

August 17, 2015

Dear Mayor Tornek and City Council Members,

Over three thousand citizens participated in many workshops over many years and, as a result, Pasadena Planning Staff came up with a balanced growth/cap recommendation. Some citizens urged higher density caps; now Staff and the Planning Commission are offering a compromise that I hope you will approve.

While development can gallop along quite quickly, it takes longer to absorb and understand its impacts. This city, 24 square miles and surrounded by neighborhoods, could easily lose the very charm, character and quality of life that make our city so attractive to so many.

It will take time for our city staff and city processes to appropriately incorporate the many development requests that are coming our way. This is especially true if we continue to adhere to the Pasadena Way and incorporate citizen engagement in this process.

We must be mindful that growth is accompanied by traffic, noise, and air quality impacts. It is of the utmost importance that we balance growth to maintain clean air, open space, city views, historic preservation, and quality buildings (design and materials).

I hope you will approve City Staff and Planning Commission development capacities [a combination of the Proposed Project and the Central District, South Fair Oaks, Lincoln Avenue (Lamanda Park Alternative).]

Thank you for your consideration.

Sincerely

Audrey O'Kelley

Jomsky, Mark

From: Thyret, Pam
Sent: Sunday, August 16, 2015 8:46 PM
To: 'Kristin Harrison'
Cc: Wilson, Andy; Jomsky, Mark
Subject: RE: City Council Meeting on August 17th

Berkeley,

Thank you for your note.

Pam Thyret
District 7 Field Representative for Councilmember Andy Wilson
(626) 441-4802

-----Original Message-----

From: Kristin Harrison [<mailto:ktharrison@sbcglobal.net>]
Sent: Sunday, August 16, 2015 8:03 PM
To: Thyret, Pam
Subject: City Council Meeting on August 17th

Pam-

Kristin and I would like to voice our concerns that the City of Pasadena is starting to cross the tipping point and lose some of its charm as it continues to grow and become more dense.

While adding bike lanes and leveraging the Gold Line are logical steps to make the city more livable, the seemingly endless apartment and condominium projects in various pockets of the city will only result in more cars and more traffic.

Putting streets on "diets" and suggesting that people take the Gold Line or ride their bikes won't get most of them out of their cars; more people in our city means more cars on our roads.

Please convey our concerns to the City Council.

Thanks,

Berkeley & Kristin Harrison

08/17/2015
Item 20

Jomsky, Mark

From: Geoffrey Baum <glbaum@msn.com>
Sent: Sunday, August 16, 2015 7:54 PM
To: Tornek, Terry; Masuda, Gene; McAustin, Margaret; Madison, Steve; Kennedy, John; Hampton, Tyron; Gordo, Victor; Wilson, Andy
Cc: Beck, Michael; Jomsky, Mark; Bertoni, Vince; 'goes to Board and only board WPRA Board'; West, Jana; 'Andy Wilson'; Suzuki, Takako
Subject: WPRA urges support for reasonable density objectives in Pasadena General Plan
Attachments: WPRA Letter of Support for Reasonable Growth in Pasadena.pdf

Dear Mayor Tornek and Councilmembers Gordo, Hampton, Kennedy, Madison, Masuda, McAustin, and Wilson:

The West Pasadena Residents' Association urges you to accept the Planning Commission recommendations for reasonable density expansions, rather than the outsized density recommendations in the Final EIR of the City of Pasadena's General Plan Land Use Element.

The development caps recommended by the Planning Commission are 6,365 residential units (du) and 5,825,000 nonresidential square feet of development allocated across the seven Specific Plan areas. This is far superior to the outsized and concentrated recommendations in the Final EIR, which are 7,905 residential units and 7,675,000 square feet of development with 62% of the residential units and 44% of the development concentrated in the Central District.

While Pasadena's growth may be inevitable; it needs to be managed so it is beneficial for all residents to live and work in areas that include diverse housing choices, open spaces, recreational and educational facilities, public and private services, and accessible modes of transportation.

WPRA offers the following points to the City Council as it deliberates growth and its possible outcomes:

1) Realizing the vision to build an adequate supply of diverse housing opportunities

Pasadena is a city where development can only grow up not out. Pasadena is recovering from the Great Recession with a resurgence in residential and non-residential development. The effects of this resurgence have not yet fully been realized. Much of the new construction is unoccupied and many approved projects have not yet broken ground. In developing their original density recommendations, City planners did a very thorough job analyzing the city's potential for absorbing development and balancing the need for growth with the desire for clean air, open space, city views, and historic preservation, to name a few factors. We urge you to support reasonable growth alternatives so that all residents of Pasadena can access an improved vibrant urban core without enduring the unhealthy, unmitigated consequences of traffic, noise, poor air quality, and more importantly, the permanent loss of Pasadena's rich cultural heritage.

2) Excessive density will produce excessive traffic.

Pasadena's General Plan Guiding Principal #5 is "*Pasadena will be a city where people can circulate without cars.*" The issue of cars and transportation is fraught with many questions, not the least of which is the issue of the unfinished 710 connector. As Pasadena, along with our numerous regional neighbors, grapple with solutions, it is obvious that Pasadena may not be in control of its own destiny. Pasadena may plan for higher density living in neighborhood and transit villages, but until the people who LIVE in Pasadena, WORK in Pasadena, or until public transit expands to the point where it can efficiently move people into, around, or through the city, the idea that Pasadena will be reducing car trips any time soon is an incorrect assumption.

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An outsized growth cap producing more cars and car trips does not foster a higher quality of life for Pasadena residents. We urge the City Council to trust the analysis of its city planners and housing commissioners. Adopt the reasonable cap growths and save our city from paralyzing gridlock and dirtier air.

3) Pasadena as a socially, economically and environmentally sustainable community

A higher density population does not necessarily meet the criteria of a greener Pasadena. Pasadena's General Plan, Guiding Principal #4 contains the following: *Pasadena will be a socially, economically, and environmentally sustainable community.*

Lower density growth is more consistent with Pasadena's strong commitment to the environment. The City has already taken a number of significant actions to become a greener city, such as:

- Adoption of an Environmental Charter;
- Endorsement of the United Nations Green Cities Declaration and Urban Environmental Accords;
- Endorsement of the US Conference of Mayors Climate Protection Agreement;
- Adoption of a Green City Action Plan;
- Adoption of ordinance creating an Environmental Advisory Commission;
- Adoption of a Green Building Program;
- Adoption of a resolution in support of Green Cities California.

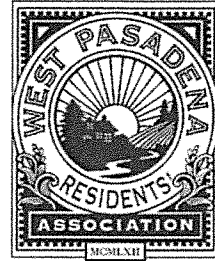
Pasadena's General Plan Land Use Element should align with Pasadena's commitment to environmental sustainability. A reasonable growth cap is more consistent with our core values in protecting the environment, as opposed to the outsized density that would aggravate adverse environmental impacts.

In conclusion, we believe the City Planning Department and our Planning Commissioners have done their homework and devised the best benefit-for-all vision for growth. In time, the issues of transportation, higher density living spaces, affordability, diversity, and economic opportunities will begin to mature, presenting a clearer, more solid base on which to build. We urge you to accept their recommendations for reasonable density growth while preserving the unique qualities and characteristics that have drawn generations of diverse residents and business owners to choose Pasadena as their home.

Sincerely,



Geoffrey Baum
President, West Pasadena Residents' Association



DATE: August 16, 2015
TO: Pasadena City Council
FROM: West Pasadena Residents' Association
SUBJECT: Support for Reasonable General Plan Density Objectives

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which to build. We urge you to accept their recommendations for reasonable density growth while preserving the unique qualities and characteristics that have drawn generations of diverse residents and business owners to make Pasadena their home.

Sincerely,

A handwritten signature in black ink, appearing to read 'G. Baum', with a long horizontal stroke extending to the right.

Geoffrey Baum
President, West Pasadena Residents' Association

Jomsky, Mark

From: Stefanos Polyzoides <spolyzoides@mparchitects.com>
Sent: Sunday, August 16, 2015 6:17 PM
To: Greg Gunther; De La Cuba, Vannia; Andy Wilson; Thyret, Pam; Madison, Steve; Masuda, Gene; McAustin, Margaret; Gordo, Victor; Tornek, Terry; Bell, Cushon; John Kennedy; Sullivan, Noreen
Cc: Jomsky, Mark; Jonathan Edwards; Greg Gunther
Subject: Density vs Traffic

Dear Mayor Tornek and City Councilmembers -

The WPRA's position on the General Plan is seriously flawed. One of its central arguments, that higher housing density generates ever more traffic, is 20 years behind the times. It is just not supportable by either current traffic engineering thinking or standards.

It is a fact that in every Metropolitan Center of the US, including Pasadena, the higher the housing density of a building type, the less the car traffic they generate. It is our national transportation standards are the catalyst for this kind of performance. ITE trip generation numbers per house and housing type below illustrate my point: The denser the type and project, the lower their trip generation coefficients:

Single-Family Detached Housing ITE Code 210	100 units	1.01/ unit
Single-Family Detached Housing ITE Code 220	100 units	2.74/ unit
Apartment	100 units	0.62/ unit
Low-Rise Apartment ITE Code 221	100 units	0.58/ unit
High-Rise Apartment ITE Code 222	100 units	0.35 unit
Mid-Rise Apartment ITE Code 223	100 units	0.39/ unit

Further, if housing is arranged in neighborhoods of walkable, mixed- use blocks, and there is also reasonable access to transit, an extra 25 to 30% of traffic reduction can be achieved through the use of transportation modes alternative to the single driver private vehicle.

Insisting on a General Plan that lowers densities in new development in the center of our City, locks us into car dependance and perpetuates the kind of low- rise development gridlock that is the very definition of sprawl. The critical question for all of us to consider now is what the appropriate mixes of density and form for a City Center like Pasadena's should be, on a block by block basis. This is the issue you should vote to focus on and not controlling growth through development caps or through using such caps with arbitrarily low development targets.

Fighting density in principle or on a project basis is not the approach that Pasadena should be choosing to transition to its next economy and to enable the most amenable urban environment for all of us living here. It is time to capitalize on our massive recent successes over the last couple of decades controlling growth through proper design controls and access to new modes of transportation.

Stefanos

Stefanos Polyzoides

Principal

MOULE & POLYZOIDES, Architects and Urbanists

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Jomsky, Mark

From: Jonathan Edwards <jedwards@gmail.com>
Sent: Sunday, August 16, 2015 4:24 PM
To: De La Cuba, Vannia; Andy Wilson; Thyret, Pam; Madison, Steve; Masuda, Gene; McAustin, Margaret; Gordo, Victor; Tornek, Terry; Bell, Cushon; Kennedy, John; Sullivan, Noreen; Jomsky, Mark; Hampton, Tyron; West, Jana
Cc: Greg Gunther; dpnalist@gmail.com Neighborhood Association; cityclerk
Subject: General Plan > Downtown Pasadena Neighborhood Association's recommendation
Attachments: General Plan Letter for Final Approval - Aug 2015 v2.pdf

Dear Mayor Tornek and City Council, please find attached the Downtown Pasadena Neighborhood Association's recommendation for the **General Plan**.

We urge you to: **Adopt the General Plan swiftly, on Aug 17th, and in doing so to either eliminate the "development caps" altogether or adopt the maximum amount studied in the EIR.**

(I.E., to adopt either the "Proposed Project" or the "Efficient Transportation Alternative" but *not* the "CDSFOLA" alternative or the so-called "Refined Project.")

Jonathan Edwards • DOWNTOWN PASADENA NEIGHBORHOOD ASSOCIATION
CITRUST INSURANCE AGENCY / ACI COMMERCIAL INSURANCE BROKERS

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Qrys Cunningham
Wesley Reutimann
Marsha Rood
Mark Smutny
Brian Wallace

Sunday, August 16, 2015

Mayor Terry Tornek
Pasadena City Council
Tyron Hampton
Margaret McAustin
John J. Kennedy
Vice Mayor Gene Masuda
Victor Gordo
Steve Madison
Andy Wilson
City Manager Michael Beck
City of Pasadena Planning Department
Vince Bertoni
Vicrim Chima
Principle, The Planning Center, Woodie Tescher

Dear Mayor Tornek and Members of the City Council,

The Downtown Pasadena Neighborhood Association (“DPNA”) believes that the changes to our city and to our neighborhood—including growth and development—proposed in the General Plan are *positive* changes for the betterment of our city.

As with any change, bringing new development to our city poses significant challenges, and with that concerns. Discussion in the community often revolves around fears of negative impacts that may result. Those concerns are valuable for the purposes of improving the execution and management of growth and development, but concerns about negative impacts should not cause the city to overlook the positive transformation and improvements that is the entire Objective of The General Plan. We should not falter in our pursuit and proper execution of positive change.

In regards to our neighborhood, Pasadena’s 1994 General Plan set into motion a transformation that is less than halfway complete. We believe that the vacant lots, surface parking lots, dilapidated and/or poorly constructed projects, and even some serviceable-but-underperforming buildings in Downtown Pasadena can be transformed into great spaces that will create an attractive, vibrant urban pedestrian neighborhood. Look at Urth Café—from parking lot to urban oasis. Or the former Nest Furnishings which became (after a lawsuit to enforce design guidelines) the great Playhouse Plaza office complex, soon to house Alibaba’s U.S. Headquarters. [See Appendix A for a survey of such sites.]

Yes, there are areas of Downtown Pasadena that are under-performing in terms of contributing to an active, vibrant urban pedestrian neighborhood. They hold great potential to be transformed.

The DPNA’s core values fully support that transformation:

- Walkability — a sustainable city designed for pedestrians, cyclists, and public-transit users, where freedom from the automobile is a practical & comfortable lifestyle choice.
- Urban Revival — a return to a traditional “downtown” City Center as an exciting destination,

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the place of greatest vitality & activity.

- Economic Vitality — In an urban setting, local businesses function as public space, as an extension of residential private spaces. Therefore, the economic vitality of local businesses directly impacts residential quality of life.
- Commercial & Residential Coexistence — Downtown Pasadena is both a residential and a commercial area, and a mix of uses in proper balance is necessary.
- Great Public Spaces — a built environment (including privately-owned businesses) that engages people in *activities*, encourages *social interaction*, is *accessible*, and is *attractive & inviting*.
- A Sense of Place — a city with a unique identity, firmly grounded in respect for its history, with a clear vision and resolve for continued *bold progress*.

However, if sufficient change is prohibited via stunted “caps” on development, the transformation proposed *in principle* could be insufficient *in practice*.

We urge the City Council to embrace the positive vision—about which no disagreement exists—of the General Plan’s *Goals & Principles* by actually implementing them *in practice*. Implementation can only occur by allowing the change, growth, and density inherent in the land use map to develop.

RECOMMENDATION: Adopt the General Plan, and either eliminate the “caps” altogether or adopt the maximum amount studied in the EIR. The “Efficient Transportation” alternative is particularly attractive.

