



City of Oakland Neighborhood Bike Route Implementation Guide



Introduction

This Guide provides direction on implementing the City of Oakland’s Bike Plan (2019) recommendations for “neighborhood bike routes” (NBRs) also known as “bicycle boulevards.” The Bike Plan proposes over 75 centerline miles of NBRs (see Figure 1, Neighborhood Bike Route Map, next page) which are defined as:

- Calm local streets where bicyclists have priority but share roadway space with automobiles.
- Include shared roadway bicycle markings on pavement and additional traffic calming measures like speed humps or traffic diverters to keep streets comfortable for bicyclists.
- Comfortable for bicyclists with wider range of comfort levels.

The Bike Plan outlines four actions for streets to be designated as NBRs:

1. Improving Major Street Crossings;
2. Reducing or Preventing Speeding;
3. Preventing High Car Volumes; and
4. Increasing Pavement Quality.

This Guide describes implementation in the following five subject areas: Scoping & Monitoring, Route Establishment, Traffic Calming, Traffic Control, and Public Notification & Comment.



Some of the proposed NBRs in the Bike Plan are beyond the scope of this document. These include streets with significant AC Transit service and streets that are designated as thoroughfares for motor vehicles (i.e., arterials and collectors). Some collectors are residential streets with modest traffic volumes, and this guide is intended for these streets. However, other collectors and arterials have significantly higher traffic volumes and provide key connections in the street network. This guide does not provide all of the resources necessary for determining the feasibility and desirability of these more ambitious proposals. For a preliminary assessment of all NBRs, see the screening analysis at <https://tinyurl.com/OaklandNBR> and accompanying map at <https://arcg.is/OLXmbK>.

1. Scoping & Monitoring

To evaluate the level of traffic calming required, average daily traffic counts, speeds, and five-year crash data should be consulted. (Note: If 311 data is found to be accessible and helpful, this should be included as well.) If access restrictions or stop sign modifications are proposed, other data will be required (see Sections 2 and 3).

OakDOT sets target traffic speeds and volumes for NBRs based on NACTO’s Contextual Guidance for Selecting All Ages and Abilities Bikeways, March 2014¹ as follows:

- Speeds less than or equal to 20 mph (95th percentile), less than or equal to 2,000 average vehicles per day, and less than 50 vehicles per hour per direction at peak hour; or
- Speeds less than or equal to 25 mph (95th percentile), less than or equal to 1,500 average vehicles per day, and less than 50 vehicles per hour per direction at peak hour.

¹ nacto.org/publication/urban-bikeway-design-guide/designing-ages-abilities-new/choosing-ages-abilities-bicycle-facility

