



GREEN CONNECTIONS: DESIGN PRINCIPLES + DESIGN TOOLKIT

MORE

The design of Green Connections will be context-specific, wedding the multiple project goals to inspire unique design solutions that build on existing streetscape design elements.

Green Connections project goals expand on the following urban systems:

- Public Health: Increase active transportation to parks
- Sustainability: Enhance urban ecology
- Livability: Support neighborhood stewardship and placemaking

In many instances, individual design solutions can address multiple project goals. For example, traffic-calming measures like curb extensions, medians or traffic circles may also provide opportunities for habitat creation, bio-retention planters (rain gardens) and/or programming opportunities.

In some instances limited space in the right-of-way or unique characteristics of the project site may necessitate a design that prioritizes only some of the goals, and particular characteristics of a street will inform the articulation of the Green Connections network, for instance streets along the bike network should account for cyclists' needs in the design whereas segments on steep slopes, such as portions of the Ridge Trail near Mt. Sutro should focus on pedestrian comfort.

Project Goals

Principles for Designing Green Connections

Green Connections Program Components

Public Health Increase active transportation to parks



Prioritize walking and biking.



Calm traffic to support active transportation for all users.



Focus on conflict points.



Celebrate park edges to facilitate access to parks and open spaces.

WALKING



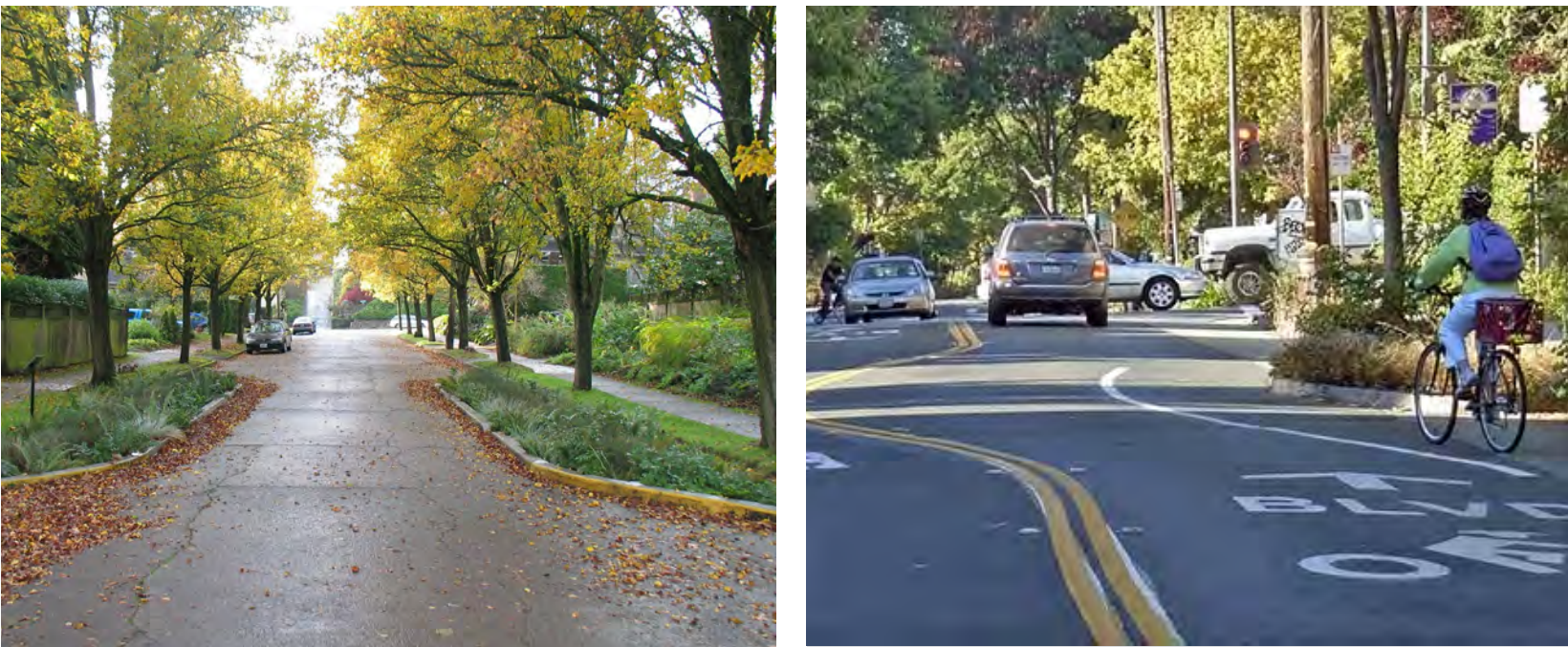
Traffic calming, seating and plantings all contribute to a pleasant walking environment.

BIKING



Green Connections should be comfortable streets to bike on for people of all ages and abilities.

TRAFFIC CALMING



Green Connections introduces several new traffic calming devices to slow traffic and improve safety for pedestrians and people riding bikes in San Francisco.

Sustainability Enhance urban ecology



Emphasize greening and street trees.



Cultivate ecoliteracy among San Franciscans.



Incorporate target species and target habitat.



Understand target species' lifecycle.



Create habitat structure.



Consider habitat patch scale and density.



Avoid habitat sinks.



Include green infrastructure to manage stormwater.



Increase planted areas in the ROW.



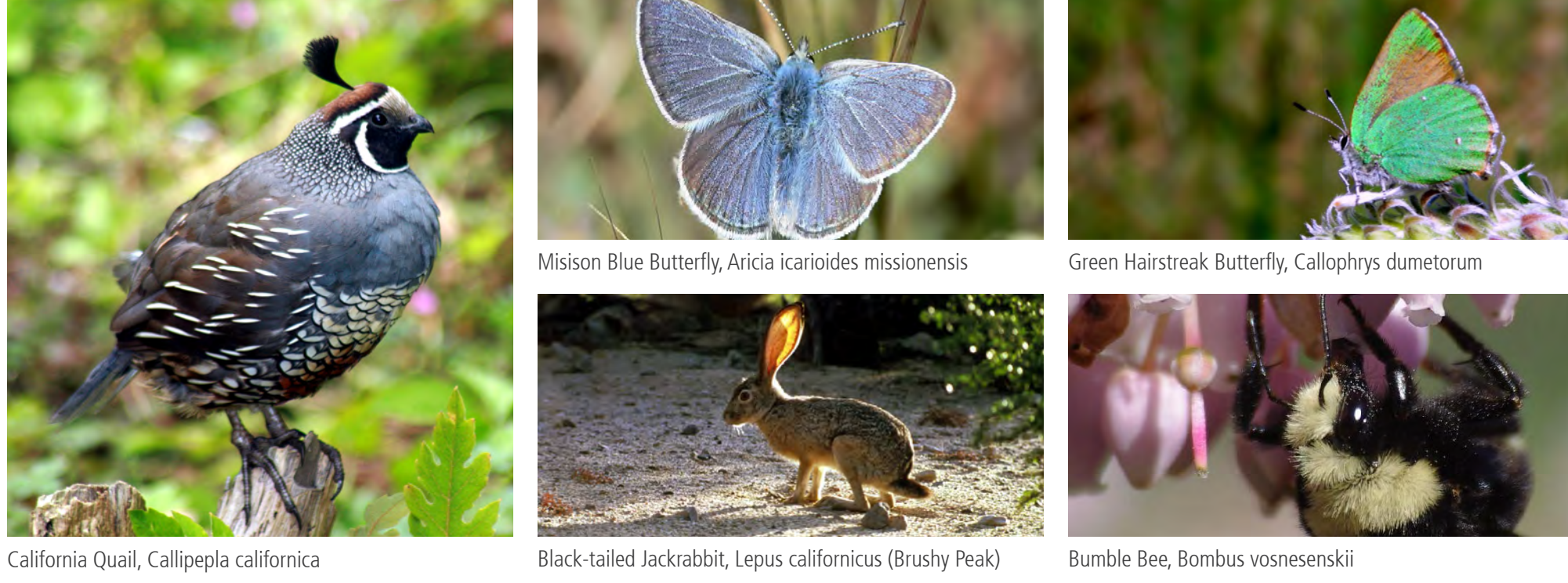
Design for site hydrology.

STORMWATER RUN-OFF



Stormwater infrastructure like bio-retention gardens (rain gardens) can help beautify the streetscape while reducing stormwater runoff.

WILDLIFE HABITAT



California Quail, *Callipepla californica*

Mission Blue Butterfly, *Artica karlides missionensis*

Green Hairstreak Butterfly, *Callophrys dumetorum*

Black-tailed Jackrabbit, *Lepus californicus* (Brushy Peak)

Bumble Bee, *Bombus vosnesenskii*

SAN FRANCISCO PLANT DATABASE

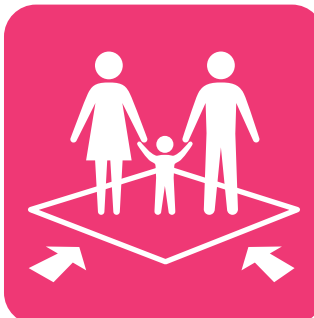


The Green Connections plant database acts as a resource for gardeners, designers, ecologists and community members. It significantly increases the number of plant species that can be planted in the public right-of-way.

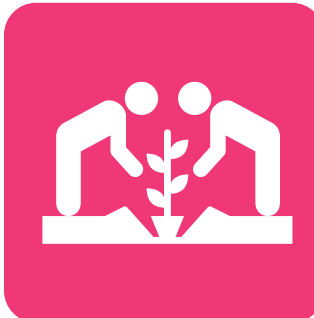
Livability Support neighborhood stewardship and placemaking



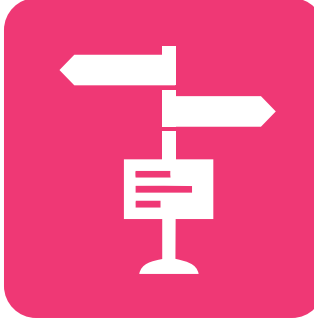
Engage communities in design and stewardship



Design for community gathering spaces



Program spaces to encourage stewardship and placemaking



Create wayfinding and signage:

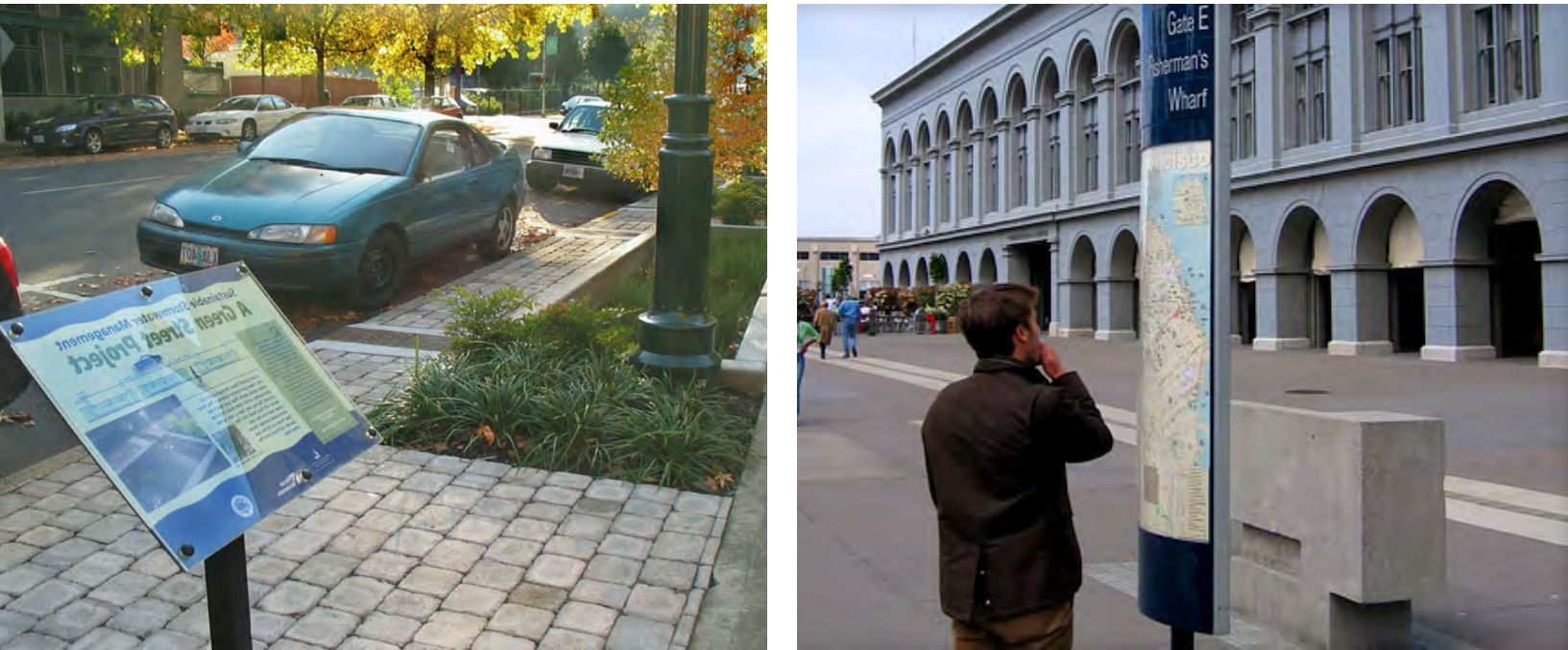
1. Strive for simplicity
2. Integrate with other wayfinding systems
3. Scale signage for active transportation users
4. Develop a multi-tiered approach
5. Express wayfinding through materiality

PROGRAMMING ELEMENTS



Programming elements like seating areas and community garden spaces can help create a sense of place and encourage community members to steward their neighborhood streets.

SIGNAGE AND WAYFINDING



Signage along the Green Connections network will improve the network's legibility for users and facilitate mobility throughout the City. Signage can also educate the public about local ecology history and culture.

ART



Works of art like the "Bird Hotel" and clean-up mural shown above can create habitat and educate the public about the City's ecology.

Design Toolkit

The Green Connections Design Toolkit is a resource for community members, city agencies and designers when developing and implementing Green Connections routes. The Toolkit includes 20 intersection and block elements, to give communities a broad range of options for creating Green Connections routes in their neighborhoods. Toolkit elements include information that can inform a conversation about potential tradeoffs and benefits of different types of street improvements.

The Toolkit is not intended to be prescriptive: there may be situations where more than one element is appropriate for a given location. Similarly, there may be situations where design solutions not anticipated in the Design Toolkit are appropriate, and project designers are encouraged to use their judgment and creativity to design an intervention that best matches the site constraints and opportunities.

Each element in the Design Toolkit is presented with:

- A short description of the element and how it functions
- One or more illustrative graphic
- Location criteria describing what street types are appropriate for this element
- Design guidelines
- A chart and discussion of how the element performs in relation to Green Connections project goals

INTERSECTION ELEMENTS

TREATMENT NAME	NEW TO SF
HAWK (High-intensity Activated Crosswalks)	No
Bicycle Signals	No
Rapid Rectangular Flashing Beacons (RRFB)	NA
Intersection Murals	Yes
4 Standard Bulb-outs with stops for cross traffic	No
Traffic Circles	No
Partial Diverters	Yes
Intersection Islands	Yes
Diagonal Diverters	Yes
Block-end Plazas	Yes

BLOCK ELEMENTS

TREATMENT NAME	NEW TO SF
Parking Lane Planters	No
Chicanes	No
Chicane with Sidewalk Widening	No
Chicane with Back-in angled parking (1-way)	No
Neck Downs	Yes
Landscaped Center Medians	No
Wide Sidewalk Gardens	No
Play Streets	Yes
Back-in Angled Parking	No

DIAGONAL DIVERTER

SITEPLAN



Sample Toolkit Element

GUIDELINES

Incorporating large canopy trees into the design of diagonal diverters is strongly encouraged as it can create a visual focal point and sense of enclosure for the surrounding streetscape. Tree Planting must comply with DPW Director's Order 169,946.

Diagonal diverters should be designed to maximize opportunities for greening, stormwater management and habitat creation.

Consider incorporating programming elements like seating nooks, sculptural elements and informational or educational signage.

Consider including a pedestrian pathway diagonally across the intersection, along the diagonal diverter.

The design of diagonal diverters should seek to maximize the amount of space repurposed

from vehicular circulation for enhanced greenery and community gathering spaces.

Diagonal Diverters should include an emergency vehicle pathway through the center of the diverter, which can also serve as the bicycle path of travel through the diverter. The pathway should be designed to discourage non-emergency vehicles from crossing the intersection. This can be achieved with a metal bar that is low enough for emergency vehicles to drive over but tall enough that a conventional car can't clear it, or with a safe hit post that could be driven over by any vehicle but serves as a strong visual cue that this is not a through-way. Another strategy is to create a narrow path using asphalt (6-8') that is lined on each side with textured pavers like cobble stones, designed to withstand the weight of an emergency vehicle.

This treatment would not be appropriate on any Muni route.

BAR CHART

ACTIVE TRANSPORTATION

Support Pedestrians	●●●●●
Support Bikes	●●●●○
Calm Traffic	●●●●○

URBAN ECOLOGY

Manage Stormwater	●●●●○
Enhance Habit	●●●○●

NEIGHBORHOOD STEWARDSHIP AND PLACEMAKING

Potential Increase in Usable Public Space	●●●●○
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ABILITY TO IMPLEMENT

Cost Effective (Low cost scores highly)	●●●○●
Ease of Maintenance	●●○●●

TRAFFIC AND PARKING CONSIDERATIONS

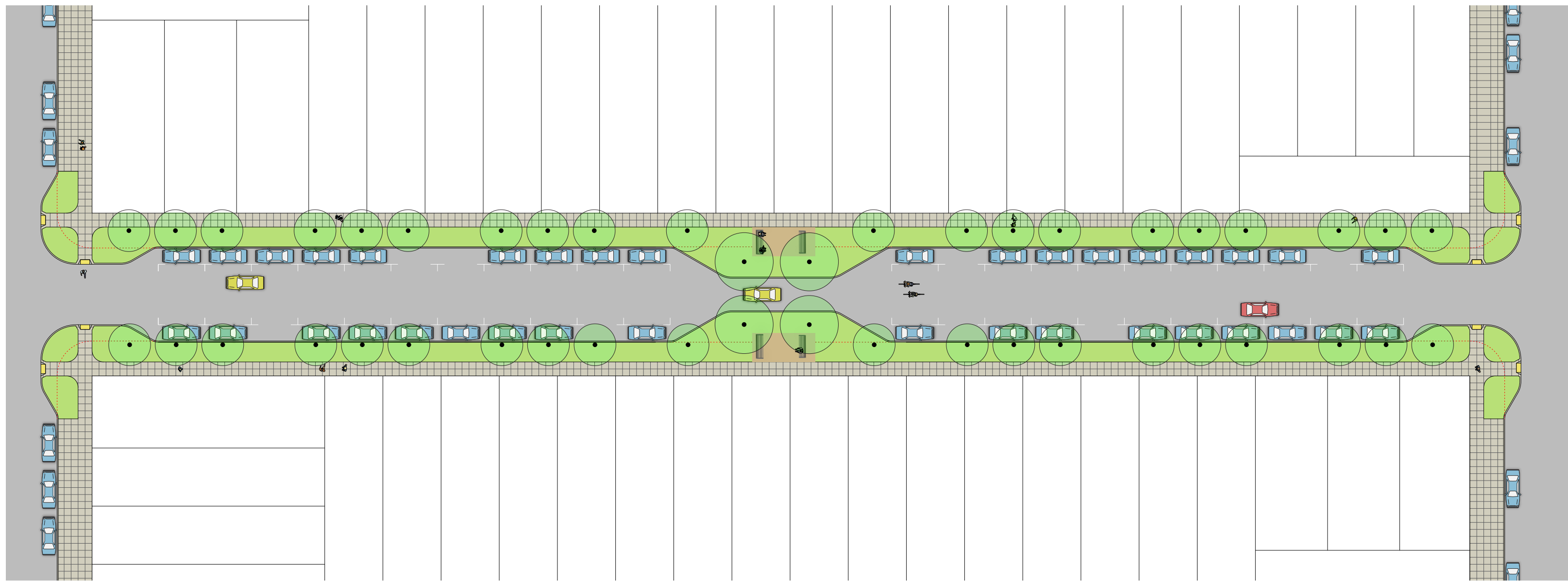
Potential Parking Loss at Intersection	
Restricts Some Auto Access	

PRECEDENTS

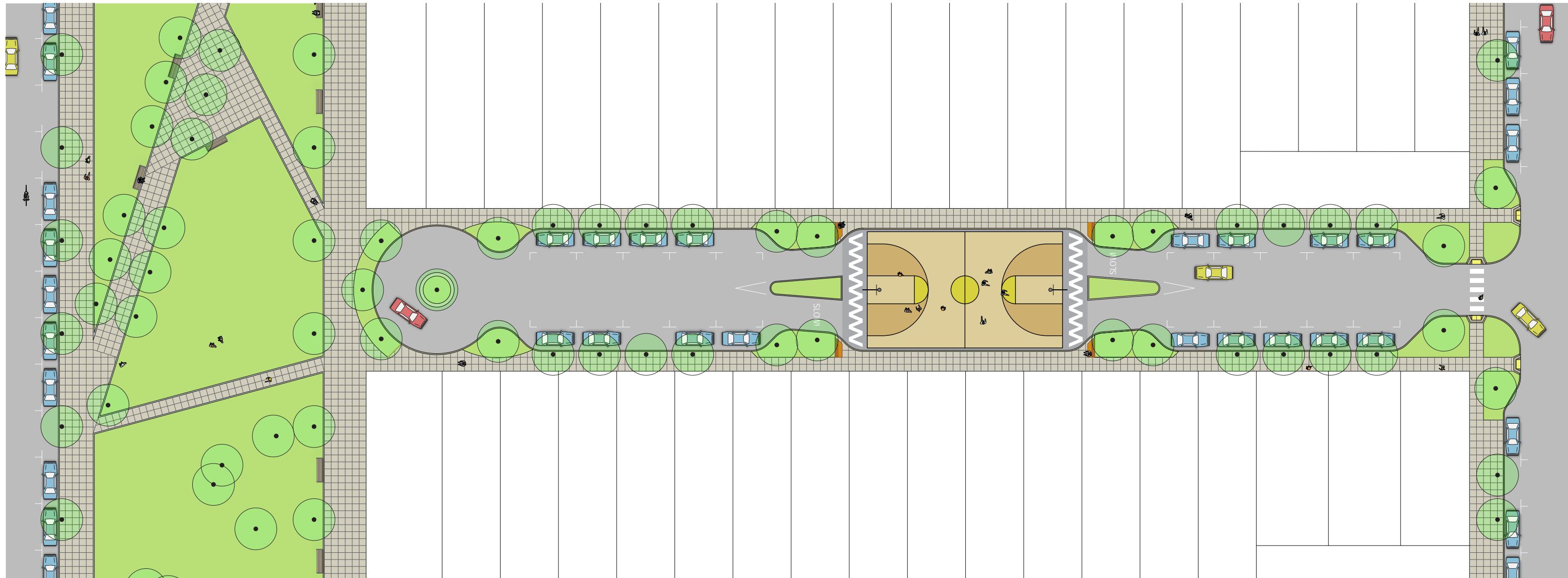


Toolkit Elementns New to SF

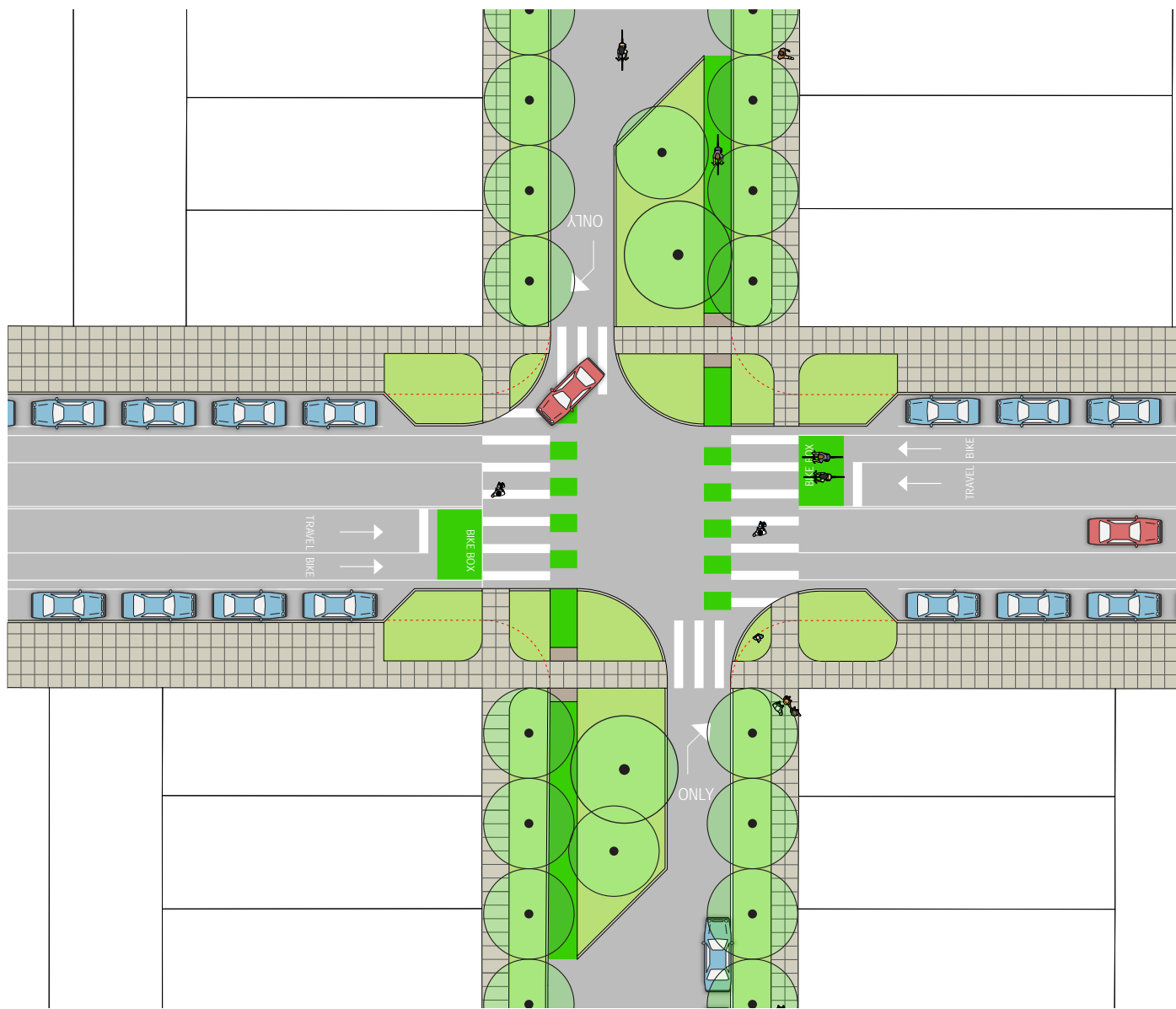
NECK DOWN



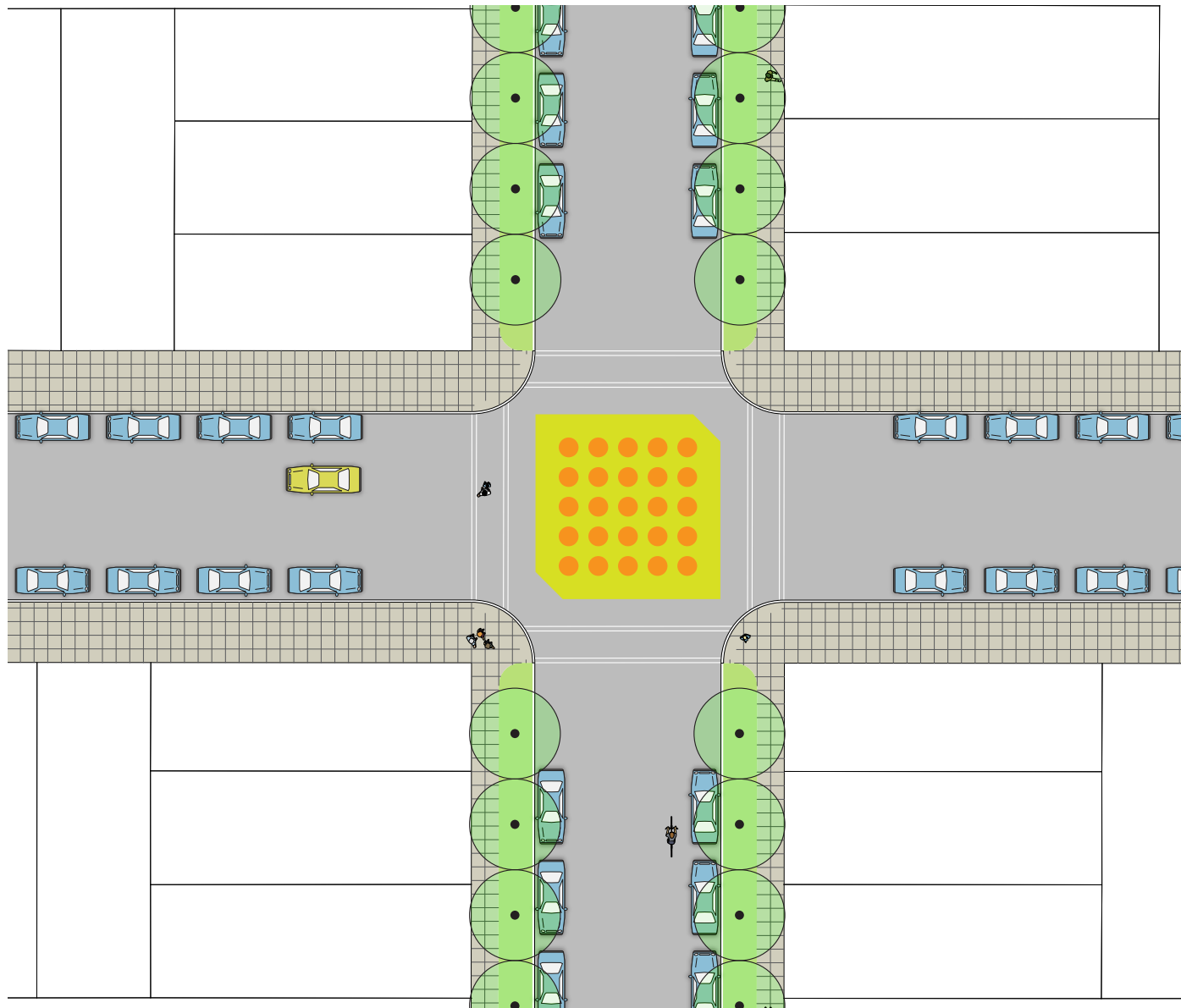
PLAY STREET



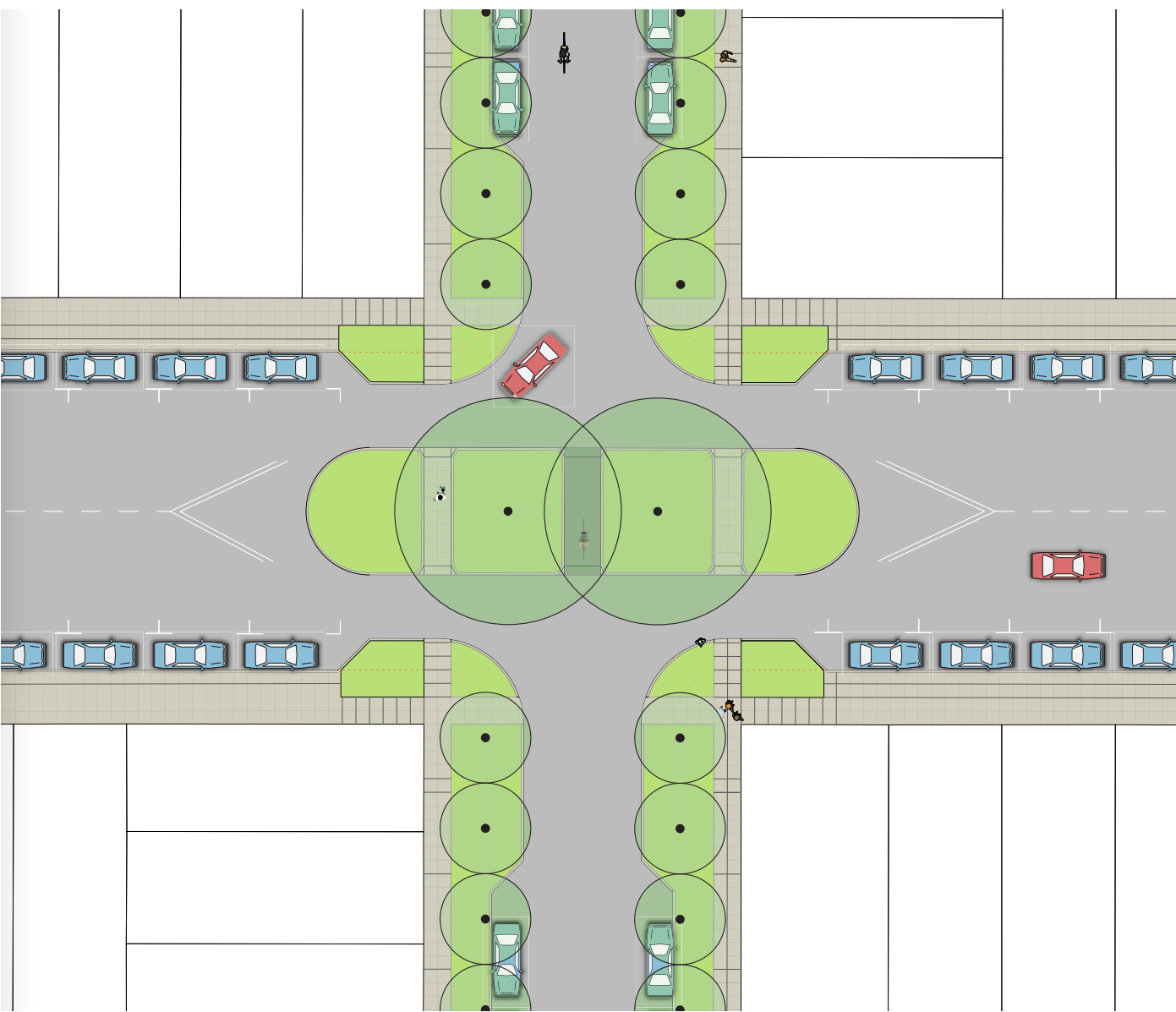
PARTIAL DIVERTER (HIGH VOLUME)



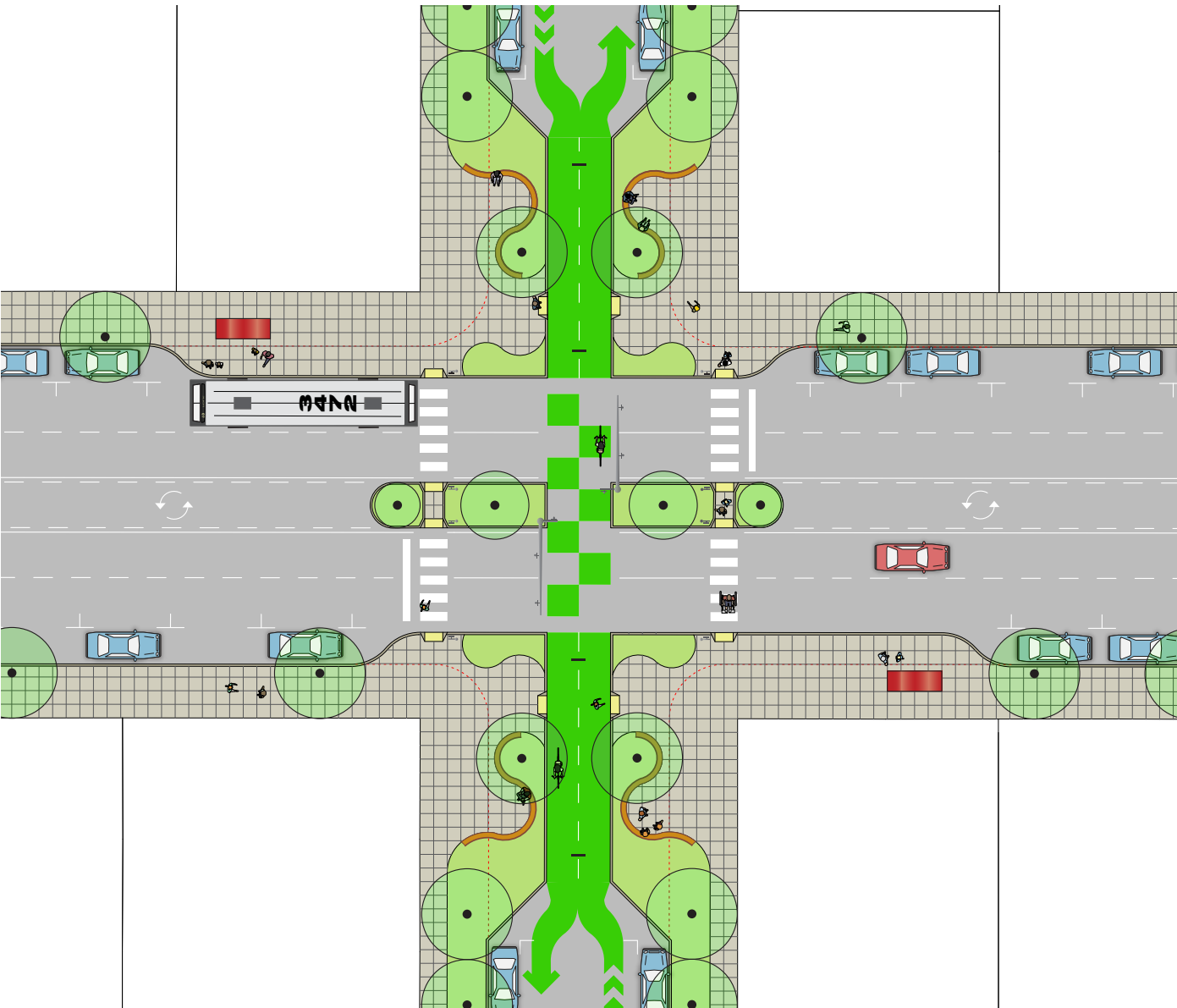
INTERSECTION MURAL



INTERSECTION ISLAND



BLOCK-END PLAZA





DESIGNING GREEN CONNECTIONS: PLANT DATABASE

The development of a citywide plant list was one component of the Green Connections project. We started by compiling existing City lists of recommended street trees and plants.

The plant database will be a resource for gardeners, designers, ecologists and community members. It provides planting recommendations for the public right-of-way and private backyards. For each plant, there will be helpful information including bloomtime, attractive features, size at maturity, site conditions, soil type, water needs, pruning needs, and information about habitat value and associated wildlife.

The content builds on existing city guidance on greening and landscaping and also offers route-specific information for greening along the Green Connections network.

The plant database was compiled using the following references and resources:

- Calflora.org
- “A Flora of San Francisco, 1958” by John Thomas Howell
- Horticultural consultation from botanists Gail Weschle and Jake Sigg of the California Native Plant Society
- San Francisco Department of the Environment, Peter Brastow, Biodiversity Coordinator
- “Recommended Street Tree Species List” by San Francisco Urban Forestry Council
- “San Francisco Sidewalk Landscaping: Recommended Tree List” by San Francisco Department of Public Works
- “San Francisco Sidewalk Landscaping: Recommended Drought Tolerant Plant List” by San Francisco Department of Public Works
- “San Francisco Stormwater Design Guidelines, Appendix D: Vegetation Palette” by San Francisco Public Utilities Commission

NOTE
These are conceptual designs of the plant database
The final user interface, site name, and site URL are subject to change

