



Greenways Traffic Impacts Study

Context

The Pasadena Bicycle Transportation Action Plan (BTAP) calls for creating four North/South streets with reduced traffic volumes and speeds, known as Greenways. The most recent design for these streets, described in a 2021 feasibility study by the contractor KOA, removed all the traffic reduction elements from the design. That choice fails to implement the concept described in the BTAP, and also ignores “national best practices” as described by the National Association of City Transportation Officials.

When asked about the design, Pasadena DOT staff have raised the concern that a traffic study will be needed to estimate the potential impacts on traffic flow due to reducing traffic on the Greenways. In this document, we attempt to provide one such (unofficial) study, using only a very basic set of tools.

Summary

Our conclusion is that the total traffic on the Greenways represents a negligible fraction of total North/South traffic within the city of Pasadena. For example, the amount of traffic that needs to be diverted to follow national best practices amounts to less than a 3% fraction of the traffic already carried by just a handful of other high-traffic North/South streets in the city. Moreover, including a reasonable model for the number of car-trips that could be replaced by biking and walking if safe Greenways were implemented could entirely offset this tiny change, so that the net effect - while still small - could be an **overall reduction** of traffic within the city. Such a result would be consistent with the experiences of other cities, which shows that creating safe spaces for walking and biking shifts some car trips to more sustainable options.

For this reason, the concern that Greenways could have negative impacts for traffic flow is not valid, and should be dismissed. While DOT staff may wish to pursue additional studies, it is clear that reducing traffic on the Greenways will have no significant impacts on overall traffic flow within the city, and we believe that further study can only confirm this conclusion.

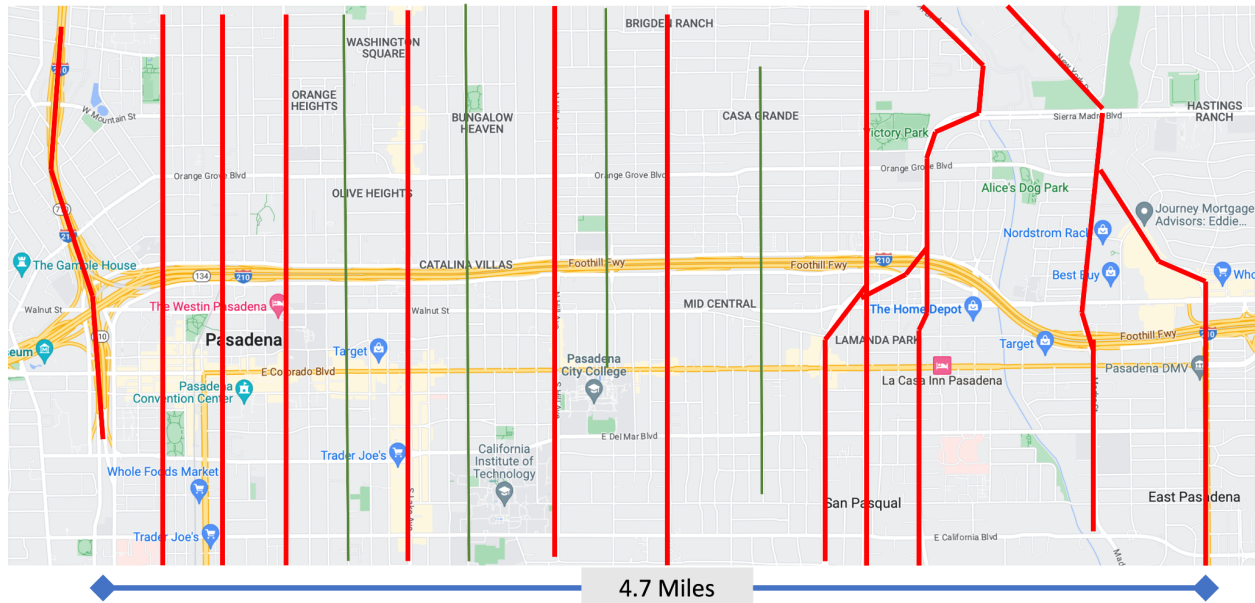
High Volume Streets

Pasadena has 16 high volume North/South streets:

St. Johns Avenue, Pasadena Avenue, the 210 / 710 Freeways, Fair Oaks Avenue, Raymond Avenue, Arroyo Parkway, Marengo Avenue, Los Robles, Lake Avenue, Hill Avenue, Allen Avenue, Sierra Madre Blvd., Altadena Drive, San Gabriel Blvd., Madre Street / Sierra Madre Blvd., Rosemead Blvd.



Of these, 12 high volume streets - listed in bold - carry vehicles across the 210 freeway. These are marked with red lines in the map below, along with the 4 proposed Greenways marked in green.



All of the red, high-volume streets carry traffic volumes that far exceed the current traffic volumes on the proposed Greenways. Based on average daily traffic counts, the network of 12 high-volume car streets carries 221,000 North/South car trips each day, as measured at locations near Colorado Boulevard.

Pasadena's high volume North/South streets

Road	Average Daily Traffic Counts	Notes
Pas Ave / St. Johns	30,000	Counting these together, as they are one-way
Fair Oaks	22,000	City data
Marengo	15,000	City data
Los Robles	15,000	Greenways Feasibility Study; carries 20k north of Colorado
Lake Ave	22,000	Greenways Feasibility Study; carries 31k north of Colorado
Hill Ave	20,000	City data
Allen Ave	15,000	City data (20k north of Colorado, 10K south of Colorado)
Sierra Madre Blvd	16,000	City data
Altadena Dr	10,000	City data (20k near 210 crossing)
San Gabriel Blvd	20,000	City data
Sierra Madre Villa	21,000	City data



Rosemead Blvd	15,000	City data
Total	221,000	Cars per day carried by these 12 high volume streets

For comparison, the Greenways Feasibility Study includes similar data for the four proposed Greenways. Strikingly, the Greenways carry far less traffic than these 12 high volume streets. In fact, the total traffic on all four Greenways *combined* is less than the traffic on even a single high volume street.

Greenways: Average vehicles per day			
	Current traffic volumes on Greenways (per day)	Maximum number of average cars per day allowed for a Greenway, per NACTO guidelines	Proposed Change
El Molino	7,000	2,000	-5,000
Wilson	3,000	2,000	-1,000
Sierra Bonita	1,500	2,000	0
Craig	2,000	2,000	0
Totals	13,500	N/A	-6,000

Using these numbers, we can try to understand the likely impacts - if any - on traffic in Pasadena by reducing cut-through traffic on the Greenways.

First, we note that the total amount of traffic carried on the Greenways represents an incredibly small fraction of the overall north/south traffic in Pasadena. Across the whole city, there are about 50 N/S streets, with 16 of these streets high volume, and 12 high volume streets crossing the freeway. Even if we ignore the traffic carried on most of these 50 streets, and focus only on the 12 high high-volume streets that cross the freeway, we find that the total traffic on the Greenways is around 6% of the traffic carried by these 12 high-volume streets. So - even if we were to remove all cars from the Greenways (something nobody is proposing), the high volume streets could clearly absorb the small amount of additional traffic without any problems.

As noted, there is NO proposal to eliminate all car traffic from those four streets. The Greenways will continue to carry neighborhood traffic after implementation. We can estimate the impacts of this modest change in traffic patterns by imagining that traffic on the Greenways were reduced to the target volumes set by the NACTO All Ages and Abilities Guidelines, and



that only the “excess” cars were diverted to the high volume streets. This estimate is shown in the “Proposed Change” column of the above table, and amounts to a change of just 6,000 cars per day on the high-volume streets, for a fractional change in traffic volumes of only 2.7%.

	Greenways	High Volume Streets	Fraction
Current Traffic	13,500	221,000	6.1%
Traffic that needs to be diverted per NACTO Guidelines	6,000	221,000	2.7%
Estimated traffic reduction due to more trips by biking and walking			1-3%

However, even this 2.7% number is extremely pessimistic, because it assumes that traffic volumes in the city will remain fixed after implementing the Greenways. **A key goal of implementing safe biking infrastructure is to encourage more trips by biking and walking, thus replacing some car trips, and reducing overall traffic in the city.** Many European cities that have implemented safe biking infrastructure see bikes used for 20-40% of trips, and American cities with successful biking infrastructure realize around 10% or more of trips by bike. Therefore, it is reasonable to expect that implementing safe Greenways, along with the new bike lanes on Cordova and Union Street, should encourage some car trips in Pasadena to be replaced by walking and biking. Indeed, such a result would be consistent with the experience of dozens (if not hundreds) of cities world-wide. As a single example, the city of Palo Alto, California implemented a network of Greenways, and as a result, today 48% of their public school students choose to bike to school, eliminating thousands of daily car trips that would have been taken for school drop-offs and pickups.

With this context, it is reasonable to expect that implementing high quality Greenways would result in at least some mode-shift in Pasadena, where a slightly larger fraction of car trips are replaced by walking and biking. Based on studies in other cities, we estimate the likely impact to be a city-wide reduction in traffic by 1-3%. In this scenario, this modest reduction in traffic would be as significant as the tiny fraction of trips shifted away from the Greenways onto high-volume streets. Therefore, we believe a likely result of implementing high-quality, All Ages & Abilities Greenways, would be a **net reduction of traffic** on other streets in Pasadena.

High-volume car network density

In understanding the efficacy of the car network in Pasadena, it is important to consider the density of the network. Of course, if drivers have to travel a large distance to reach a



high-volume street, they might be tempted to use neighborhood roads and/or Greenways as “cut-throughs” to reduce travel distance.

Fortunately, the 16 high-volume N/S streets in Pasadena, including the 12 high-volume streets that cross the 210 freeway, form a dense network that can be quickly accessed from any location within the city. The average spacing of the 12 high-volume routes that cross the freeway is just 0.39 miles, or about 4 blocks. This means that drivers are rarely more than 2 blocks (0.2 miles) away from a high-volume N/S street. So, accessing one of these streets for N/S travel should never take a driver far out of their way.

Moreover, for the most part, Pasadena streets are laid out in a simple grid pattern. This means that, for nearly any trip of a length of a mile or more, drivers in Pasadena will need to cross a high-volume N/S street at some point in their journey, and will typically cross several. So in most cases, people driving cars can choose a high-volume N/S street without adding **any distance** to their trips, as the grid pattern allows a choice of streets when traveling. An additional goal of the Greenways project should be to reduce cut-through traffic on the neighborhood Greenways by diverting cut-through traffic to these 12 high-volume streets. The high density of these high-volume streets means this can be done with essentially no inconvenience to people driving cars.

Conclusions

Our conclusion is that following All Ages and Abilities guidelines in implementing the Greenways will have a negligible impact on traffic flow in the city, and should at most adjust traffic levels on high volume streets by around 1%. Because safe Greenways will encourage some mode shift from driving to biking, it is likely that there will actually be a small **reduction** in traffic on streets across the city.

References

- Traffic counts data
 - City traffic data:
<https://pasadena.public.ms2soft.com/tcds/tsearch.asp?loc=Pasadena&mod=>
 - LA Almanac:
<https://www.laalmanac.com/transport/tr26b.php#210>
- Analysis Data
 - <https://docs.google.com/spreadsheets/d/1HLePYqhcvajIkTZ-hiWkEwHmflGZuojsIOTxEYeCRzE/>
- Greenways Information Packet
 - <https://www.pasadenacsc.org/aaa-greenways>



- Statistics on biking rates and modal shifts due to infrastructure
 - <https://www.pasadenacsc.org/blog/the-case-for-biking-in-pasadena>
 - <https://www.government.nl/documents/reports/2018/04/01/cycling-facts-2018>
 - https://bikeleague.org/sites/default/files/Where_We_Ride_2017_KM_0.pdf

- Modal shift estimate: Data in other American cities has shown that increasing the number of bike route lane-miles by 50% tends to double the number of trips taken by biking. The Greenways will increase bike route lane-miles by roughly this amount, and so the fraction of trips by biking in Pasadena could reasonably be expected to double after implementing the Greenways.