Oakland Bikeway Network: Existing & Proposed Neighborhood Bike Routes

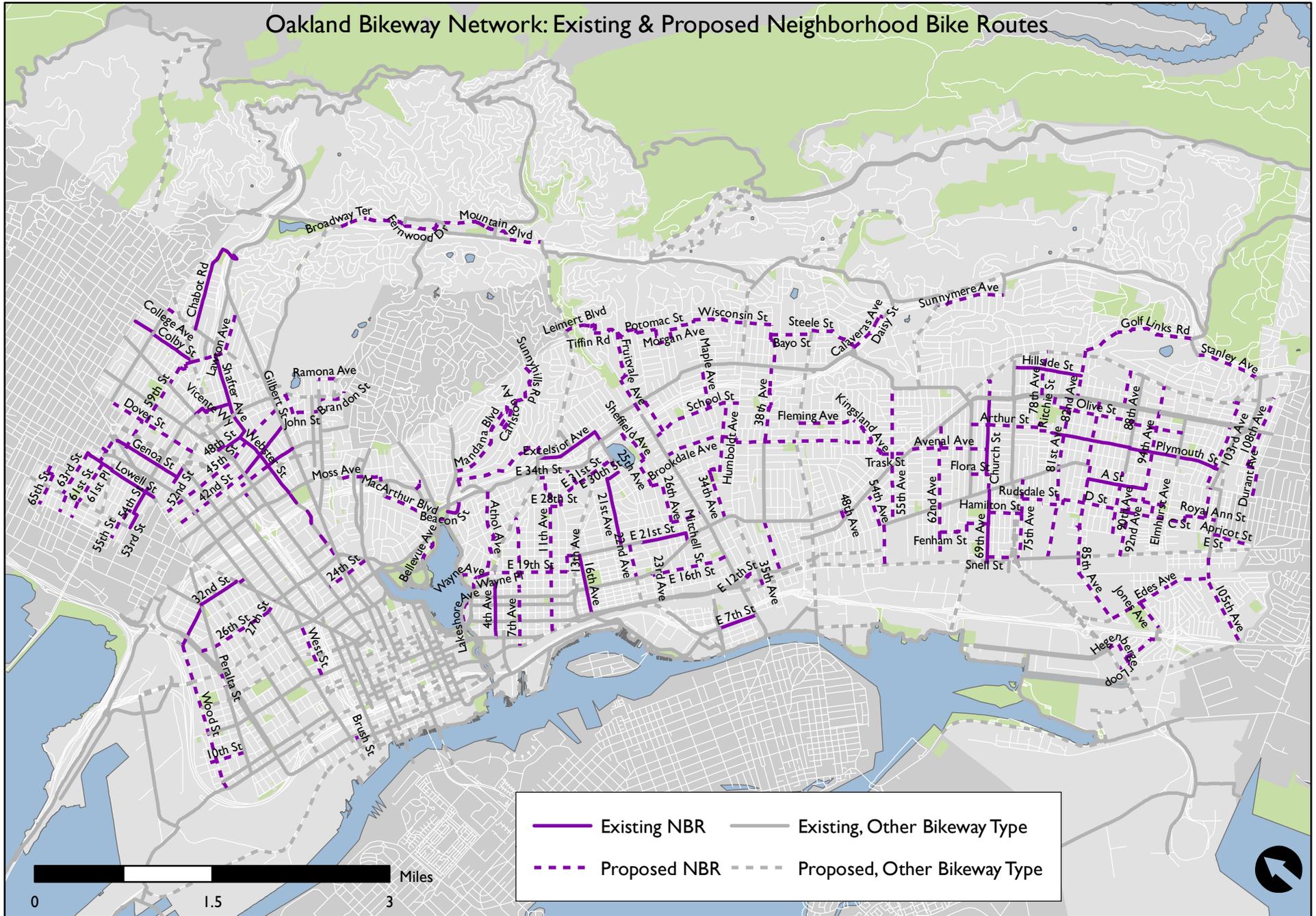


Figure 1: Neighborhood Bike Routes Map

Projects implementing NBRs on streets with traffic speeds and volumes above these thresholds should strive to reduce speeds and volumes to below these targets. Existing bike-ways that exceed these targets will be classified as bike routes, not as NBRs.

Some proposed NBRs may need ongoing monitoring if the existing traffic calming is insufficient to achieve the targets, or if traffic patterns change. If the route is not meeting those targets, additional traffic calming should be considered. This new monitoring system can be incorporated into Oakland's annual counts program.

2. Route Establishment

An NBR includes pavement markings, bike route signs, traffic calming (typically a minimum of one speed hump/table/cushion per block as feasible), and consideration of pavement quality.

Mid-Block Bicycle Pavement Markings

Install sharrows per current City standards (Figure 2). (Also see Issues for Further Discussion, page 11.)

Intersection Bicycle Pavement Markings

No markings are needed at unsignalized rectilinear local/local intersections, where both streets are 40' wide or less. At other intersections apply the following:

Use chevrons (Figure 3, and see OakDOT Design Detail RM-10) at:

- Signalized and/or skewed intersections with four or fewer approaches;
- In large traffic circles;
- Transitions to/from bike lanes; and
- Where one or more streets are wider than 40'.

Use green-backed sharrows (Figure 4) at:

- Offset intersections;
- Intersections where a bikeway turns;
- Complex multi-legged intersections; and
- Across divided roadways.