The “caps” should be eliminated because they distract attention and understanding away from the real purpose of the General Plan: to build a City of Choice and not of Default. Whether in five years or 20 years, future Pasadena citizens will not measure the success of our efforts by how many or how few residential units were built. They will not sum up square feet of commercial space, and declare, “Success! Only 2,000,000 square feet!” or “Failure! 4,000,000 square feet!” No, future Pasadenans will measure the success of our efforts against their quality of life that comes from living in the city.

- “The buildings that *were* built—how *good* are they?”
- “My housing costs—can I afford to remain in Pasadena? Will my grandchildren?”
- “My ability to earn a living, to get around town, to educate my children, to feel proud of “this place”—am I better off now?”

In essence, future Pasadenans will measure our success on whether or not we achieved all of the Principles, Goals, and Policies. The “caps” divert attention from the crux of the matter, provide false security or alarm, and incite squabbling. “Caps” **do nothing** to encourage or insure design standards of high quality; appropriate mix of uses to create attractive, inviting, and affordable places to live, work and play; or create neighborhoods that are not reliant on cars

If the “caps” *must* exist to serve CEQA purposes, then they should be set to the maximum amount, but only if there is great care and oversight given to each and every new development project to ensure consistency with the Principles, Goals, and Policies of Pasadena’s guiding documents. Only if **we do not hold developers to these principles, goals, and policies will there be failure, and this failure will occur whether we are a city of low density or high density.**

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RATIONALE: Why do we support either eliminating the “caps” altogether or adopting the maximum amount studied in the EIR?

1. **Because the housing is costly, and the supply of housing must be increased to keep pace with population growth and the desire of people to live in walkable neighborhoods close to transit.**

Residents of Pasadena are concerned that their incomes are not keeping pace with housing costs, they are worried that they may be unable to remain in the city, or their children and grandchildren may not be able to find a place to live within their means. This is a general concern across the region, but it is of critical importance to Downtown Pasadena because the rarity of walkable places throughout the entire Southern California region. As our region adapts to new modes of circulation, Downtown Pasadena will become even more desirable than it already is. It's supply and demand. Unless an ample amount of additional housing is built, the cost of living will become an even higher barrier to living in Pasadena.

2. **Because density is needed to support planning goals of neighborhood-serving retail, entertainment, and services; a wide range of housing options; a walkable environment with ample public open spaces; and robust public transit (and other non-car) mobility options. We must encourage increased housing to achieve this critical mass of residents.**

Some have argued that we should resist changes to our land use until “public transit expands” to service a low-density population, first, and then maybe perhaps we can discuss changes to land uses. The realities of budgets, politics, and sensible policy making, however, requires a critical mass of residents to justify and fund those planning goals.

3. **Because all of the proposed development levels are lower than they were in 1994.¹** We believe that the transformation of our neighborhood is at the less than halfway point. Development will continue to be the transformation engine. The *Quality* of that development is critical, and we must absolutely be focused on quality, but quality cannot be achieved simply by limiting *quantity*.

4. **Because (since properly executed development is the transformation engine) reducing allowable development shows a *diminishing commitment to actually achieving* the goals and principles that were so clearly affirmed by the community.**

5. **Because commercial development is on its way to reaching its limit within the first 5-8 years of a proposed 20-year plan.** The Parsons/Lincoln Properties planned development alone would consume a full 1/4 of the 20-year commercial allotment for the entire Central District.² Caps that are set too low might impose an inopportune moratorium that could damage the city. Pasadena needs a critical mass of employers in a compact area to provide a sound and consistent financial base for the

¹ 1994: 5,395 Residential Units in CD+SFO; 7,767,000 Commercial Sq Ft in CD+SFO.
2015: 4,885 Residential Units in CD+SFO; 3,379,000 Commercial Sq Ft in CD+SFO.

² The Parsons infill project will likely consume 600,000square feet and 400+ residential units.

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city. While Pasadena already has a significant employment base, we should retain the flexibility to respond to market demands in order to keep existing employers, add new ones, recognize the very long lead time large firms need when making decisions about space needs, encourage greater use of public transit by people commuting to work (i.e. most every place in Downtown is accessible by metro), and to provide an additional customer base for neighborhood retail, entertainment and services.

6. **Because Pasadena's economic and strategic advantages revolve around innovation, including being on the forefront of urban planning.** Walkable urban neighborhoods with an authentic sense of place are not only *desirable* and increasingly in *demand*,⁷ and both the general population and the planning profession now recognize such places as hotbeds of innovation. Improving walkability and transforming our streets and blocks into great "Places" will maintain and improve Pasadena's reputation for innovation and it will therefore provide a substantial economic benefit which, in turn, will redound to the General Fund. This will happen most effectively if the development levels and FARs, in combination with creating a quality built and natural environment, are sufficient.

7. **Because the Greater Los Angeles region is rapidly improving its regional rail network, and Pasadena should capitalize on its proximity to rail to a greater extent than currently envisioned.** Pasadena should not ignore its context within the greater Los Angeles region, particularly in regards to transportation. Greatly enhanced Gold Line connections will come on-line during the life of this General Plan (e.g. extension of the Gold Line eastward, the Downtown Connector, LAX connections, the Expo Line, the Purple Line, and other Measure R projects). The proximity of the Central District and South Fair Oaks to its increasingly viable (and therefore valuable) four Gold Line Stations demands increasing the opportunity to build for living, working, and playing next to these Gold Line stations.

⁷ See Leinberger, Christopher and Doherty, Patrick C., "The Next Real Estate Boom." The Brookings Institute, November 2010, <http://www.brookings.edu/research/articles/2010/11/real-estate-leinberger> and Becker, Sofia, Bernstein, Scott, and Young, Linda, "The New Real Estate Mantra: Location Near Public Transportation." March 2013. Report commissioned by the American Public Transportation Association in partnership with the National Association of Realtors.

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In closing, please notice page 4-11 of the Final EIR, which contains a Comparison of Alternatives to the Proposed Project.

Environmental Resource Area	Proposed Project	Central District, S Fair Oaks, and Lincoln Ave	Efficient Transportation Alternative	Reduced Air Quality & Noise Impact Alternative
ENVIRONMENTAL IMPACTS				
Aesthetics	0	0	0	0
Air Quality	0	-	-	-
Biological Resources	0	0	0	0
Cultural Resources	0	-	0	0
GHG	0	-	-	+
Hazards and Hazardous Materials	0	-	0	+
Hydrology and Water Quality	0	0	0	0
Land Use and Planning	0	0	0	-
Noise	0	-	-	0
Population and Housing	0	0	0	0
Public Services	0	-	-	+
Recreation	0	-	-	+
Transportation and Traffic	0	0	0	-
Utilities and Service Systems	0	-	-	+
QUANTITY OF DEVELOPMENT – (CAPS)				
Residential Units, citywide	7,905	6,365	7,905	7,905
Non-Residential Square Ft.	7,675,000	5,825,000	7,675,000	7,675,000

Returning to our opening theme, in making its decision Pasadena's City Council must consider the positive

Same *Quantities*, different *Qualities*

transformations and improvements that are the plan's objectives, along with potential negative impacts. In the minds of some people, negative impacts are the *only* result of growth and development. They equate quantity i.e. "more development" with "more traffic" and more negative impacts in a one-for-one ratio. That is a fallacious and outdated perspective, and Table 7-19 demonstrates the fallacy. Both the "Efficient Transportation Alternative" and the "Reduced Air Quality and Noise Impact Alternative" result in **fewer environmental impacts** (represented by the "-" sign and highlighted in green) than the Proposed Project **but contain the same development levels as the Proposed Project.** This proves that quantity is not the sole determinant of outcome and reinforces our supposition that we cannot improve quality of life in Pasadena simply by limiting quantity of development. The Goals, Policies, and Principles of the General Plan are the machinery which will shape the raw material of development into the final product—our *objectives*.

THE GENERAL PLAN: Embrace the vision to make our city better



DOWNTOWN PASADENA NEIGHBORHOOD ASSOCIATION

P.O. Box 967
Pasadena, CA 91102
626-539-3762
DPNAlist@gmail.com

Officers and
Board of Directors:
elected 10/16/2014

Greg Gunther,
President
Christine Fedukowski,
Vice President
Pat Roughan,
Vice President
Jonathan Edwards,
Secretary
Fried Wilson,
Treasurer

Joao Huang-Anacleto
Barbara Bell
Marilyn Buchanan
Qrys Cunningham
Wesley Reutimann
Marsha Rood
Mark Smutny
Brian Wallace

We should **embrace** that positive transformation and apply our efforts to executing it with distinction.

Sincerely,

Jonathan Edwards, Secretary/Past-President

On behalf of the board of directors of the
Downtown Pasadena Neighborhood Association

Attached:

Appendix A: A demonstration that the transformation of our neighborhood is less than half-way complete. Photos of areas in Downtown Pasadena that should be incentivized for pedestrian-oriented infill development. To zoom in on photos, or to view in color, please go to:

<https://www.facebook.com/media/set/?set=a.346850245384307.71499.207126989356634&type=1&l=bf467c2ae3>

Appendix B: Recent news articles on Greater Los Angeles' Housing affordability crisis, in relation to the supply of market-rate housing.

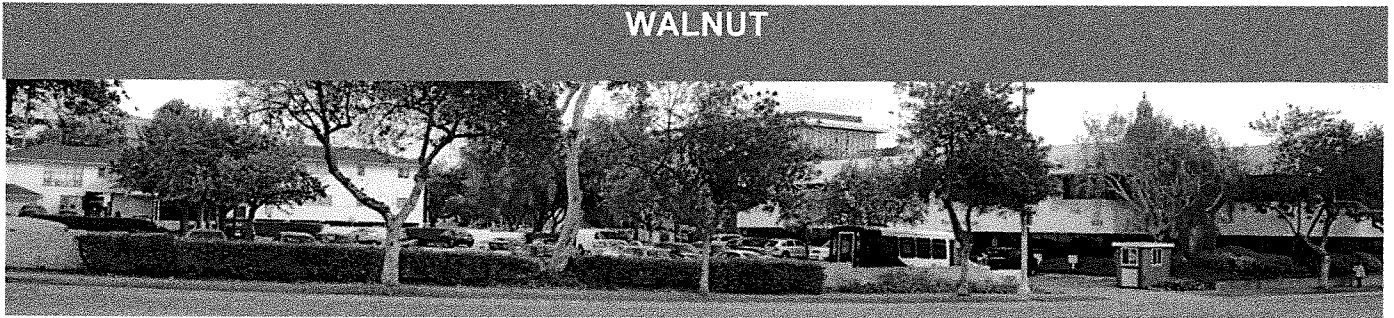
TRANSFORMATIONS TO OUR NEIGHBORHOOD
ARE LESS THAN HALF-WAY COMPLETE

APPENDIX A

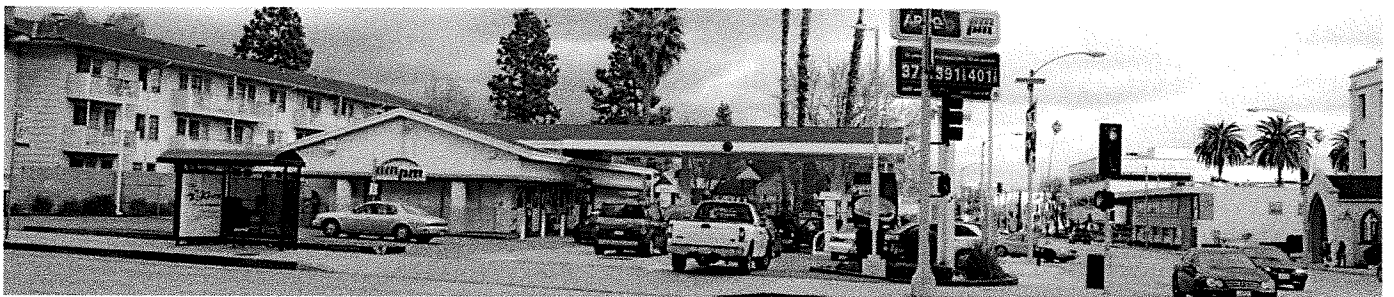
**Photos of areas in Downtown Pasadena that should be incentivized for
pedestrian-oriented infill development**

TRANSFORMATIONS TO OUR NEIGHBORHOOD ARE LESS THAN HALF-WAY COMPLETE

AREAS WHERE TRANSFORMATION AWAITS



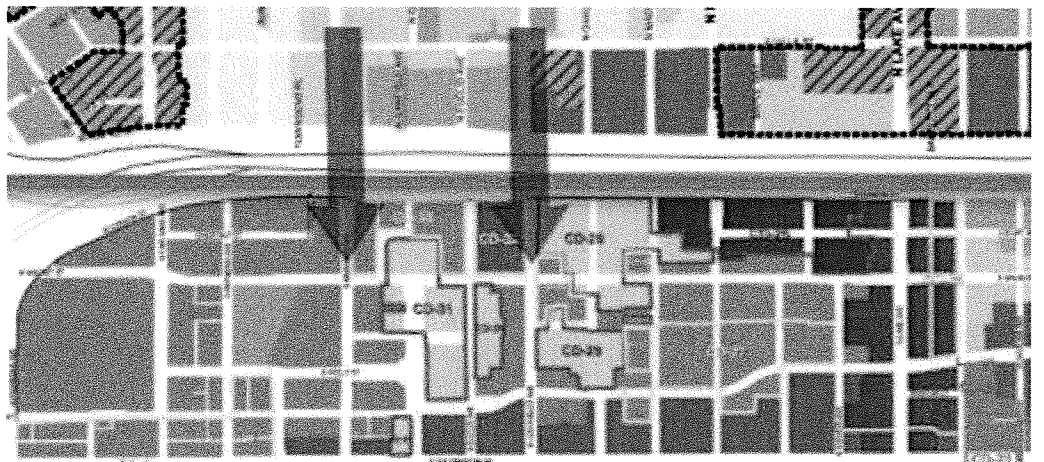
N Marengo Ave (between Corson and Walnut) – Opportunity for a high density office complex with neighborhood services such as dry cleaning, insurance office, etc. on the ground floor. Freeway adjacent.



Intersection of Walnut & Los Robles – The north half of this intersection, which consists of the pictured Arco, and, on the northwest corner, a large surface parking lot and parking garage for Kaiser Permanente, deadens and negates the attractive Congregational Church and Westin hotel, which lead into the Fuller Seminary and the Civic Center.

Marengo & Los Robles are “gateways” to Downtown Pasadena. These streets are natural entry points for residents who live in the Villa Park area, north of the 210 freeway, to walk to destinations within Downtown Pasadena.

Input from the community emphasized that the 210 freeway acts a ‘dividing line’ that should be mitigated. That “210 barrier” is not simply a function of the freeway; it is also due to the poor building and street design of the corridors



between Walnut Ave and the 210 Freeway. All the streets with bridges crossing the 210--Fair Oaks, Marengo, Los Robles, El Molino, and Lake Ave--are hostile to pedestrians and cyclists because of high traffic volumes and generally uninteresting building facades or parking lots that are oriented to cars, not people.

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Walnut & Madison

PARSONS AREA



Walnut & N Fair Oaks – Looking North. This parcel is within 500 ft. of the 210 Freeway and should be designated for commercial, not residential development. The Residence Inn proposed for the right side of this parcel is acceptable (if the design for the ground floor is modified to better engage pedestrians) but not ideal.



Parsons lot at Walnut & Fair Oaks – The proposed project for this single site would consume 1/3 of the 20-year development level for the entire Central District, unless the development levels are increased per our recommendation.

TRANSFORMATIONS TO OUR NEIGHBORHOOD
ARE LESS THAN HALF-WAY COMPLETE



Walnut & Raymond – Midblock, looking NW toward St Andrews. Marston's is to the right; Memorial Park is across the street.

LAKE AVE AREA



Lake & Colorado – Midblock, looking east.



TRANSFORMATIONS TO OUR NEIGHBORHOOD ARE LESS THAN HALF-WAY COMPLETE

Lake & Union – Looking South towards Colorado Blvd. This pedestrian-hostile route is the one that Gold Line riders who use the Lake Ave station are forced to endure.



Lake & Walnut – Looking West. These single-story shops are pedestrian-orientated and engage the sidewalk correctly but, since they are near the Lake Ave Gold Line station and are not architecturally significant buildings, they could be replaced with or adapted into multi-story mixed-use buildings that would add residents or workers who would generate more activity on the sidewalks, and yield greater benefits to the city.



Lake & Walnut – Looking east (top) and north (bottom). The Ralphs grocery store is an important amenity for the neighborhood, but the large surface parking lot that faces the sidewalk is oppressive.

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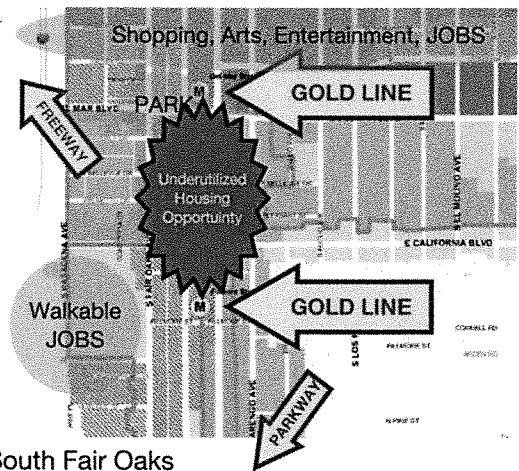
SOUTH FAIR OAKS / CENTRAL PARK / ARROYO PARKWAY / RAYMOND AREA



Arroyo Parkway & Pico – The strip malls that line Arroyo Parkway should be replaced with multi-story mixed-use buildings.

The incredible potential of South Fair Oaks Situated between two closely-spaced Gold Line stations, Fillmore and Del Mar, and with easy on/off access to both the 110 Freeway and the 134/210 Freeways, the South Fair Oaks / Central Park / Arroyo Parkway / Raymond corridor is the area of Pasadena (and perhaps the entire San Gabriel Valley) that is most connected to the entire Southern California transportation network.

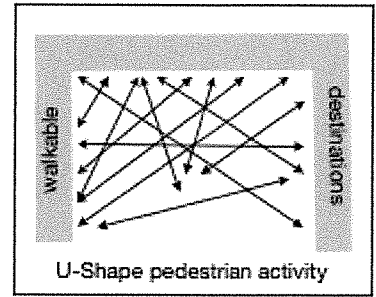
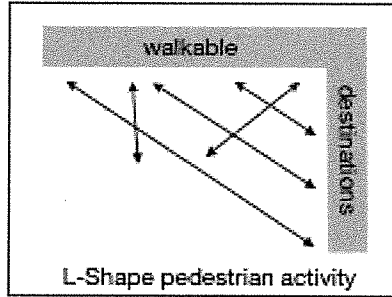
In addition, it is surrounded by Trader Joes, Whole Foods, Vons, Huntington Hospital, and a host of other neighborhood amenities, with Central Park, Del Mar Station, and Old Pasadena directly to the North. Furthermore, the South Fair Oaks/Central Park/Arroyo Parkway/Raymond corridor has many vacant and underutilized properties, with some key historic buildings (i.e. Royal Laundry, antique stores, the Union Garage Building/former Maserati dealership), which provide great infrastructure for creative development and reinvestment. And, poor air quality is not a concern, since the freeway access points are both terminal and therefore do not generate freeway-quantities of smog. Therefore, this corridor is a prime location for residential living.



While there is potential with the right planning and investors, currently SFO comes nowhere near its full potential, especially with respect to attracting higher level of use by residents & visitors. The existing self-storage, cold storage, antique shops, and low-density office & industrial buildings, of great opportunity for adaptive reuse and re-imagining. The “suburban” strip-malls need to be completely reconfigured or demolished, offering opportunities for the highest density. If this area were filled with high quality, higher-density residential properties (for all income and demographics) and workers, that would generate positive economic benefits and pedestrian street life that would benefit all of Downtown Pasadena, with fewer negative impacts than if growth were placed elsewhere.

TRANSFORMATIONS TO OUR NEIGHBORHOOD ARE LESS THAN HALF-WAY COMPLETE

Why South Fair Oaks and the Central District are inter-related. Creating more “walkable destinations” in South Fair Oaks would transform the primary commercial zones in Downtown Pasadena from an “L-shape” (Colorado Blvd + Lake Ave) to a “U-shape” (Arroyo Pkwy/Fair Oaks + Colorado + Lake Ave). A U-Shape promotes pedestrian street life by providing “destinations” in all directions, rather than in an L-shape. The activity created by residents & workers who would likely walk up Raymond Ave in order to get to destinations within Old Pasadena, would be particularly beneficial to Central Park, which currently feels deserted and unsafe at night.



Arroyo Parkway & Fillmore – Prime location for very-high-density mixed-use residential/office, as this location is literally <100 feet from the Fillmore Gold Line Station. FARs should be increased to 3.0.



Arroyo Parkway & Del Mar—The retail establishments storefronts should be brought to the sidewalk, with 5+ stories of offices or residential units above. Activating the pedestrian traffic on the Arroyo Parkway sidewalks should encourage the ground-floor units of the former-Archstone complex, which were intended to be “Live/Work” units to actually be used as such (with attorneys/CPAs/other professionals hanging a ‘shingle’ outside their units and inviting walk-in traffic). This may also be an opportunity to re-design this project, which is now acknowledged to have many design flaws.

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Arroyo Parkway & Cordova—A pedestrian & bike right-of-way/easement should be created between Arroyo Parkway and Raymond Ave, at Cordova, since Cordova is being designated as bike thoroughfare, so that pedestrians & cyclists can go directly into Central Park, rather than making a detour down to Del Mar or up to Green Street. The Public Storage building offers a great opportunity for adaptive re-use and a higher use (an addition of upper floor residential, creative office space, or flex space). Its current use is a poor use of land in our urban core, which is so close to the activity in Old Pasadena and the public amenity of Central Park. We must incentive change on these parcels.



Arroyo Parkway & California—Pasadena should prepare for a future in which people may have to ration resources in ways that are very different than the era of cheap and abundant fossil fuels. The rise in gas prices and advent of the electric car will likely free up many busy intersections as fewer gas stations are needed. It also seems possible that automated/driverless cars may become commonplace over the next 20 years, the lifespan of the General Plan. Driverless cars could have a radical impact on our land use, because the ability to “whistle” for a car at the time of need will greatly decrease the need for large parking lots. Changes in Energy Supply/Demand plus Technology advances all point to more compact land use than we currently have.

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For further reading on driverless cars and the implications for land use, please see:

- The Atlantic: *"Driverless Cars Would Reshape Automobiles *and* the Transit System"*
<http://www.theatlantic.com/technology/archive/2012/09/driverless-cars-would-reshape-automobiles-and-the-transit-system/262953/#>
- Robocar Parking: <http://www.templetons.com/brad/robocars/parking.html>



Arroyo Parkway & California—FARs should be increased to 3.0.



Raymond Ave & California—FARs should be increased to 3.0.



Raymond Ave & California—Looking north. At the right of the photo is the Disney Story/Royal Laundry building. The U-Haul lot and storage facility is across the street.

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Raymond Ave & California—Looking south. FARs should be increased to 3.0.

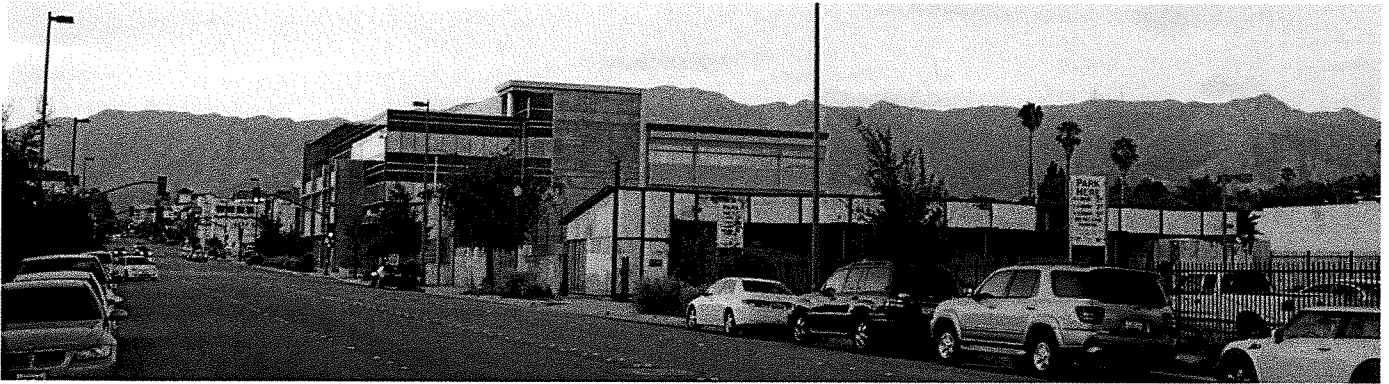


Raymond Ave & California—Looking east.

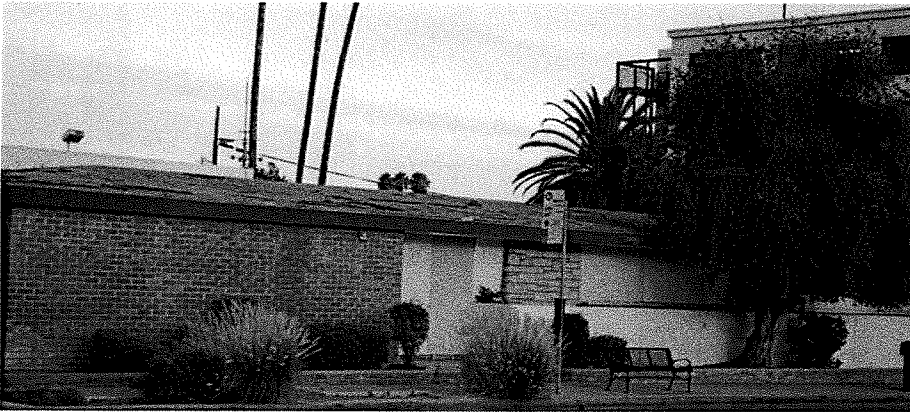


Raymond Ave—South of California. Despite being adjacent to the Fillmore Gold Line station, these properties are industrial. The “Bio-Tech” vision of the last several decades never emerged.

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Raymond Ave—Looking north from Fillmore Ave.



Raymond Ave—This dilapidated property is immediately adjacent to the Fillmore station.



Fillmore Ave—Facing S Fair Oaks Ave.

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Fair Oaks—The Playfair lot and adjoining property which face S Fair Oaks Ave.



Fair Oaks—Burger King facing Fair Oaks. North of this property is the former Monty's (now a parking lot) and Grandview Palace, which will likely be a medical office building at some point.

TRANSFORMATIONS TO OUR NEIGHBORHOOD
ARE LESS THAN HALF-WAY COMPLETE

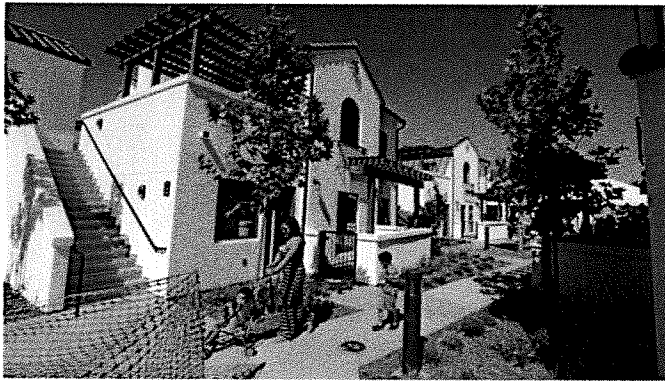
APPENDIX B

Recent news articles on Greater Los Angeles' Housing affordability crisis, in relation to the supply of market-rate housing

Opinion / Op-Ed



Op-Ed Easing L.A.'s housing crunch



Residents take a stroll through their new complex as city and state officials gather in Vernon on July 25 to celebrate the grand opening of the Vernon Village Park Apartments, a private 45-unit affordable housing development. (Los Angeles Times)

By PAUL HABIBI

This article is related to: Commentary, Opinion, Public Transportation, Apartments/Homes Housing and Urban Planning, Economic Inequality

AUGUST 10, 2015, 5:09 AM

Los Angeles is stuck in a housing crisis with little hope for an easy escape. The standard definition of “affordable” is shelter that costs no more than 30% of a household’s gross income; anything higher cuts severely into other types of consumption. Using that metric, to afford the median-priced home, the median household would require a staggering 52% raise, to

\$96,000 a year from \$63,000. A more modest 14% raise would enable that family to rent the median-priced apartment. With housing costs rising faster than incomes, we are likely to retain our title as the least affordable city in the United States for years to come.

Paul Habibi is principal of Grayslake Advisors, a real estate expert services firm, and a lecturer at the UCLA Anderson School of Management and the UCLA Law School.

Why is our housing stock unaffordable? Supply-and-demand imbalances. Although the local economy has made progress since the Great Recession, real wage growth has been tepid. Moreover, we are not a hotbed of high-paying industries.

Affordable housing is not just a concern for those living in substandard accommodations. It threatens the economic vitality of the entire state. As shelter becomes more unaffordable, working families depart the city and fewer jobs come to California — a vicious negative feedback loop.

According to the California Housing Partnership Corp., Los Angeles County needs almost 500,000 more units that are affordable to households earning less than 50% of the area median income. Developers build less than 3% of this number annually.

In June, the California Supreme Court ruled that cities can require the inclusion of affordable units in for-sale projects. Although this decision gives local government more tools to create affordable housing, it may well push developers to build elsewhere, if at all.

Why is our housing stock unaffordable? Supply-and-demand imbalances

Rather than using economic “sticks,” we need more “carrots” to incentivize the private sector.

Halting housing construction is no answer to California's drought



Sprawl, as such, is not the cause of California's water restrictions in the drought. (Staff photo by Leo Jarzomb)

By The Editorial Board, *The Pasadena Star-News*

POSTED: 07/03/15, 12:46 PM PDT

0 COMMENTS

Perhaps it's human nature, when a person is concerned about one big problem, to apply answers to entirely other problems through the filter of the main concern.

That is certainly what many Southern Californians concerned about excess population growth are doing when it comes to the West's ongoing drought.

Here we are, they say, after four dry rainy seasons, with the governor imposing restrictions on everyone in the state — residential and commercial, agricultural and recreational — aimed at cutting back by 25 percent, and still we are allowing the building of new homes and businesses!

They say it in the grocery-store lines, around the office ... well, water cooler, and in many different ways in their letters to the editor.

The two-facedness, say our fellow Californians, is simply outrageous. They see a complete disconnect between a government that on the one hand is enforcing the strictest cutbacks ever in how much water we have access to and on the other refuses to simply put a moratorium on building permits. So

long as the state continues to run dry, they say, how can we add more construction that seems to put up a welcome sign aimed at adding more users of water to the 40 million people here already?

The concern is understandable, and yet, as with many such common wisdoms, it is wrong, when viewed as part of the state's true water-use picture. Residential water use is a drop in the bucket. Not that it would be a very good idea at all, but if we covered most of the state's vast open spaces with homes instead of growing agricultural hay, we'd use less water than we do now.

The rest of the nation has always been interested in most things Californian, and *The New Yorker's* staff writer in Los Angeles, Dana Goodyear, recently contributed an extraordinary piece on the dying Salton Sea vis a vis our drought. In it, she noted that in order to save the state-mandated million and a half acre feet of water a year, Californians must forgo "long showers, frequent laundering, toilet-flushing, gardening, golf." Letter-writer Thomas Sittler of Foster City in the Bay Area responded by noting that California alfalfa-growing alone — much of which is exported to China and the Mideast to feed their cattle — uses 5.2 million acre feet a year, "or the equivalent of about a hundred billion showers."

A hundred billion? That ain't hay. So, clearly, building new condominiums, in relative terms, has almost nothing to do with the water-supply problem in California.

Our cities need more housing, not less, as part of the solution to the supply-and-demand economics that has made houses and apartments unaffordable to too many of us

Slow-growth and population-control advocates need to instead sustain their arguments on their own merits rather than by bringing water into the picture.

Especially in terms of suburban sprawl in Southern California, with its deleterious effects on freeway gridlock, air quality and workers' time with their families, the case can be made that we need to stop expanding our megalopolis.

But our cities need more housing, not less, as part of the solution to the supply-and-demand economics

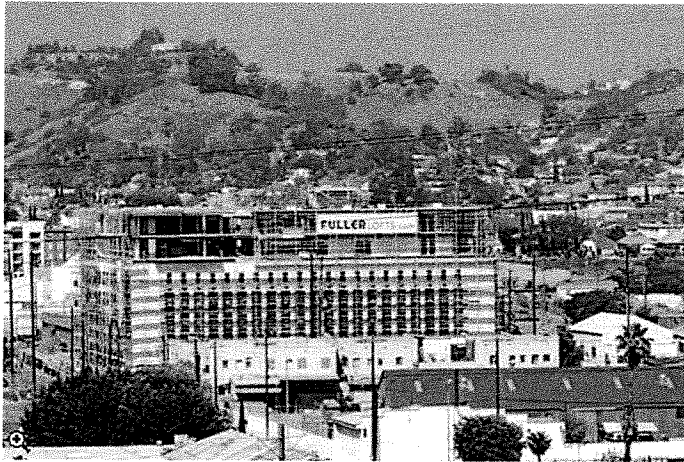
that has made houses and apartments unaffordable to too many of us, and to help solve the tragedy of tens of thousands sleeping on the streets each night. Smart growth — more multi-family, closer to transit — rather than no growth is still the best policy for California as we await some blessed rain.



How Much Does Los Angeles Have to Build to Get Out of Its Housing Crisis?

Wednesday, March 18, 2015, by Bianca Barragan

California is a beautiful and desirable place to live, but it's also one of the hardest places to afford to live. Los Angeles is particularly brutal: it's got the **biggest disconnect** between incomes and rents of

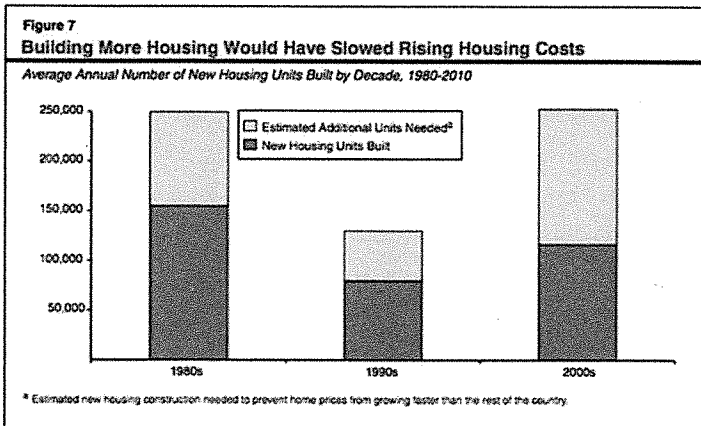
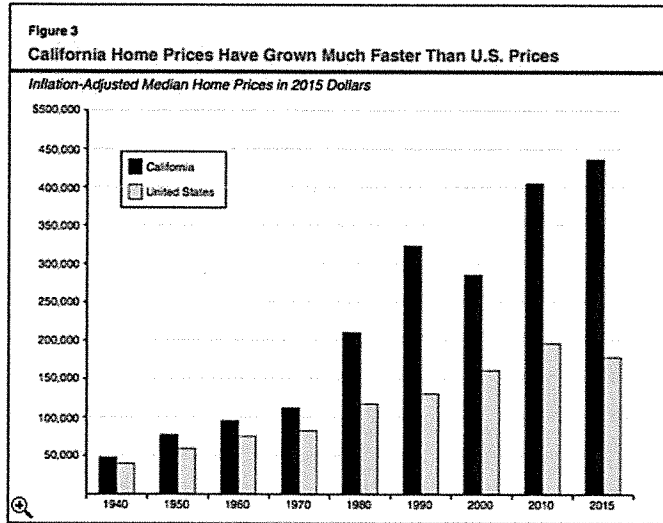


anywhere in the nation, and it's the place to be if you're looking to have your dreams of homeownership **crushed**. Is there any hope? A **new report out from the Legislative Analyst's Office** shows that the groundwork for LA's housing shortage was laid a long time ago, and it's going to be hard work undoing it.

In order to keep housing prices in check, California overall would have had to build more (70,000 to 110,000 additional units each year), build denser, and build especially in the coastal areas (including Los Angeles) and central cities (as opposed to building mostly inland and in areas way outside of cities as has been done in the past). California also should have been doing this for decades already. Because it didn't, "the state probably would have to build as many as 100,000 additional units annually—almost exclusively in its coastal communities—to seriously mitigate its problems with housing affordability." And that's in addition to the 100,000 to 140,000 units that the Golden State is already planning to build.

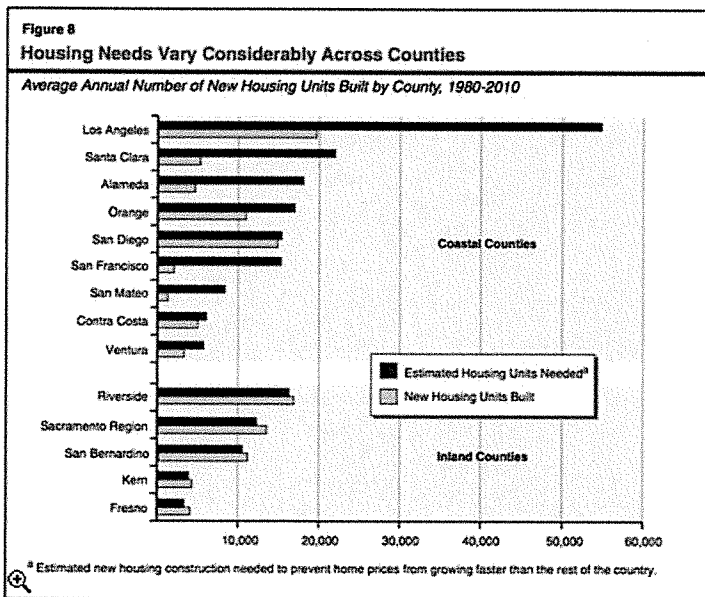
If the state had done all that, California's housing prices still would have continued to grow and would still be higher than the rest of the country's now, but the disparity between them would have been less gaping. If California had done all that, the report says, the 2010 state median housing price would have been a solid 80 percent higher than the US median, instead of 200 percent higher, which is what actually happened.

While Los Angeles County built the most out of any California county in the years between 1980 and 2010, it was waaaay less than it needed to keep housing prices from getting ridiculous. For comparison, in the same 30-year period, "the number of housing units in the typical U.S. metro grew by 54 percent, compared with 32 percent for the state's coastal metros. Home building was even slower in Los Angeles and San Francisco, where the housing stock grew by only around 20 percent." Okay, so California's not building like the rest of the country, but maybe that's just our thing, like surfing or juice cleansing. Maybe it's too chill to build. FALSE. The report says that during another 30-year period, from 1940 to 1970, "the number of



housing units in California's coastal metros grew by 200 percent."

So, why isn't the state building like we used to? One familiar reason is NIMBYs. The report notes that, while it is important that local residents have input on new housing, their resistance to new development is "heightened" especially in coastal California, and it's slowing down the ability of developers to build more housing to alleviate the stress on the limited housing supply. CIM Group's Sunset/Gordon project, which took out the Old Spaghetti Factory, is used as an example of a project challenged by the community. (The project was not explicitly named, but the timeline and details are exact matches.) As the result of a lawsuit, that project had its permits revoked after it was finished and tenants had already moved in. It's unclear what will happen to it.



New housing projects are also slowed by the length of time it takes for approvals. The average coastal California metro takes seven months to approve a project; in LA, it takes about eight months. The average for major US metros was just four and a half months. The longer it takes for a project to get built, the more expensive the project becomes. Adding to that time is the review mandated under the California Environmental Quality Act, which

offers "opportunities" for those who oppose a project to really drag things out.

In order to keep housing prices in check, California overall would have had to build more (70,000 to 110,000 additional units each year), build denser, and build especially in the coastal areas (including Los Angeles) and central cities (as opposed to building mostly inland and in areas way outside of cities as has been done in the past). California also should have been doing this for decades already. Because it didn't, "the state probably would have to build as many as 100,000 additional units annually—almost exclusively in its coastal communities—to seriously mitigate its problems with housing affordability."

Unfortunately, the LAO doesn't foresee a drop-off in resistance to growth in coastal communities, nor do they really see major policy shifts on the horizon. And since "increasing competition for limited housing is the primary driver of housing cost growth in coastal California," they predict that exorbitantly expensive housing in coastal communities and the state will probably continue growing at the same scary rate in the future. However, the recommendation of the report was pretty simple: "to contain rising housing costs, California would have to build significant[ly] more housing, especially in coastal urban areas." Doing this, and on the scale the state needs it, will be "extremely difficult," the report acknowledges, but it's basically the only thing that's going to make a dent in the housing crisis.



BUNGALOW HEAVEN™ NEIGHBORHOOD ASSOCIATION

13 AUG 17 09:54 AM
CITY CLERK

August 16, 2015

Members of the City Council and Staff
City of Pasadena
c/o Mark Jomsky, City Clerk

Dear Mayor Tornek and City Council Members,

As president of the Bungalow Heaven Neighborhood Association, I would like express the neighborhood's great appreciation to the City of Pasadena's staff for their years of work to create the proposed Mobility Elements, Land Use Elements and Final Environmental Impact Report of the General Plan Update. We are also grateful for the opportunities provided at workshops and commission meetings to voice our concerns as fellow citizens and neighbors of Pasadena's first historic landmark district.

On March 20, 2015, BHNA submitted a 12 page comment letter to which we addressed concerns regarding the Draft versions of the EIR, Land Use Element, and Mobility Element. Staff's 15 page public response was provided in the Final EIR under Section 3, A-1.

Although we commented on many facets of the General Panel Update, our largest concern dealt with the designation of North Lake Avenue between E. Mountain St. and E. Washington Blvd. as Low Mixed Use and Medium Mixed Use described on the Land Use Diagram. We concluded that due to SB 1818, this designation has the potential to negatively impact the aesthetic and historic resource of our historic neighborhood, specifically N. Mentor Ave. Therefore, we requested that the proposed land use designation change to low density commercial use to insure that the height and development standards of future structures remain consistent with City height limits and avoid the possibility of concessions to developers. City staff did not concur with our views.

That said, Bungalow Heaven is appreciative of the addition of Item 36.5 Transitional Heights and Setbacks added into Section 1: Land Use Element Goals and Policies under North Lake. This addition provides restrictions on the number of stories of a project and the requirement for appropriate setbacks. As a reply, we suggested at the July 22 meeting of the Planning Commission that the possible inclusion of elements from City Code 17.40.160 - Setback and Encroachment Plane Requirements and Exceptions might provide additional clarity and protection.

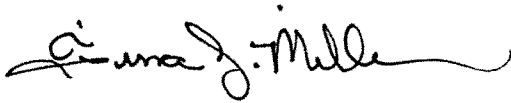
36.5 Transitional Heights and Setbacks. *Protect adjacent Low and Low-Medium residential areas north of Orange Grove Boulevard, which contain a number of locally and nationally recognized historic properties and districts, from the development of mixed use or residential projects by requiring appropriate transitional heights. Mixed use or residential projects proposed in these locations shall be limited to no more than three stories in height for those portions of the project abutting commercial*

streets, stepping down to no more than two stories in height abutting the Low and Low-Medium residential areas. Appropriate setbacks shall also be established in order to provide further protection.

In conclusion, Bungalow Heaven still remains firm in our request for low density commercial use on N. Lake Ave. BHNA will remain steadfast in our participation in the City process in order to work toward a positive future for the N. Lake area and the residents of Bungalow Heaven.

Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "Tina Miller". The signature is fluid and cursive, with a long horizontal flourish extending to the right.

Tina Miller
President of Bungalow Heaven Neighborhood Association
president@bungalowheaven.org
tmpasadena@aol.com

CC:
Mayor Terry Tornek
City Manager Michael J. Beck
Director of Planning Vincent Bertoni
Senior Planner V. Chima

August 15, 2015

Pasadena City Council
175 N. Garfield Ave.
Pasadena, CA 91101

15 AUG 17 09:54 AM
CITY CLERK



RE: Public Health Implications of General Plan Alternatives, Land-Use Siting, and Mobility Elements

Dear Mayor Tornek and Members of the Pasadena City Council,

Day One is a Pasadena-based non-profit organization with over two decades of experience in the realm of public health education, policy and environmental prevention. As such, Day One is actively interested in planning and land-use decisions that affect the health and well-being of residents of the City of Pasadena.

First and foremost, Day One would like to thank all involved with the development of the General Plan. We recognize the update process has been an exhaustive effort on the part of City staff, leaders, and community stakeholders. As you consider final approval of the plan, Day One would like to highlight the public health implications of future development in the City, in particular freeway-adjacent residential housing.

Health Risks of Freeway-Adjacent Housing

Encouraging "transit-oriented development" (or TOD) is generally a good idea – greater use of public transit is associated with higher rates of healthy "active transportation" (i.e., walking, biking). However, concentrating development along highways is increasingly viewed by the scientific community as a recipe for poor health.

Why? Residents of housing near busy freeways are exposed to significantly higher levels of air pollution than those who reside only a few blocks away. In a landmark 2004 Children's Health study, USC researchers found that children who live within 500 feet of a freeway – about one block – contracted asthma at higher levels. Since then a growing body of research has found that those who live adjacent to freeways are at higher risk for impaired lung development, stroke, heart disease, and cancer. Other researchers discovered that proximity to freeways increases expectant mothers' risk for premature birth, as well as having children with autism.

Mitigating Negative Externalities of Freeway-Adjacent Housing

The siting of the Foothill Gold Line in the middle of the 210 freeway over a decade ago was a huge mistake from a safe access, user comfort, TOD potential, and public health perspective. Transit users at these stations literally have to stand in the middle of a loud, truck-filled freeway exposed the worst localized pollution in order to access light rail.

Unfortunately addressing these problems is not easy. While tree buffers and building siting (e.g., orienting windows away from the pollution source) can help reduce air pollution, fine particles created by car exhaust, tire rubber, and brake dust, just like tobacco smoke, still find their way through windows, cracks, ventilation systems and even the best air filtration systems. Even closed, triple-paned windows do not keep the pollution out; even if they could, residents should not be expected to live in a vacuum, unable to open windows and doors without undue exposure to harmful localized air pollution.

There is already a surfeit of freeway-adjacent housing in Pasadena, and the large multi-family complexes lining parts of the 210 are not going anywhere. The question is where the City should encourage future growth. If we listen to the science, it's clear that placing residents, especially children, close to the 210 freeway is a recipe for poor health.

In 2011, city leaders recognized drifting tobacco smoke as a serious danger to public health and banned smoking in apartments and condominiums. This choice should be far easier. Air pollution from freeways, like tobacco smoke, can't be easily contained. City leaders and staff should acknowledge the science and embrace a final General Plan that limits further housing density within 500 feet of a freeway, as the California Air Resources Board (CARB) recommends in its 2005 Air Quality and Land Use Handbook.

08/17/2015
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Recommendations

1. Restrict additional residential housing within at least 500 feet (about one city block) of the 210 freeway to create a buffer from localized freeway pollution, and require landlord disclosure to prospective and current renters whose units lie within this zone.
2. Require housing and other sensitive uses within 1500 feet of a freeway adhere to current best-practice mitigation measures to reduce exposure to air pollution, which may include the use of air filtration to enhance heating, ventilation and air conditioning (HVAC) systems, and the orientation of site buildings and placement of outdoor facilities designed for moderate physical activity as far from the emission source as possible.
3. Increase proposed FAR and residential unit caps in the South Fair Oaks District to encourage the development of mixed-use housing around the pedestrian-friendly Gold Line Fillmore and Del Mar stations (two of only 3 Pasadena stations not located in the middle of the 210 freeway).
4. Promote living arrangements that facilitate active transportation by increasing proposed residential and commercial development levels in the Central District (where additional pedestrian-, bike- and transit-friendly development and centrally-located, affordable housing is ideal) and requiring the use of best practices in reducing VMT for such developments (e.g., limited on-site parking, decoupled parking, complementary transit passes, on-site car and bicycle share, etc.).

As you finalize the General Plan, Day One urges you to carefully consider the health and well-being of future generations. Enclosed you will find additional, germane information from the California Air Resources Board, Los Angeles County Department of Health, and other sources regarding the above-outlined issues and recommendations.

Thank you for your time and consideration,



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Attachments

Day One, Inc.

Pasadena City Council Public Comment (8/17/2015)

Recommendations for Freeway Adjacent Land Use

Los Angeles County Department of Public Health
Bureau of Toxicology and Environmental Assessment

Below information courtesy of Cyrus Rangan, M.D. FAAP ACMT, Director, Bureau of Toxicology and Environmental Assessment LA County Department of Public Health, (213) 738-3220, crangan@ph.lacounty.gov

1. The following land use guidelines are currently used to address near roadway air quality issues:

- SCAQMD: Air Quality Issues Regarding Land Use Guidance Document; Chap 2, (aqmd.gov); 1-800-288-3186
- Bay Area Air Quality Management District; CEQA Air Quality Guidelines, 2011 (baaqmd.gov); 415-749-5000
- CARB (California Air Resources Board), ARB Handbook, 2005 (arb.ca.gov); 1-800-363-7664 or 866-397-5462

2. Specific recommendations for the reduction of particulate matter in residential units:

- Fisk, Performance & Costs of Particulate Air Filtration in HVAC Supply Airstreams; 1/6/2003
- Rivard, Assessment & Mitigation of Air Pollutant Health Effects from Intra-urban Roadways: Guidance for Land Use Planning & Environmental Review, City of San Francisco, 5/6/2008
- BAAQMD, CEQA Air Quality Guidelines, May 2011

3. Based on this large body of scientific evidence, the air quality considerations lead us to recommend:

- ***A buffer of at least 500 feet should be maintained between the development of new schools, housing or other sensitive land uses and freeways. Consideration should be given to extending this minimum buffer zone based on site-specific conditions, given the fact that unhealthy traffic emissions are often present at greater distances. Exceptions to this recommended practice should be made only upon a finding by the decision-making body that the benefits of such development outweigh the public health risks.***
- **New schools, housing or other sensitive land uses built within 1500 feet of a freeway should adhere to current best-practice mitigation measures to reduce exposure to air pollution, which may include: the use of air filtration to enhance heating, ventilation and air conditioning (HVAC) systems, and the orientation of site buildings and placement of outdoor facilities designed for moderate physical activity as far from the emission source as possible.**
- Parks and recreational facilities provide great benefits to community residents including increased levels of physical activity, improved mental health, and opportunities to strengthen social ties with neighbors.[i]However, siting parks and active recreational facilities near freeways may increase public exposure to harmful pollutants, particularly while exercising. Studies show that heavy exercise near sources of traffic pollution may have adverse health effects.[iv] , [v], [vi] However, there are also substantial health benefits associated with exercise.[vii] Therefore, DPH recommends the following cautionary approach when siting parks and active recreational facilities near freeways:
- **New parks with athletic fields, courts, and other outdoor facilities designed for moderate to vigorous physical activity, should be sited at least 500 feet from a freeway. Consideration should be given to extending this minimum buffer zone based on site-specific conditions given the fact that unhealthy traffic emissions are often present at greater distances. Exceptions to this recommended practice should be made only upon a finding by the decision-making body that the benefits of such development outweigh the public health risks.**

- New parks built within 1500 feet of freeways should adhere to best-practice mitigation measures that minimize exposure to air pollution. These include the placement of athletic fields, courts, and other active outdoor facilities as far as possible from the air pollution source.

[i] L. Frank et al. 2005. Linking Objectively Measured Physical Activity with Objectively Measured Urban Form: Findings From SMARTRAQ. *American Journal of Preventive Medicine*, at 117-1255.

[ii] Tabbush R and E O'Brien. 2003. *Health and Well-being: Trees, Woodlands, and Natural Spaces*. Forestry Commission, Edinburgh.

[iii] E. Kuo et al. 1998. Transforming Inner-City Neighborhoods: Trees, Sense of Safety, and Preference. *Environmental Behavior*. 30(1): 28-59.

[iv] McConnell R, Berhane K, Gilliland F, London SJ, Islam T, Gauderman WJ, Avol E, Margolis HG, Peters JM. Asthma in exercising children exposed to ozone: a cohort study. *Lancet*. 2002 Feb 2;359(9304):386-91.

[v] Sharman JE, Cockcroft JR, and JS Coombes. Cardiovascular implications of exposure to traffic air pollution during exercise. *Q J Med* 2004; 97:637-643.

[vi] Rundell KW, Caviston R, Hollenbach AM, and K Murphy. Vehicular Air Pollution, Playgrounds, and Youth Athletic Fields. 2006, Vol. 18, No. 8 , Pages 541-547.

[vii] de Hartog JJ, Boogaard H, Nijland H, and G Hoek. Do the Health Benefits of Cycling Outweigh the Risks? *Environmental Health Perspectives*. 2010; 118(8): 1109-1116.

The above guidelines, references, and recommendations include construction, engineering controls, operational mitigation measures and disclosure statements to prospective occupants. And, again, these recommendations are based primarily on the air quality issues.

**California Air Resources Board – Air Quality and Land Use Handbook:
A Community Health Perspective (2005)**

Below pasted excerpt from “Freeways and High Traffic Roads” Section; pages 8-10 (19-21 in document)

“The data on the effects of proximity to traffic-related emissions provides additional information that can be used in land use siting and regulatory actions by air agencies. The key observation in these studies is that close proximity increases both exposure and the potential for adverse health effects. Other effects associated with traffic emissions include premature death in elderly individuals with heart disease.

Key Health Findings

- Reduced lung function in children was associated with traffic density, especially trucks, within 1,000 feet and the association was strongest within 300 feet. (Brunekreef, 1997)
- Increased asthma hospitalizations were associated with living within 650 feet of heavy traffic and heavy truck volume. (Lin, 2000)
- Asthma symptoms increased with proximity to roadways and the risk was greatest within 300 feet. (Venn, 2001)
- Asthma and bronchitis symptoms in children were associated with proximity to high traffic in a San Francisco Bay Area community with good overall regional air quality. (Kim, 2004)
- A San Diego study found increased medical visits in children living within 550 feet of heavy traffic. (English, 1999)

In these and other proximity studies, the distance from the roadway and truck traffic densities were key factors affecting the strength of the association with adverse health effects. **In the above health studies, the association of traffic related emissions with adverse health effects was seen within 1,000 feet and was strongest within 300 feet. This demonstrates that the adverse effects diminished with distance.**

In addition to the respiratory health effects in children, proximity to freeways increases potential cancer risk and contributes to total particulate matter exposure. There are three carcinogenic toxic air contaminants that constitute the majority of the known health risk from motor vehicle traffic – diesel particulate matter (diesel PM) from trucks, and benzene and 1,3-butadiene from passenger vehicles. On a typical urban freeway (truck traffic of 10,000-20,000/day), diesel PM represents about 70 percent of the potential cancer risk from the vehicle traffic. Diesel particulate emissions are also of special concern because health studies show an association between particulate matter and premature mortality in those with existing cardiovascular disease.

Distance Related Findings

A southern California study (Zhu, 2002) showed measured concentrations of vehicle-related pollutants, including ultra-fine particles, decreased dramatically within approximately 300 feet of the 710 and 405 freeways. Another study looked at the validity of using distance from a roadway as a measure of exposure to traffic related air pollution (Knape, 1999). **This study showed that concentrations of traffic related pollutants declined with distance from the road, primarily in the first 500 feet.**

These findings are consistent with air quality modeling and risk analyses done by ARB staff that show an estimated range of potential cancer risk that decreases with distance from freeways. The estimated risk varies with the local meteorology, including wind pattern. As an example, at 300 feet downwind from a freeway (Interstate 80) with truck traffic of 10,000 trucks per day, the potential cancer risk was as high as 100 in one million (ARB Roseville Rail Yard Study).

The cancer health risk at 300 feet on the upwind side of the freeway was much less. The risk at that distance for other freeways will vary based on local conditions – it may be higher or lower. However, in all these analyses the relative exposure and health risk dropped substantially within the first 300 feet.

State law restricts the siting of new schools within 500 feet of a freeway, urban roadways with 100,000 vehicles/day, or rural roadways with 50,000 vehicles with some exceptions. However, no such requirements apply to the siting of residences, day care centers, playgrounds, or medical facilities. The available data shows that exposure is greatly reduced at approximately 300 feet. In the traffic-related studies the additional health risk attributable to the proximity effect was strongest within 1,000 feet.

The combination of the children's health studies and the distance related findings suggests that it is important to avoid exposing children to elevated air pollution levels immediately downwind of freeways and high traffic roadways. **These studies suggest a substantial benefit to a 500-foot separation.** The impact of traffic emissions is on a gradient that at some point becomes indistinguishable from the regional air pollution problem. As air agencies work to reduce the underlying regional health risk from diesel PM and other pollutants, the impact of proximity will also be reduced. In the meantime, as a preventative measure, we hope to avoid exposing more children and other vulnerable individuals to the highest concentrations of traffic-related emissions.

Recommendation

- **Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.**

References

- Brunekreef, B. et al. "Air pollution from truck traffic and lung function in children living near motorways." *Epidemiology*. 1997; 8:298-303
- Lin, S. et al. "Childhood asthma hospitalization and residential exposure to state route traffic." *Environ Res*. 2002;88:73-81
- Venn. et al. "Living near a main road and the risk of wheezing illness in children." *American Journal of Respiratory and Critical Care Medicine*. 2001; Vol.164, pp. 2177-2180
- Kim, J. et al. "Traffic-related air pollution and respiratory health: East Bay Children's Respiratory Health Study." *American Journal of Respiratory and Critical Care Medicine* 2004; Vol. 170. pp. 520-526
- Zhu, Y et al. "Study of Ultra-Fine Particles Near A Major Highway With Heavy- Duty Diesel Traffic." *Atmospheric Environment*. 2002 ; 36:4323-4335
- Knape, M. "Traffic related air pollution in city districts near motorways." *The Science of the Total Environment*. 1999; 235:339-341
- *Roseville Rail Yard Study*. ARB (October 2004)
- *ARB Diesel Risk Reduction Plan*. (2000)
- Delfino RJ "Epidemiologic Evidence for Asthma and Exposure to Air Toxics: Linkages Between Occupational, Indoor, and Community Air Pollution Research." *Environmental Health Perspectives*. (2002) 110 (supplement 4): 573-589
- English P., Neutra R., Scalf R. Sullivan M. Waller L. Zhu L. "Examining Associations Between Childhood Asthma and Traffic Flow Using a Geographic Information System." (1999) *Environmental Health Perspectives* 107(9): 761-767

Quotes and Contact Information for Additional Experts in Field

1) Dr. Rob McConnell, Associate Professor of Preventive Medicine, USC Keck School

Co-principal investigator for the Community Intervention Project on Childhood Asthma

- “putting high density residential development adjacent to a freeway is a bad idea. It will make people sick. Buffer zone is a good policy. 500 feet is a defensible number.”
- Possibility of increased cardiovascular benefits of a couple block walk to transit stations

Rob S. McConnell

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Keck School of Medicine
Co-principal Investigator, Community Intervention Project on Childhood Asthma
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Expertise:

- helping urban children with asthma via community-based interventions to control exposure to dust mites and other indoor antigens
- measuring the efficacy of educational programs in environmental health
- evaluating the effects of air pollution on childhood respiratory health
- epidemiology - design and analysis of studies relating health outcomes to environmental exposures

2) Dr. Joseph K. Lyou, President & CEO, Coalition for Clean Air, Governor’s Appointee, South Coast Air Quality Management District Governing Board

- “The data from air quality research studies do suggest that a buffer zone is a good idea. The exposure difference can be significant given even an extra few hundred feet of separation between air pollution sources, such as freeways, and residents.”

Joseph K. Lyou, Ph.D.

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Sample Media Articles on the Issue

People Living or Working Near Major Freeways Are Exposed to 30 Times the Concentration of Dangerous Particles From Motor Vehicle Emissions

UCLA NEWS <http://www.scpcs.ucla.edu/news/ZhuHinds%20PR%20Oct02.pdf>

Oct. 17, 2002

People who live, work or travel within 165 feet downwind of a major freeway or busy intersection are exposed to potentially hazardous particle concentrations up to 30 times greater than normal background concentrations found at a greater distance, according to two recently published UCLA studies.

The studies — published in the Journal of the Air and Waste Management Association and in Atmospheric Environment — show that proximity to a major freeway or highway dramatically increases exposure to “ultrafine” particles (tiny particles less than 0.1 micrometers in diameter), which are linked to neurological changes, mild pulmonary inflammation and cardiovascular problems. The U.S. Environmental Protection Agency (EPA) currently regulates particles less than 2.5 micrometers in diameter, and ultrafines represent the very smallest particles inhaled by the public.

Study finds traffic pollution can speed hardening of arteries

People living within 328 feet of an L.A. freeway were found to have twice the average progression of atherosclerosis -- thickening of artery walls that can lead to heart disease and stroke.

February 14, 2010 | By Margot Roosevelt

<http://articles.latimes.com/2010/feb/14/local/la-me-freeway-pollution14-2010feb14>

Los Angeles residents living near freeways experience a hardening of the arteries that leads to heart disease and strokes at twice the rate of those who live farther away, a study has found.

The paper is the first to link automobile and truck exhaust to the progression of atherosclerosis -- the thickening of artery walls -- in humans. The study was conducted by researchers from USC and UC Berkeley, along with colleagues in Spain and Switzerland, and published this week in the journal PloS ONE.

Researchers used ultrasound to measure the carotid artery wall thickness of 1,483 people who lived within 100 meters, or 328 feet, of Los Angeles freeways. Taking measurements every six months for three years, they correlated their findings with levels of outdoor particulates -- the toxic dust that spews from tailpipes -- at the residents' homes.

They found that artery wall thickness in study participants accelerated annually by 5.5 micrometers -- one-twentieth the thickness of a human hair -- more than twice the average progression.

According to co-author Howard N. Hodis, director of the Atherosclerosis Research Unit at USC's Keck School of Medicine, the findings show that "environmental factors may play a larger role in the risk for cardiovascular disease than previously suspected."

UC Berkeley co-author Michael Jerrett noted that "for the first time, we have shown that air pollution contributes to the early formation of heart disease, known as atherosclerosis, which is connected to nearly half the deaths in Western societies. . . . By controlling air pollution from traffic, we may see much larger benefits to public health than we previously thought."

The study comes at a time of growing alarm over the effects of freeway pollution on nearby schools and homes. In the four-county Los Angeles Basin, 1.5 million people live within 300 meters, or 984 feet, of major freeways.

The Natural Resources Defense Council is battling in federal court to overturn the caps on motor-vehicle emissions set by Southern California air quality officials, saying that they fail to account for higher pollution near freeways.

And Los Angeles and Long Beach residents are fighting expansion of the truck-clogged 710 Freeway, saying it will lead to higher rates of asthma, heart disease and cancer in densely populated areas.

In July, the U.S. Environmental Protection Agency launched a major study of traffic pollution near Detroit roadways to examine whether it leads to severe asthma attacks in children.

More than a third of Californians report that they or a family member suffer from asthma or respiratory problems, according to a survey last year. The Obama administration is proposing tighter standards for two vehicle-related pollutants: nitrogen dioxide (NO2) and ground-level ozone, the chief component of smog.

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Living near a motorway hikes your risk of dying after a heart attack

By Daily Mail Reporter

PUBLISHED: 10:18 EST, 8 May 2012 | UPDATED: 01:48 EST, 9 May 2012

<http://www.dailymail.co.uk/health/article-2141330/Living-near-motorway-hikes-risk-dying-heart-attack.html#ixzz2EM4iT4o5>

Living close to a major road poses a significant risk to heart attack survivors, a study has found. Researchers found heart attack survivors living less than 100 metres from a carriageway had a 27 per cent higher risk of death within 10 years than survivors living at least 1,000 metres away.

The team from Beth Israel Deaconess Medical Center in Boston added that the risk receded to 13 per cent for those living between 200 and 1,000-metres from the traffic. Lead author Dr Murray Mittleman said: 'Living close to a highway is associated with adverse cardiovascular outcomes in those with underlying cardiac disease. 'Besides air pollution, exposure to noise could be a possible mechanism underlying this association.'

The study of more than 3,500 heart attack survivors in 64 medical centres recorded 1,071 deaths over 10 years. Of that total, 63 per cent of the patients died of cardiovascular disease, 12 percent died of cancer and four per cent died from respiratory disease. Researchers analysed factors such as personal, clinical and neighborhood-level characteristics such as income and education.

Dr Mittleman said: 'People with lower levels of education and income are more likely to live in communities closer to a major roadway, so they are bearing a larger burden of the risk associated with exposure than people with more resources.'

In a study published earlier this year, a team led by Dr Mittleman found air pollution, even at levels generally considered safe by federal regulations, increases the risk of stroke by 34 per cent. Exposure to ambient fine particulate matter, generally from vehicle traffic, was associated with a significantly higher risk of ischemic strokes on days when the EPA's air quality index for particulate matter was yellow instead of green.

These findings provide new evidence that long-term exposure to roadways is associated with an increased risk of death in patients with underlying cardiovascular disease. Writing in the latest edition of *Circulation* 'Clinicians need to educate their patients on the risks posed by particulate matter pollution and encourage patients with cardiovascular disease to avoid unnecessary exposure to traffic,' said Dr Mittleman.

'On a public policy level, city planners should consider locating housing developments away from the most heavily trafficked roadways.' Dan Costa from the U.S Environmental Protection Agency, said: 'This study adds to the growing knowledge linking roadways and traffic to health problems, even death, especially among those with pre-existent disease - in this case a previous heart attack.'

Proximity to freeways increases autism risk, study finds

More research is needed, but the report suggests air pollution could be a factor.

December 16, 2010 | By Shari Roan, Los Angeles Times

Children born to mothers who live close to freeways have twice the risk of autism, researchers reported Thursday. The study, its authors say, adds to evidence suggesting that certain environmental exposures could play a role in causing the disorder in some children.

"This study isn't saying exposure to air pollution or exposure to traffic causes autism," said Heather Volk, lead author of the paper and a researcher at the Saban Research Institute of Children's Hospital Los Angeles. "But it could be one of the factors that are contributing to its increase."

Reported cases of autism cases increased by 57% between 2002 and 2006, according to the Centers for Disease Control and Prevention, although professionals still debate whether rates have actually risen or a greater proportion of autistic children is being diagnosed. An estimated 1 in 110 children is diagnosed with autism today. There is no cure, although research has shown that various therapies can mitigate some symptoms, especially if begun early in life.

In the current study, published online in the journal *Environmental Health Perspectives*, researchers looked at 304 children with autism and, for comparison, 259 children who were developing normally. The children, between the ages of 24 months and 60 months at the start of the study, lived in communities around Los Angeles, San Francisco and Sacramento.

Each family was evaluated in person, and all of the children received developmental assessments. Researchers collected data on where each child's mother lived during pregnancy and at the time of birth, and the proximity of the homes to a major road or freeway.

Children living about 1,000 feet from a freeway at birth — about 10% of the sample — had a two-fold increase in autism risk. The link held up even after researchers controlled for other factors that may influence development, such as ethnicity, parental education, maternal age and exposure to tobacco smoke.

The study did not find a link between autism development and proximity to a major road, as opposed to a freeway. That may be due to the type and quantity of chemicals dispersed on freeways compared with major roads, Volk said. In Los Angeles, some freeways carry more than 300,000 vehicles daily.

Gayle Windham, chief of the epidemiology surveillance unit with the California Department of Health Services Environmental Investigations Branch, said the study did not directly implicate air pollution as a risk factor for autism because it did not have a way of measuring how much pollution the mothers were exposed to during pregnancy. "They are using a proxy measure for air pollution, which is distance to a freeway," she said. "But you still don't know how much time the women spent at home or working or commuting." Windham was not involved in the study. Windham was the lead author of a 2006 study, also published in *Environmental Health Perspectives*, that found that children with autism were about 50% more likely to have a birth residence in an area with hazardous air pollutants. The study was based on air pollution data from the Environmental Protection Agency that was matched to birth records in the San Francisco Bay Area.

Research like this suggests environmental factors need more attention, said Clara Lajonchere, vice president of clinical programs for the advocacy group Autism Speaks. Lajonchere was not involved in the study.

"The implication could be very far reaching in terms of prevention and public health concerns," Lajonchere said. "I think it's pretty well established that genes play a huge role in autism. But there is something going on beyond genetics."

Chronic exposure to air pollution during pregnancy is thought to have physical effects on the fetus. High levels of carbon monoxide, nitrogen dioxide and particulate matter have been linked to a higher risk of preterm birth and low birth weight. Chemicals such as ozone, sulfur dioxide and polycyclic aromatic hydrocarbons, or PAHs, have also been identified as harmful to a developing fetus.

"We know there are some chemicals in air pollution coming from diesel exhaust that might be a good forerunner to look at," Volk said. "But right now we really don't know what it is about air pollution that is associated with autism."

Families residing close to freeways may have to wait for more research before scientists can issue advice or recommendations on what to do about this potential risk, Volk said. For one thing, this study requires replication, she said. In addition, future studies will attempt to identify the level of exposure to particular pollutants.

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ONLINE FIRST

Traffic-Related Air Pollution, Particulate Matter, and Autism

Heather E. Volk, PhD, MPH; Fred Lurmann; Bryan Penfold; Irva Hertz-Picciotto, PhD; Rob McConnell, MD

Context: Autism is a heterogeneous disorder with genetic and environmental factors likely contributing to its origins. Examination of hazardous pollutants has suggested the importance of air toxics in the etiology of autism, yet little research has examined its association with local levels of air pollution using residence-specific exposure assignments.

Objective: To examine the relationship between traffic-related air pollution, air quality, and autism.

Design: This population-based case-control study includes data obtained from children with autism and control children with typical development who were enrolled in the Childhood Autism Risks from Genetics and the Environment study in California. The mother's address from the birth certificate and addresses reported from a residential history questionnaire were used to estimate exposure for each trimester of pregnancy and first year of life. Traffic-related air pollution was assigned to each location using a line-source air-quality dispersion model. Regional air pollutant measures were based on the Environmental Protection Agency's Air Quality System data. Logistic regression models compared estimated and measured pollutant levels for children with autism and for control children with typical development.

Setting: Case-control study from California.

Participants: A total of 279 children with autism and a total of 245 control children with typical development.

Main Outcome Measures: Crude and multivariable adjusted odds ratios (AORs) for autism.

Results: Children with autism were more likely to live at residences that had the highest quartile of exposure to traffic-related air pollution, during gestation (AOR, 1.98 [95% CI, 1.20-3.31]) and during the first year of life (AOR, 3.10 [95% CI, 1.76-5.57]), compared with control children. Regional exposure measures of nitrogen dioxide and particulate matter less than 2.5 and 10 μm in diameter ($\text{PM}_{2.5}$ and PM_{10}) were also associated with autism during gestation (exposure to nitrogen dioxide: AOR, 1.81 [95% CI, 1.37-3.09]; exposure to $\text{PM}_{2.5}$: AOR, 2.08 [95% CI, 1.93-2.25]; exposure to PM_{10} : AOR, 2.17 [95% CI, 1.49-3.16]) and during the first year of life (exposure to nitrogen dioxide: AOR, 2.06 [95% CI, 1.37-3.09]; exposure to $\text{PM}_{2.5}$: AOR, 2.12 [95% CI, 1.45-3.10]; exposure to PM_{10} : AOR, 2.14 [95% CI, 1.46-3.12]). All regional pollutant estimates were scaled to twice the standard deviation of the distribution for all pregnancy estimates.

Conclusions: Exposure to traffic-related air pollution, nitrogen dioxide, $\text{PM}_{2.5}$, and PM_{10} during pregnancy and during the first year of life was associated with autism. Further epidemiological and toxicological examinations of likely biological pathways will help determine whether these associations are causal.

Arch Gen Psychiatry.

Published online November 26, 2012.

doi:10.1001/jamapsychiatry.2013.266

AUTISM SPECTRUM DISORDERS are a group of developmental disorders commonly characterized by problems in communication, social interaction, and repetitive behaviors or restricted interests.¹ Although the severity of impairment for the autism spectrum disorders varies across the spectrum (full syndrome autism being the most severe), the incidence rate of all autism spectrum disorders is now reported to be as high as 1 in 110 children.² Emerging evi-

dence suggests that environment plays a role in autism, yet at this stage, only limited information is available as to what exposures are relevant, their mechanisms of action, the stages of development in which they act, and the development of effective preventive measures.

See related editorial

Recently, air pollution has been examined as a potential risk factor for autism. Using the Environmental Protection Agen-

Author Affiliations are listed at the end of this article.

Table 1. Spearman Correlations of Traffic-Related Air Pollution (TRP) and Regional Pollutants for 524 Children^a

First Year of Life Estimates	All Pregnancy Estimates				
	TRP	PM _{2.5}	PM ₁₀	Ozone	Nitrogen Dioxide
TRP	0.92 ^b	0.36 ^c	0.33 ^c	-0.36 ^c	0.60 ^c
PM _{2.5}	0.25 ^d	0.67 ^b	0.77 ^c	-0.11 ^c	0.63 ^c
PM ₁₀	0.27 ^d	0.84 ^d	0.82 ^b	0.13 ^c	0.66 ^c
Ozone	-0.31 ^d	0.26 ^d	0.27 ^d	0.74 ^b	-0.29 ^c
Nitrogen dioxide	0.58 ^d	0.60 ^d	0.64 ^d	-0.19 ^d	0.89 ^b

Abbreviations: PM_{2.5}, particulate matter less than 2.5 μm in aerodynamic diameter; PM₁₀, particulate matter less than 10 μm in aerodynamic diameter.

^aAll correlation measures were statistically significant ($P < .05$).

^bCorrelations of the same pollutant across time periods.

^cCorrelations across pollutants within pregnancy.

^dCorrelations across pollutants within the first year of life.

cy's dispersion-model estimates of ambient concentrations of hazardous air pollutants, Windham and colleagues³ identified an increased risk of autism based on exposure to diesel exhaust particles, metals (mercury, cadmium, and nickel), and chlorinated solvents in Northern California census tracts. Additional research using dispersion-model estimates of hazardous air pollutants also reported associations between autism and air toxics at the birth residences of children from North Carolina and West Virginia.⁴ These epidemiologic findings on autism are supported by additional research^{5,6} describing other physical and developmental effects of air pollution due to prenatal and early life exposure. For example, high levels of air pollutants have been associated with poor birth outcomes, immunologic changes, and decreased cognitive abilities.^{5,6}

Recently, we reported an association between the risk of autism and an early life residence within 309 m of a freeway in the Childhood Autism Risks from Genetics and the Environment (CHARGE) study.⁷ The near-source traffic-related air pollutant mixture has a large spatial variation, returning to near-background daytime levels beyond this distance.^{8,9} Herein, we report associations of autism with estimates of exposure to the mixture of traffic-related air pollution and with regional measures of nitrogen dioxide, particulate matter less than 2.5 μm in aerodynamic diameter (PM_{2.5}), and particulate matter less than 10 μm in aerodynamic diameter (PM₁₀) in the CHARGE sample.

METHODS

The CHARGE study is a population-based case-control study of preschool children. The study design is described in detail elsewhere.¹⁰ In brief, the participants in the CHARGE study were between the ages of 24 and 60 months at the time of recruitment, lived with at least one English- or Spanish-speaking biological parent, were born in California, and lived in one of the study catchment areas. Recruitment was facilitated by the California Department of Developmental Services, the regional centers with which they contract to coordinate services for persons with developmental disabilities, and referrals from the MIND (Medical Investigation of Neurodevelopmental Disorders) Institute clinic at the University of California, Davis, and from other research studies. Population-based control children were recruited from the sampling frame of birth files from the state of California and were frequency matched by sex, age, and broad geographic area to the children with autism.

Each participating family was evaluated. Children with a previous diagnosis of autism were evaluated using the Autism Diagnostic Observation Schedules, and parents were administered the Autism Diagnostic Interview-Revised.^{11,12} Children who received a diagnosis of developmental delay and control children from the general population were given the Social Communication Questionnaire to screen for the presence of autistic features.¹³ If the Social Communication Questionnaire score was 15 or greater, the child was then evaluated using the Autism Diagnostic Observation Schedules, and the parent was administered the Autism Diagnostic Interview-Revised. In our study, autism cases were children with a diagnosis of full syndrome autism from both the Autism Diagnostic Observation Schedules and the Autism Diagnostic Interview-Revised. All children were also assessed using the Mullen Scales of Early Learning and the Vineland Adaptive Behavior Scales to collect information on motor skills, language, socialization, and daily living skills.^{14,15} Controls were children from the general population who received a Social Communication Questionnaire score of less than 15 and who also showed no evidence of other types of delay (cognitive or adaptive).

Parents were interviewed to obtain, among other factors, demographic and medical information and residential histories. Race/ethnicity data were collected by self-report in categories defined by the US Census (**Table 1**). The residential data captured addresses and corresponding dates the mother and child lived at each location beginning 3 months before conception and extending to the most recent place of residence. Further details about the collection of clinical and exposure data have been previously reported.¹⁰

To obtain model-based estimates of exposure to traffic-related air pollution, we applied the CALINE4 line-source air-quality dispersion model.¹⁶ The dispersion model was used to estimate average concentrations for the specific locations and time periods (trimesters of gestation and first year of life) for each participant. The principal model inputs are roadway geometry, link-based traffic volumes, period-specific meteorological conditions (wind speed and direction, atmospheric stability, and mixing heights), and vehicle emission rates. Detailed roadway geometry data and annual average daily traffic counts were obtained from Tele Atlas/Geographic Data Technology in 2005. These data represent an integration of state-, county-, and city-level traffic counts collected between 1995 and 2000. Because our period of interest was from 1997 to 2008, the counts were scaled to represent individual years based on estimated growth in county average vehicle-miles-traveled data.¹⁷ Traffic counts were assigned to roadways based on location and street names. Traffic volumes on roadways without count data (mostly small roads) were estimated based on median volumes for similar class roads in small geographic regions. Meteorological data

from 56 local monitoring stations were matched to the dates and locations of interest. Vehicle fleet average emission factors were based on the California Air Resource Board's EMFAC2007 (version 2.3) model. Annual average emission factors were calculated by year (1997-2008) for travel on freeways (65 mph), state highways (50 mph), arterials (35 mph), and collector roads (30 mph) (to convert to kilometers, multiply by 1.6). We used the CALINE4 model to estimate locally varying ambient concentrations of nitrogen oxides contributed by freeways, nonfreeways, and all roads located within 5 km of each child's home. Previously, we have used the CALINE4 model to estimate concentrations of other traffic-related pollutants, including elemental carbon and carbon monoxide, and found that they were almost perfectly correlated (around 0.99) with estimates for nitrogen oxides. Thus, our model-based concentrations should be viewed as an indicator of the traffic-related pollutant mixture rather than of any pollutant specifically.

A second approach was to use the regional air quality data for the exposure assignments for PM_{2.5}, PM₁₀, ozone, and nitrogen dioxide. These were derived from the US Environmental Protection Agency's Air Quality System data (<http://www.epa.gov/ttn/airs/airsaqs>) supplemented by University of Southern California Children's Health Study data for 1997 through 2009.¹⁸ The Children's Health Study continuous PM data were used for a given monitoring station when no Federal Reference/Equivalent Method data for PM were available from the Air Quality System. The monthly air quality data from monitoring stations located within 50 km of each residence were made available for spatial interpolation of ambient concentrations. The spatial interpolations were based on inverse distance-squared weighting of data from up to 4 of the closest stations located within 50 km of each participant's residence; however, if 1 or more stations were located within 5 km of a residence, then only data from the stations within 5 km were used for the interpolation. Because special studies have shown large offshore-to-onshore pollutant gradients along the Southern California coast, the interpolations were performed with pseudostations (or theoretical locations used for estimating pollution gradients from extant data when geography did not permit observed data) located approximately 20 to 40 km offshore that had background concentrations based on long-term measurements (1994-2003) at clean coastal locations (ie, Lompoc, California).

Periods and locations relevant to the modeled traffic exposure were identified based on dates and addresses recorded on the child's birth certificate and from the residential history questionnaire. The birth certificate addresses corresponded to the mother's residence at the time of the child's birth, whereas the residential history captures both the mother's residences during pregnancy (required for estimation of prenatal exposure) and the child's residences after birth through the time of study enrollment. We determined the conception date for each child using gestational age from ultrasonographic measurements or the date of last menstrual period, as determined from prenatal records. We used these locations and dates to estimate exposure for the child's first year of life, for the entire pregnancy period, and for each trimester of pregnancy. When more than 1 address fell into a time interval, we created a weighted average to reflect the exposure level of the participant across the time of interest, taking into account changes in residence. Traffic-related air pollution was determined based on the required inputs reflecting change in each address over the study period. For the regional pollutant measures, we assigned PM_{2.5}, PM₁₀, and nitrogen dioxide measurements based on average concentrations for the time period of interest. For ozone, we calculated the averages for the period of interest based on the average range of ozone measurements from 1000 to 1800 hours (reflecting the high 8-hour daytime). Based on these methods,

we were able to assign traffic-related air pollutant estimates and regional pollutant measures for 524 mother-child pairs.

Spearman correlations were calculated pairwise between traffic-related air pollutant estimates and regional pollution measures for pregnancy and the first year of life to assess the independence of these exposure metrics. We used logistic regression to examine the association between exposure to traffic-related air pollution and the risk of autism. Models of autism risk as a function of traffic-related air pollutant exposure levels from all road types were fitted separately for each time period. Categories of exposure were formed based on quartiles of the traffic-related air pollutant distribution for all pregnancy estimates because this provided the most comprehensive data for each child. Levels of regional pollutants were examined as continuous variables, and effect estimates were scaled to twice the standard deviation of the distribution for all pregnancy estimates. When levels of correlation permitted, we examined both traffic-related air pollutants and regional pollutants in a single model. Pertinent covariates were included in each model to adjust for potential confounding due to sociodemographic and lifestyle characteristics. We included children's sex and ethnicity, maximum education level of the parents, mother's age, and whether the mother smoked during her pregnancy, as described previously.⁷ To examine whether our findings were affected by participants living in an urban or rural area, we included population density, which was obtained from Environmental Systems Research Institute Inc 2008 estimates of people per square meter using ArcGIS software version 9.2. We used the US Census Bureau cutoff of 2500 people per square meter to categorize population density into urban vs rural areas and included this variable as a covariate in our analysis of the effects of air pollution from the first year of life because these residences were the most recently recorded.

We also fitted logistic additive models to evaluate the relationship between autism and traffic-related air pollution. These models used the smoothing spline with 3 degrees of freedom for continuous traffic-related air pollution and used the same adjustment variables as in the linear logistic models already described. Statistical tests were conducted using an α level of .05, and 95% CIs were used to measure precision. All analyses were conducted using the R package version 2.9.2 (<http://www.r-project.org>). The institutional review boards of the University of Southern California and the University of California, Davis, approved the research.

RESULTS

The children in our study were predominantly male (84%), and most were non-Hispanic white (50%) or Hispanic (30%). No differences were found between cases and controls for any demographic, socioeconomic, or lifestyle variables that we examined (eTable, <http://www.archgenpsychiatry.com>). Details regarding the exposure distributions are presented in the eFigure, A and B. The Spearman correlations calculated for the first year of life and the pregnancy time periods are presented in Table 1. During pregnancy and during the first year of life, traffic-related air pollution was moderately correlated with PM_{2.5} and PM₁₀, highly correlated with nitrogen dioxide, but inversely correlated with ozone. Among the regional pollutant measures, PM_{2.5} and PM₁₀ were nearly perfectly correlated, and both were highly correlated with nitrogen dioxide. Correlations with ozone were low and often negative, demonstrating an inverse relationship. We also examined correlations of each pollutant

Table 2. Risk of Autism for 524 Children, by Quartile^a of Modeled Traffic-Related Air Pollution Exposure From All Road Types

Time Period	Odds Ratio (95% CI)		
	4th Quartile	3rd Quartile	2nd Quartile
First year of life			
Crude	2.97 (1.71-5.27)	1.00 (0.63-1.60)	0.88 (0.55-1.42)
Adjusted ^b	3.10 (1.76-5.57)	1.00 (0.62-1.62)	0.91 (0.56-1.47)
All pregnancy			
Crude	1.99 (1.22-3.28)	1.10 (0.67-1.78)	1.20 (0.74-1.95)
Adjusted ^b	1.98 (1.20-3.31)	1.09 (0.67-1.79)	1.26 (0.77-2.06)
First trimester			
Crude	1.91 (1.67-3.14)	1.28 (0.80-2.06)	1.28 (0.77-2.14)
Adjusted ^b	1.85 (1.11-3.08)	1.28 (0.79-2.08)	1.28 (0.77-2.15)
Second trimester			
Crude	1.69 (1.04-2.78)	1.15 (0.71-1.87)	0.89 (0.54-1.47)
Adjusted ^b	1.65 (1.00-2.74)	1.13 (0.69-1.84)	0.90 (0.54-1.49)
Third trimester			
Crude	2.04 (1.25-3.38)	0.92 (0.57-1.48)	1.12 (0.68-1.84)
Adjusted ^b	2.10 (1.27-3.51)	0.91 (0.56-1.46)	1.17 (0.71-1.93)

^aQuartile cut points correspond to traffic-related air pollution exposure levels of 31.8 ppb or greater (fourth quartile), 16.9 to 31.8 ppb (third quartile), and 9.7 to 16.9 ppb (second quartile), compared with 9.7 ppb or less (first quartile [reference group]).

^bModel adjusted for male sex of child, child's ethnicity (Hispanic vs white; black/Asian/other vs white), maximum education of parents (parent with highest of 4 levels: college degree or higher vs some high school, high school degree, or some college education), maternal age (>35 years vs ≤35 years), and prenatal smoking (mother's self-report of ever vs never smoked while pregnant).

ant across time periods, and high levels of correlation were identified.

EXPOSURE TO TRAFFIC-RELATED AIR POLLUTION

An increased risk of autism was associated with exposure to traffic-related air pollution during a child's first year of life. Children residing in homes with the highest levels of modeled traffic-related air pollution were 3 times as likely to have autism compared with children residing in homes with the lowest levels of exposure (**Table 2**). Exposure in the middle quartile groups (second and third quartiles) was not associated with an increased risk of autism. In our analysis, which included population density, this association with the highest quartile of exposure was still evident (adjusted odds ratio [AOR], 3.48 [95% CI, 1.81-6.83]), and living in an urban area, compared with living in a rural area, was not associated with autism (AOR, 0.86 [95% CI, 0.56-1.31]). When we examined traffic-related air pollutant exposures during pregnancy, the highest quartile was also associated with autism risk (AOR, 1.98 [95% CI, 1.20-3.31]) compared with the lowest quartile. We further divided the pregnancy into 3 trimesters and modeled traffic-related air pollution based on these intervals. During all 3 trimesters of pregnancy, we found associations with the highest quartile of exposure (≥31.8 ppb), compared with the lowest quartile (≤9.7 ppb), and autism (Table 2). Inclusion of demographic and socioeconomic variables in the models did not greatly alter these associations (Table 2).

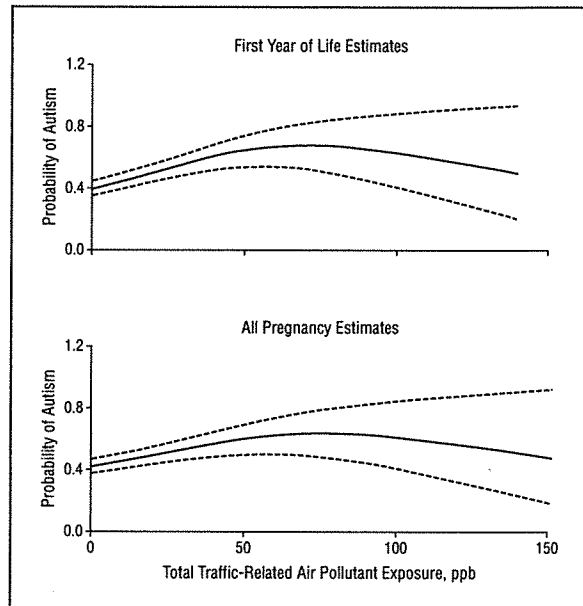


Figure. Probability of autism by increasing level of children's exposure to traffic-related air pollution during the first year of life and during gestation. The dashed lines indicate the 95% CI.

Because our quartile-based categories indicated that there is a threshold upon which traffic-related air pollutant exposure is detrimental, we also examined the relationship between traffic-related air pollutant exposure and autism using smoothed models for the first year of life and all of pregnancy. An increasing probability of autism was seen with increasing traffic-related air pollutant estimates, with the odds reaching a plateau when these estimates were above 25 to 30 ppb (**Figure**).

REGIONAL AIR POLLUTANT EXPOSURE

The higher levels of exposure to PM_{2.5}, PM₁₀, and nitrogen dioxide based on the Environmental Protection Agency's regional air quality monitoring program were associated with an increased risk of autism (**Table 3**). Specifically, for an 8.7-unit increase (micrograms per cubic meter) in PM_{2.5} (corresponding to twice the standard deviation of the PM_{2.5} distribution) exposure during the first year of life, children were 2.12 times more likely to have autism. Increases were also present for pregnancy and trimester-specific estimates of PM_{2.5}, with the smallest effects present in the first trimester. For PM₁₀, a 14.6-unit increase (micrograms per cubic meter) during the first year was associated with twice the risk of autism (Table 3). Associations were present for pregnancy and for each trimester, with the first trimester having the smallest magnitude. We did not find associations between levels of regional ozone and autism. Regional nitrogen dioxide exposure during the first year was associated with a 2-fold risk of autism. Similar effects were identified for nitrogen dioxide exposure during pregnancy. Although exposure during each of the 3 trimesters was associated with autism, the effects of the first trimester were the smallest. For all regional pollutant measures, adjustment for demographic and socioeconomic

Table 3. Risk of Autism for 524 Children Based on Continuous Regional Pollutant Exposure^a

Time Period	Odds Ratio (95% CI)			
	PM _{2.5}	PM ₁₀	Ozone	Nitrogen Dioxide
First year				
Crude	2.14 (1.48-3.09)	2.14 (1.47-3.10)	1.15 (0.72-1.84)	2.06 (1.39-3.06)
Adjusted ^b	2.12 (1.45-3.10)	2.14 (1.46-3.12)	1.15 (0.72-1.86)	2.06 (1.37-3.09)
All pregnancy				
Crude	2.11 (1.46-3.03)	2.17 (1.50-3.13)	1.08 (0.76-1.52)	1.82 (1.26-2.64)
Adjusted ^b	2.08 (1.93-2.25)	2.17 (1.49-3.16)	1.09 (0.76-1.55)	1.81 (1.23-2.65)
First trimester				
Crude	1.24 (0.99-1.56)	1.47 (1.10-1.98)	1.07 (0.86-1.33)	1.47 (1.07-2.01)
Adjusted ^b	1.22 (0.96-1.53)	1.44 (1.07-1.96)	1.08 (0.86-1.35)	1.44 (1.05-1.20)
Second trimester				
Crude	1.50 (1.16-1.93)	1.82 (1.35-2.45)	1.03 (0.84-1.27)	1.62 (1.17-2.25)
Adjusted ^b	1.48 (1.40-1.57)	1.83 (1.35-2.47)	1.04 (0.84-1.29)	1.61 (1.15-2.25)
Third trimester				
Crude	1.39 (1.11-1.75)	1.61 (1.21-2.13)	1.03 (0.84-1.27)	1.65 (1.19-2.27)
Adjusted ^b	1.40 (1.11-1.77)	1.61 (1.20-2.14)	1.03 (0.83-1.26)	1.64 (1.18-2.29)

Abbreviations: PM_{2.5}, particulate matter less than 2.5 μm in aerodynamic diameter; PM₁₀, particulate matter less than 10 μm in aerodynamic diameter.

^aRegional pollution effects reflect risk of autism based on 2 SDs from the mean value, specifically per increase of 8.7 μg/m³ of PM_{2.5}, 14.6 μg/m³ of PM₁₀, 14.1 ppb of nitrogen dioxide, and 16.1 ppb of ozone.

^bModels adjusted for male sex of child, child's ethnicity (Hispanic vs white; black/Asian/other vs white), maximum education of parents (parent with highest of 4 levels: college degree or higher vs some high school, high school degree, or some college education), maternal age (>35 years vs ≤35 years), and prenatal smoking (self-report of ever vs never smoked while pregnant).

variables did not alter the associations. As with traffic-related air pollution, when we included population density in the models that included exposure during the first year of life, the associations with PM_{2.5}, PM₁₀, and nitrogen dioxide did not change, nor did they change when living in an urban area vs a rural area was included (data not shown).

TRAFFIC-RELATED AIR POLLUTION, PM_{2.5}, AND PM₁₀

Because pairwise correlations between traffic-related air pollution and PM_{2.5} and between traffic-related air pollution and PM₁₀ were moderate, we included both in models to examine whether local pollution estimates (traffic-related air pollution) and regional pollution measures (PM_{2.5} and PM₁₀) were independently associated with autism. In these analyses, we included the same set of covariates already described in the single pollutant analysis. When examined in the same model, the top quartile of traffic-related air pollutant exposure (AOR, 2.37 [95% CI, 1.28-4.45]) and the exposure to PM_{2.5} (AOR, 1.58 [95% CI, 1.03-2.42]) during the first year of life remained associated with autism. Examining both traffic-related air pollution and PM₁₀, we found that the top quartile of traffic-related air pollutant exposure (AOR, 2.36 [95% CI, 1.28-4.43]) and the exposure to PM₁₀ (AOR, 1.61 [95% CI, 1.06-2.47]) remained associated with autism. For the all pregnancy time interval, we found that the top quartile of traffic-related air pollutant exposure (AOR, 2.42 [95% CI, 1.32-4.50]) and the exposure to PM_{2.5} (AOR, 1.60 [95% CI, 1.07-2.40]) were associated with autism when examined in the same model. Similarly, both the top quartile of traffic-related air pollutant exposure (AOR, 2.33 [95% CI, 1.27-4.36]) and the exposure to PM₁₀ (AOR, 1.68 [95% CI, 1.11-2.53]) remained associated with autism when examined jointly.

COMMENT

Our study found that local estimates of traffic-related air pollution and regional measures of PM_{2.5}, PM₁₀, and nitrogen dioxide at residences were higher in children with autism. The magnitude of these associations appear to be most pronounced during late gestation and early life, although it was not possible to adequately distinguish a period critical to exposure. Children with autism were 3 times as likely to have been exposed during the first year of life to higher modeled traffic-related air pollution compared with control children with typical development. Similarly, exposure to traffic-related air pollution during pregnancy was also associated with autism. Examination of traffic-related air pollution using an additive logistic model demonstrated a potential threshold near 25 to 30 ppb beyond which the probability of autism did not increase. Exposure to high levels of regional PM_{2.5}, PM₁₀, and nitrogen dioxide were also associated with autism. When we examined PM_{2.5} or PM₁₀ exposure jointly with traffic-related air pollutant exposure, both regional and local pollutants remained associated with autism, although the magnitude of the effects decreased.

We previously reported an association between living near a freeway (based on the location of the birth and third trimester address) and autism.⁷ That result relied on simple distance metrics as a proxy for exposure to traffic-related air pollution. The present study builds on that result, demonstrating associations with both regional particulate and nitrogen dioxide exposure and to dispersion-modeled exposure to the near-roadway traffic mixture accounting for traffic volume, fleet emission factors, and wind speed and direction, in addition to traffic proximity. The results provide more convincing evidence that exposure to local air pollution from traffic may increase

the risk of autism. Demographic or socioeconomic factors did not explain these associations.

Toxicological and genetic research suggests possible biologically plausible pathways to explain these results. Concentrations of many air pollutants, including diesel exhaust particles and other PM constituents, are increased near freeways and other major roads, and diesel exhaust particles and polycyclic aromatic hydrocarbons (commonly present in diesel exhaust particles) have been shown to affect brain function and activity in toxicological studies.¹⁹⁻²³ Polycyclic aromatic hydrocarbons have been shown to reduce expression of the *MET* receptor tyrosine kinase gene, which is important in early life neurodevelopment and is markedly reduced in autistic brains.^{24,25} Other research indicates that traffic-related air pollution induces inflammation and oxidative stress after both short- and long-term exposure, processes that mediate the effects of air pollution on respiratory and cardiovascular disease and other neurological outcomes.²⁶⁻²⁹ Data examining biomarkers suggest that oxidative stress and inflammation may also be involved in the pathogenesis of autism.³⁰⁻³³

Emerging evidence suggests that systemic inflammation may also result in damage to endothelial cells in the brain and may compromise the blood-brain barrier.²⁹ Systemic inflammatory mediators may cross the blood-brain barrier, activating brain microglia, and peripheral monocytes may migrate into the pool of microglia.³⁴⁻³⁶ In addition, ultrafine particles (PM_{0.1}) may penetrate cellular membranes.^{37,38} These particles translocate indirectly through the lungs and from the systemic circulation or directly via the nasal mucosa and the olfactory bulb into the brain.^{39,40} Toxicity may be mediated by the physical properties of PM or by the diverse mixture of organic compounds, including polycyclic aromatic hydrocarbons, and oxidant metals adsorbed to the surface.²⁹ Neurodevelopmental effects of polycyclic aromatic hydrocarbons may be mediated by aryl hydrocarbon hydroxylase induction in the placenta, decreased exchange of oxygen secondary to disruption of placental growth factor receptors, endocrine disruption, activation of apoptotic pathways, inhibition of the brain antioxidant-scavenging system resulting in oxidative stress, or epigenetic effects.²¹

Our study draws on a rich record of residential locations of children with typical development and children with autism across California, allowing us to assign modeled pollutant exposures for developmentally relevant time points. However, our results could also be affected by unmeasured confounding factors associated with both autism and exposure to traffic-related air pollution. Although we did not find that including demographic or socioeconomic variables altered our estimates of effect, confounding by other factors could still occur. These might include lifestyle, nutritional, or other residential exposures, if they were associated with traffic-related air pollution or PM. We have also not explored indoor sources of pollution, such as indoor nitrogen oxide or second-hand tobacco smoke, although prenatal smoking was examined and did not influence the associations of ambient pollution with autism. In addition, confounding could have occurred if proximity to diagnosing physicians or

treatment centers was also associated with exposure. We included population density as an adjustment in an analysis using estimates from the first year of life to examine the sensitivity of our results to urban or rural locations, for which population density is a surrogate. We did not find that living in a more densely populated area altered the association between risk of autism and exposure to traffic-related air pollution or regional pollutants. Despite our attempts to use residential history to examine specific time windows of vulnerability, to incorporate meteorology into our traffic-related air pollutant models, and to include pollutants with seasonal variation, we are currently unable to disentangle the trimester-specific effects during the first year of life because of the high level of correlation across these time periods.

Exposures to traffic-related air pollution, PM, and nitrogen dioxide were associated with an increased risk of autism. These effects were observed using measures of air pollution with variation on both local and regional levels, suggesting the need for further study to understand both individual pollutant contributions and the effects of pollutant mixtures on disease. Research on the effects of exposure to pollutants and their interaction with susceptibility factors may lead to the identification of the biologic pathways that are activated in autism and to improved prevention and therapeutic strategies. Although additional research to replicate these findings is needed, the public health implications of these findings are large because air pollution exposure is common and may have lasting neurological effects.

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REFERENCES

1. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed. Washington, DC: American Psychiatric Association; 2000.
2. Autism and Developmental Disabilities Monitoring Network Surveillance Year 2006 Principal Investigators; Centers for Disease Control and Prevention (CDC). Prevalence of autism spectrum disorders—Autism and Developmental Disabilities Monitoring Network, United States, 2006. *MMWR Surveill Summ*. 2009; 58(10):1-20.
3. Windham GC, Zhang L, Gunier R, Croen LA, Grether JK. Autism spectrum disorders in relation to distribution of hazardous air pollutants in the San Francisco Bay Area. *Environ Health Perspect*. 2006;114(9):1438-1444.
4. Kalkbrenner AE, Daniels JL, Chen JC, Poole C, Emch M, Morrissey J. Perinatal exposure to hazardous air pollutants and autism spectrum disorders at age 8. *Epidemiology*. 2010;21(5):631-641.
5. Currie J, Neidell M, Schmieder JF. Air pollution and infant health: lessons from New Jersey. *J Health Econ*. 2009;28(3):688-703.
6. Hansen CA, Barnett AG, Pritchard G. The effect of ambient air pollution during early pregnancy on fetal ultrasonic measurements during mid-pregnancy. *Environ Health Perspect*. 2008;116(3):362-369.
7. Volk HE, Hertz-Picciotto I, Delwiche L, Lurmann F, McConnell R. Residential proximity to freeways and autism in the CHARGE study. *Environ Health Perspect*. 2011; 119(6):873-877.
8. Zhu YF, Hinds WC, Kim S, Sioutas C. Concentration and size distribution of ultrafine particles near a major highway. *J Air Waste Manag Assoc*. 2002;52(9):1032-1042.
9. Zhu Y, Hinds WC, Kim S, Shen S, Sioutas C. Study of ultrafine particles near a major highway with heavy-duty diesel traffic. *Atmos Environ*. 2002;36(27): 4323-4335. doi:10.1016/S1352-2310(02)00354-0.
10. Hertz-Picciotto I, Croen LA, Hansen R, Jones CR, van de Water J, Pessah IN. The CHARGE study: an epidemiologic investigation of genetic and environmental factors contributing to autism. *Environ Health Perspect*. 2006;114(7):1119-1125.
11. Le Couteur A, Lord C, Rutter M. *Autism Diagnostic Interview-Revised (ADI-R)*. Los Angeles, CA: Western Psychological Services; 2003.
12. Lord C, Rutter M, DiLavore P, Risi S. *Autism Diagnostic Observation Schedule Manual*. Los Angeles, CA: Western Psychological Services; 2003.
13. Rutter M, Bailey A, Lord C. *A Social Communication Questionnaire (SCQ)*. Los Angeles, CA: Western Psychological Services; 2003.
14. Sparrow S, