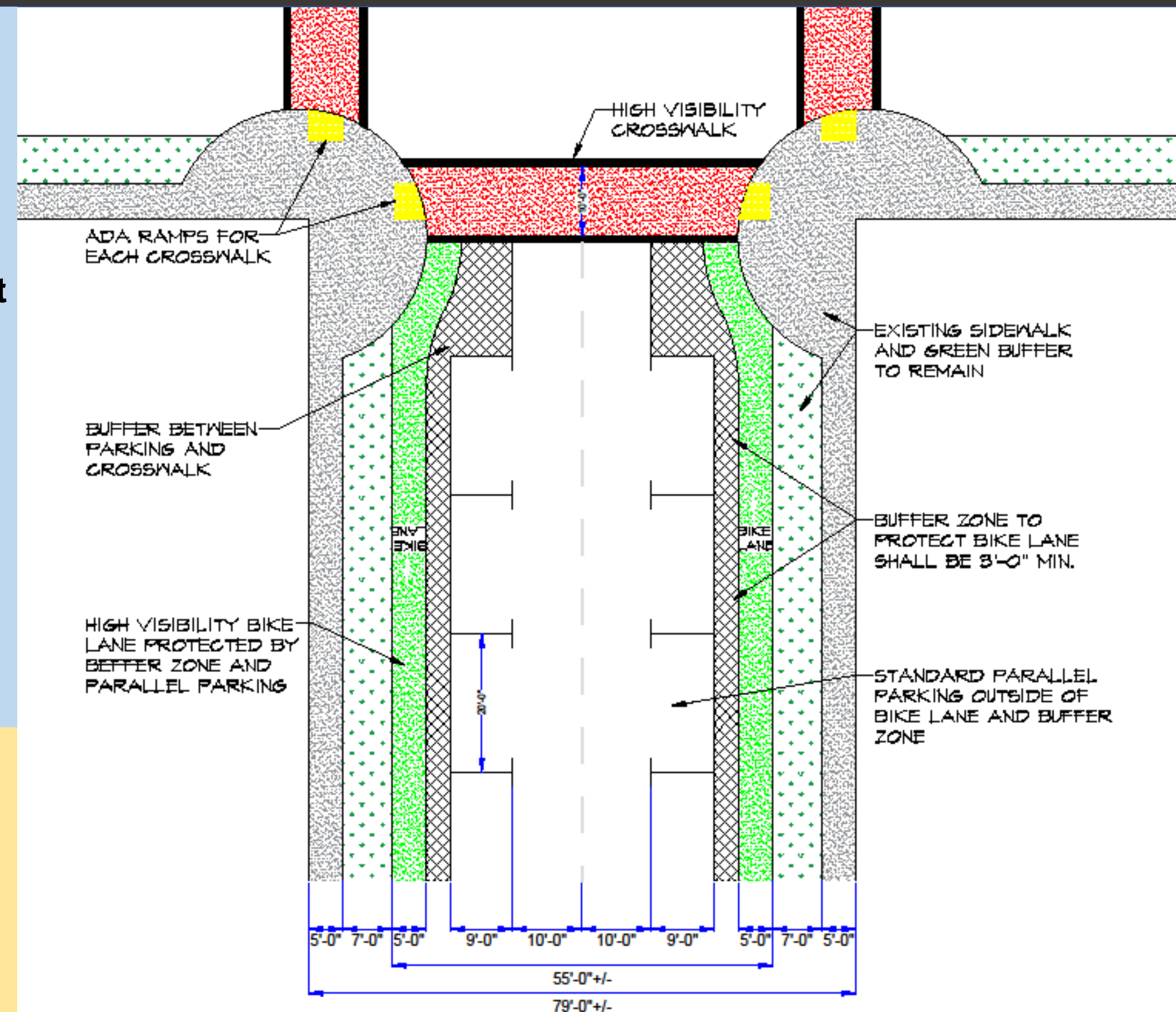
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- This concept encompasses only Ivy Street from 2nd to 9th Street

General Notes

- Total road width stays consistent from 2nd to 9th street while on Ivy Street
- 10' drive lane used for maximum safety of pedestrians and bikers
- Ramps that are ADA compliant as well as truncated dome strips should be used at every crosswalk
- Corner ramps may vary depending on intersection
- Street signage and lighting shall remain as Ivy is the safest street in terms of intersections and should be used as the model for the neighborhood to create a feeling of consistency and safety throughout
- Buffer should include flexible delineator posts to help decrease confusion and give a slight extra barrier between cars and bikers