Figure 2: Oakland sharrow



Figure 3: Intersection chevron markings, 38th Ave and Brookdale Ave



Figure 4: Green-backed sharrows, Waller St and Pierce St, San Francisco



Figure 5: 50 ft double centerline

Other Pavement Markings

Include speed hump markings, stop stencils (as needed), and centerlines (50 LF) approaching controlled intersections (Figure 5). Avoid the use of edge line stripes and continuous center lines. (Per CA MUTCD Section 3B.01, centerlines are not required on local streets. On urban collectors and arterials, centerlines are required on roads that are at least 20' wide and have ADTs of 6,000 vehicles per day or greater.)

Bicyclist Guide Signs

Install bicycle guide signs per current City standards (Figure 6)². In areas with few supported destinations (per City standards) and where an NBR does not connect to other signed bikeways, guide signs and decision signs may be sufficient. Where the new NBR does not connect to another signed bikeway, signs can be deferred. Also see Issues for Future Discussion, below.

Pavement Considerations

Projects implementing new NBRs should consider the pavement quality on the proposed route in determining the feasibility of the project. If resurfacing would be beneficial but is cost-prohibitive, consider spot pavement repairs or paving only the travel lanes and not the parking lanes. Where possible, work should be coordinated with the City Council-adopted paving prioritization plan.

If the paving plan (or another project) will pave only part of a proposed NBR, the new route should only be implemented in the following situations:

- where the new segment connects to another existing bikeway (example: 45th St, Linden St to Market St);
- where the pavement quality of adjacent segments allows the installation of a longer bikeway; or
- if additional resources for paving have been secured for the adjacent segments.

If one of these three criteria is not met, the new NBR should not yet be designated. However, speed humps and/or other traffic calming should be considered.

3. Traffic Calming

All NBRs should include traffic calming with a minimum of one speed hump per block (as feasible). Additional traffic calming may be necessary to achieve the targeted speeds and volumes specified above.

Volume and Speed Management

Discourage through traffic and reduce motor vehicle volumes and speeds through the implementation of traffic calming measures, such as vertical deflection (speed humps/cushions/tables), traffic circles (Figure 7), islands (Figure 8), and diverters (Figure 9). At minimum, an NBR should include one speed hump per block as feasible.



Figure 6: Oakland bike route sign

² <https://tinyurl.com/OakDOTBikeWayfinding>



Figure 7: Traffic circle (Shafter Ave, Oakland)



Figure 8: Island cut-through (Channing St, Berkeley)



Figure 9: Diverters (left to right, Milvia St, Berkeley; 55th St east of Telegraph Ave, Oakland; Russell St, Berkeley)

Speed humps may not be feasible on all blocks due to block length, street grade, or conflicts with utilities or driveways³. Additional speed humps and/or other calming measures should be applied when traffic volumes and/or speeds exceed OakDOT's guidelines.

Daylighting

Parking may be removed up to 20 feet from the curb return on intersection approaches (standard best practice for all streets).

Traffic Restrictions

Current City policy governing street closures is in City Council Resolution 71056 C.M.S. (1994) "Resolution Adopting Rules and Regulations Governing the Prohibition of Entry To, or Exit From, or Both From City Streets." To close a street, the following conditions must be met:

1. the street's functional classification designates it as a local street;
2. where unwarranted through traffic is using the street;
3. 67% or more of residents support the change; and
4. a determination that the health and safety of the residents of the street and of neighboring streets will not be adversely affected.

³ www.oaklandca.gov/services/apply-for-a-speed-bump

Access restrictions (Figures 8 and 9) should be considered where the volume of cut-through traffic is incompatible with a street’s designation as an NBR. Access restrictions should be designed to reduce or eliminate through traffic while allowing local access (e.g., right-in/right-out only at collectors and arterials). Proposals for traffic restrictions require basic study and outreach (per Resolution 71056) and may need an area-wide traffic study to determine where the traffic would be diverted to help communicate the diversion to affected residents, and, potentially, to determine if additional traffic calming is needed to address impacts created by that diversion.

Resolution 71056 does not allow partial or full closures to streets classified as collectors or arterials. Such streets could be reclassified as local streets to allow for access restrictions. This reclassification process is managed by Caltrans, as designated by the Federal Highway Administration to oversee the functional classification of California’s roadways. The request process requires a City Council resolution, concurrence by the Metropolitan Transportation Commission, and approval by Caltrans.

4. Traffic Control

Through and cross-traffic on NBRs should be controlled to give bicyclists priority and create safe crossings.

Stop Control at Local Streets

Minimize the number of intersections along NBRs where cross traffic does not stop.

- Intersections of NBRs and local streets should be either: (1) stop-controlled on the local approaches only (preferred); or (2) all-way stop-controlled.
- Intersections of two NBRs should be all-way stop-controlled.
- Where stops remain on the NBR, install the supplemental stop sign placards (Figure 10), “ALL WAY” or “CROSS TRAFFIC DOES NOT STOP” as applicable.
- When stops are eliminated on an NBR, monitor post-project traffic volumes and speeds to determine if changes in stop control should be accompanied by traffic calming (if not already included).

Figure 10: Stop Sign Supplemental Placards



Prior to the removal of stop signs:

- Review traffic volumes (vehicle, bicyclist, pedestrian) to ensure the volumes are lower than the thresholds that typically warrant stop signs.
- Conduct a visibility study including sight triangle analysis and approach speed data collection.
- If visibility is limited, can obstructions be removed or approach speeds reduced? If not, do not remove stop signs. Existing speed data must show speeds that do not create sight distance triangle limitations prior to stop sign removal. (Speed data should not be inferred based on future installation of traffic calming features.)
- Review crash history to ensure there are no crash trends that would be exacerbated by stop sign removal.

Figure 11: Treatments for Uncontrolled Crossings of Arterials and Collectors



Bicycle warning sign (Market St/61st St, Oakland)



RRFBs (Broadway/23rd St, Oakland)



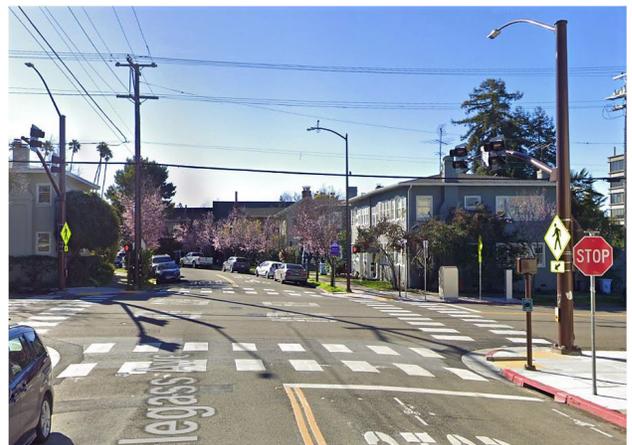
High-visibility crosswalk (Lowell St/Stanford Ave, Oakland)



Curb extension (Virginia St/Shattuck Ave, Berkeley)



Median island (source: NACTO Guide)



Passive bike detection (Hillegass Ave/Ashby Ave, Berkeley)

Uncontrolled Crossings of Collectors and Arterials

Work to eliminate such crossings. Where they cannot be eliminated, install treatments that support bicyclists at uncontrolled crossings of collectors and arterials. Possible treatments (see Figure 11, previous page), from low to high intensity and cost, include:

- Bicycle warning signs;
- “BIKE XING AHEAD” pavement legends;
- High-visibility crosswalks;
- Bikeway markings through the intersection;
- Stop signs;
- Median islands;
- Rectangular rapid flashing beacons (RRFBs) with bicyclist-accessible push button actuation;
- Curb extensions;
- Pedestrian hybrid beacons (PHBs) with passive bicyclist detection; and
- Traffic signals.

Figure 12: Treatments for Offset Intersection Crossings of Arterials and Collectors (source: NACTO Guide)



Bike lanes



Bicycle turn pockets



Two-stage turn queue boxes



Two-way cycle track

Offset Intersections at Collectors and Arterials

NBRs should avoid shared-lane situations on the major street wherever possible. Possible offset intersection treatments (Figure 12, previous page) may include:

- Bike lanes;
- Bicycle turn pockets;
- Two-stage turn queue boxes;
- Two-way cycle tracks;
- Pedestrian hybrid beacons with passive bicyclist detection; and
- Traffic signals.

Treatments are context-sensitive and respond to available width, traffic volumes, and the presence of a center turn lane, bike lanes, and/or a traffic signal.

5. Public Notification and Comment

Residents on and near proposed NBRs should be notified early in the project development process when public comments can be addressed. Typically, the City will send a project mailer to addresses within 400' of the proposed bikeway describing the project and providing an opportunity to weigh in and, optionally, to provide supporting comments. For NBR projects, an additional notification should be sent to addresses immediately adjacent to the locations of proposed traffic calming. Projects that restrict traffic (e.g., street closures, turn restrictions) may involve a broader process to address neighborhood concerns associated with diverted traffic.

Whether from mailers, surveys, meetings, or other contacts, the City should strive to resolve concerns as feasible within the scope of the project and with the design tools available to OakDOT. Possible solutions include expanding the scope of work to address the concerns of neighbors on nearby streets; or reducing the scope of work to eliminate traffic calming elements proposed in particular locations. General concerns regarding the project's goals (e.g., slowing traffic) may not lead to changing the project but may entail additional outreach. Conversely, a proposed speed hump may be deleted or relocated, for example, in response to a resident with a physical disability who benefits from a level parking space in front of their home. The purpose of public notification and comment is to achieve the OakDOT Strategic Plan goal on Responsive Trustworthy Government by "providing Oaklanders with an open, accessible and efficient transportation agency."

Issues for Future Discussion

Type of Pavement Marking

These guidelines assume that low stress bike routes are going to be referred to as Neighborhood Bike Routes in maps and communications materials, and thus recommend the use of sharrows per current City standards (Figure 1). However, some favor City of Berkeley style BIKE BLVD pavement markings (Figure 12) which are larger and convey an understandable “brand.” However, BIKE BLVD markings would not be consistent with the NBR naming. Further, concerns have been raised that local residents may perceive such markings as a harbinger of unwanted gentrification. Some favor an enlarged sharrow marking. Concerns include the ability of contractors to procure and use custom pavement legends.

Additional Placemaking Signs

To address the following recommendation from the Bike Plan: “OakDOT will engage communities in a collaborative design process to develop placemaking signage for Neighborhood Bike Routes. The signs will complement bicycle wayfinding signage by depicting neighborhood identities.” (p.121)

Modified Street Name Sign

In addition to placemaking signs, and to complement guide signs, modified street name signs, similar in purpose to those used to mark bike boulevards in Emeryville and Berkeley (Figure 13) could be considered. The advantage of a modified street name sign is that NBRs would be easier to identify—particularly at intersections. A preliminary estimate indicates that 50 street name signs would be required per centerline mile of NBR. To meet this standard along the 14 centerline miles of existing NBRs, it is estimated that 700 street name signs would need to be replaced or modified. (This estimate is based on Cavour St which is 0.2 miles long, with five intersections, and two street name signs per intersection.)

The “Idaho Rule”

When approaching STOP controlled intersections on local streets, most bicyclists yield and do not come to a complete stop. In recognition of this, the state of Idaho passed a law in 1982 allowing bicyclists to treat STOP signs as yield signs. Similar rules have since been adopted in Delaware, Colorado, Oregon, and Washington (https://en.wikipedia.org/wiki/Idaho_stop). Various attempts have been made to pass this law in California, but to date, they have not been successful. With such a law this typical behavior by bicyclists would become legal behavior, thus reducing the impetus for removing STOP signs on NBRs. A possible disadvantage is that bicyclists could exercise less caution at STOP signs than they do today.

Emergency Response Classification Map

OakDOT should consider partnering with OFD, OPD, and other stakeholders to develop a map of emergency vehicle stations and routes and seek review and vetting when proposing traffic calming on major emergency vehicle routes.



Figure 13: Bicycle boulevard marking



Figure 14: Street name signs