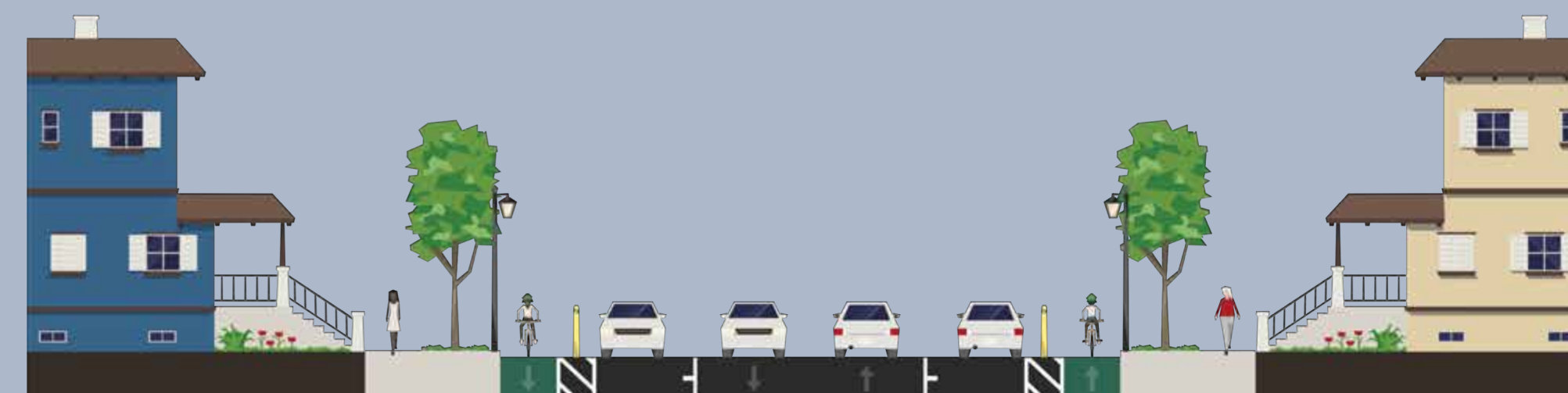
Benefits

- Bike lane is protected by parallel parking and small buffer zones with delineator posts creating a very safe feeling lane for bikers
- Cost is not significantly higher than simply repaving and repainting which is needed regardless of street layout changes
- Driving lanes are conventional creating very little confusion for those driving through neighborhood
- Switching of parking and bike lane is simple so as not to confuse those on the roadway

Problems and Possible Solutions

- Problem: Drivers may be confused with parking in what does seem to be the middle of the street
- Solution: The buffer zones and delineator posts as well as the use of signs at the beginning of the areas with this street layout will help clear up the confusion of drivers that are parking along the street
- Problem: People going to and from their cars from parking spots have to cross the bike lane
- Solution: Buffer zone gives an area for drivers to have clear vision of the bike lane and can wait until clear to cross safely

Total Street Layout w/ Signage Plans



Created in Streemix (<https://streetmix.net/>)

Ivy Street Redesign Concept 2: Buffer Zone Protecting Bike Lane

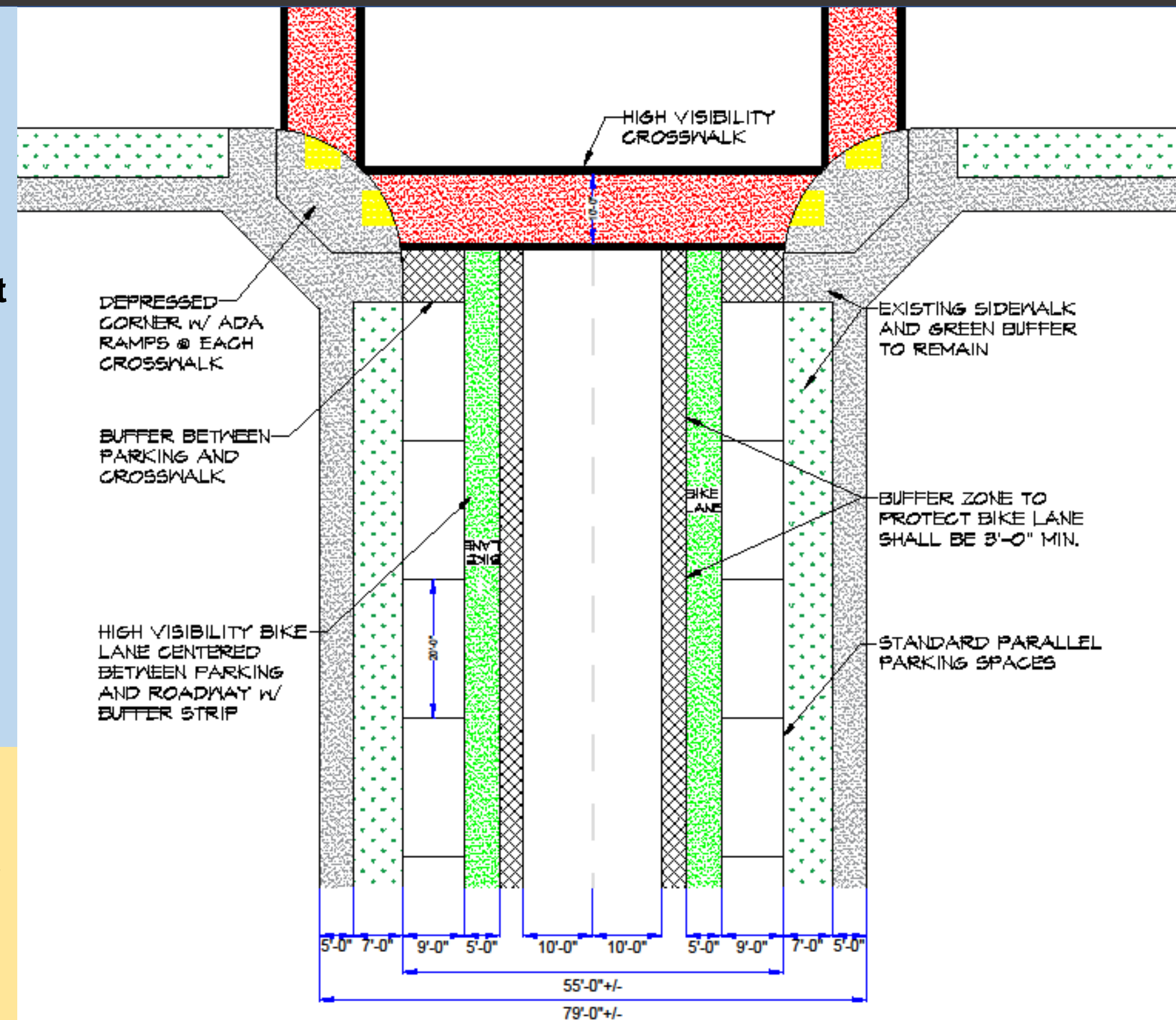
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- Buffer zone can not use any delineator post because of parallel parking spots



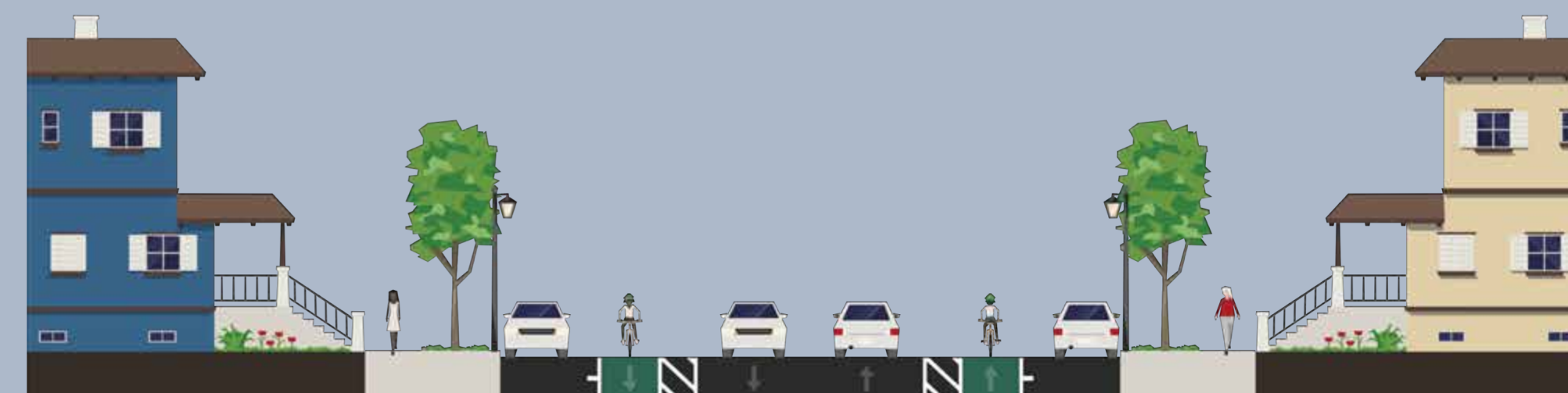
Benefits

- Bike lane is protected by small buffer zones creating a safer feeling lane for bikers
- Cost is not significantly higher than simply repaving and repainting which is needed regardless of street layout changes
- Conventional driving lanes and parking will create little to no confusion for drivers and bikers alike
- Switching from this layout back to conventional lanes at 2nd and 9th street is very simple

Problems and Possible Solutions

- Problem: Confusion of drivers with having to drive over bike lane and buffer to park
- Solution: The current parking situation is very similar to this and drivers only need to drive over lines
- Problem: Not a whole lot safer than current situation
- Solution: The small change of adding buffer lanes and painted bike lanes gives bikers a feeling of safety without causing too much change to the current road layout

Total Street Layout w/ Signage Plans



Created in Streemix (<https://streetmix.net/>)

Ivy Street Redesign Concept 3: Protected Bike Lane with Diagonal Parking

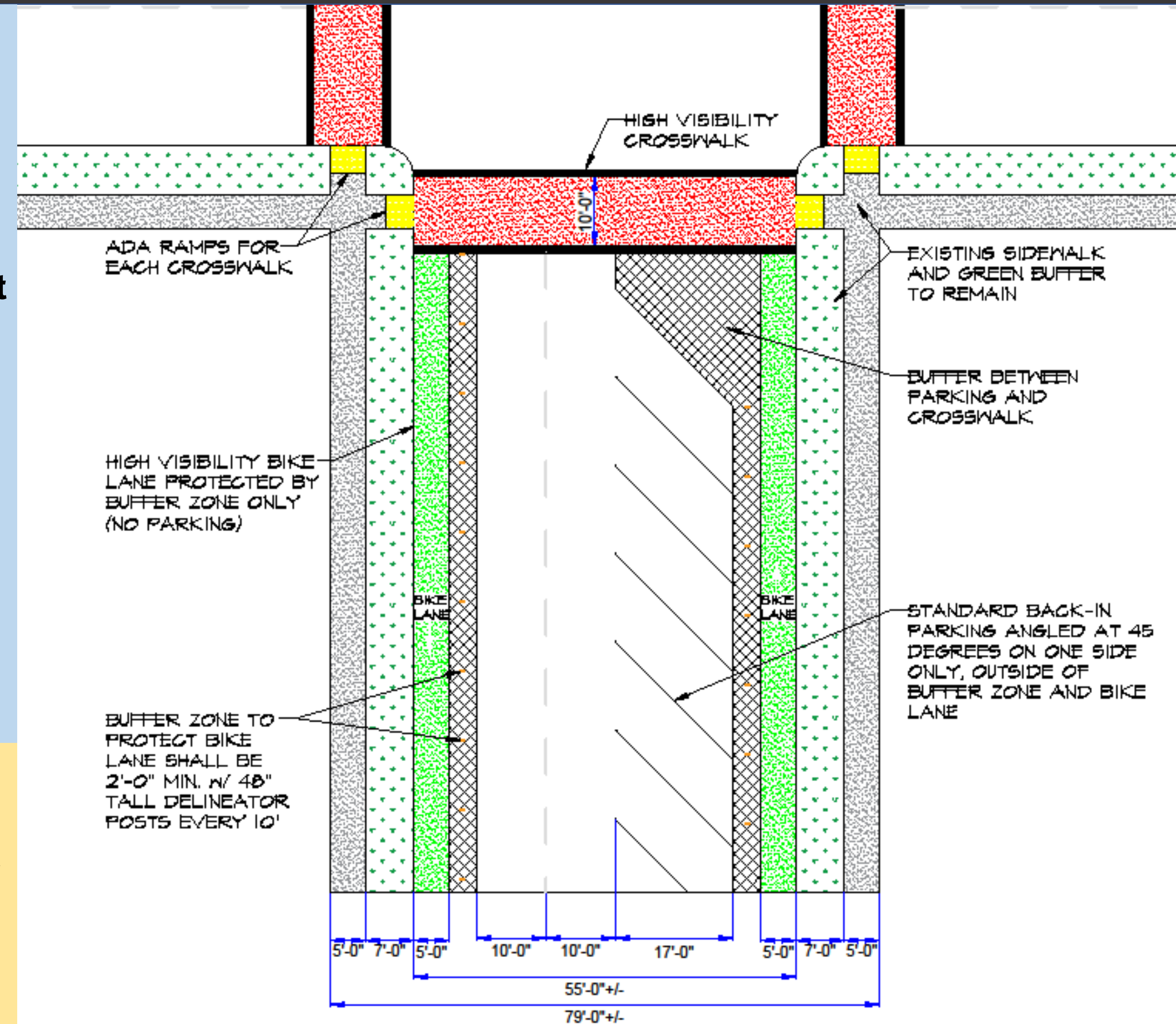
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Project Goals & Scope

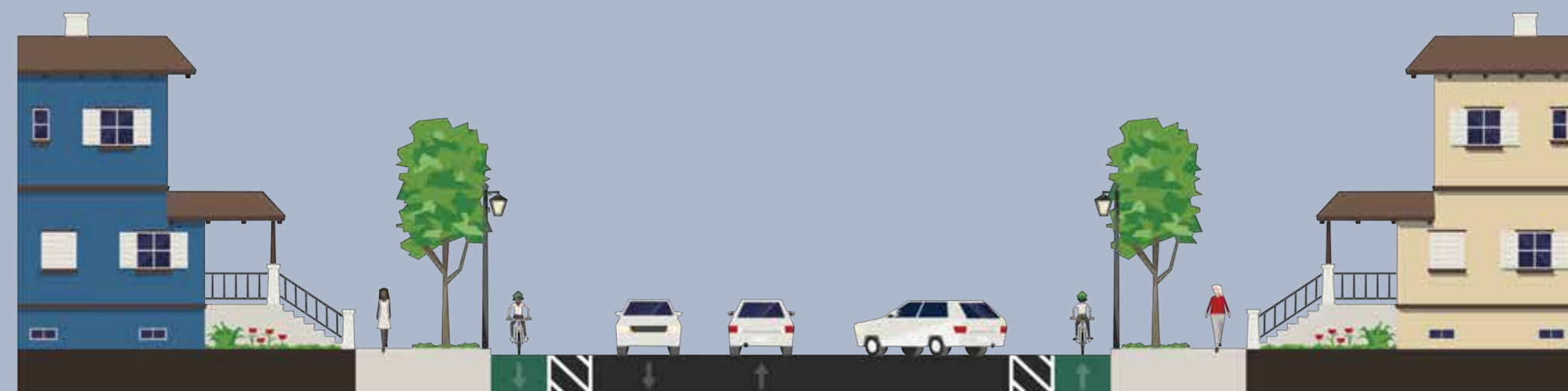
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- Buffer should include flexible delineator posts to help decrease confusion and give a slight extra barrier between cars and bikers



Total Street Layout w/ Signage Plans



Created in Stroomix (<https://streetmix.net/>)

Benefits

- Bike lane is protected by small buffer zones and/or parking which creates a safer feeling lane for bikers
- Cost is not significantly higher than simply repainting and repaving which is needed regardless of street layout changes
- Back in diagonal parking is considered the safest option for pulling back onto road

Problems and Possible Solutions

- Problem: Less overall parking
- Solution: The 25% loss in parking is a small tradeoff for safer feeling streets
- Problem: Drivers may be confused with parking in what does seem to be the middle of the street
- Solution: The buffer zones and delineator posts as well as the use of signs at the beginning of the areas with this street layout will help clear up the confusion of drivers that are parking along the street
- Problem: People going to and from their cars from parking spots have to cross the bike lane
- Solution: Buffer zone gives an area for drivers to have clear vision of the bike lane and can wait until clear to cross safely
- Problem: Driver and biker when bike lanes change to conventional lanes at 2nd and 9th street
- Solution: Include lots of signage at 2nd and 9th street intersections to reduce the confusion of the drivers and bikers



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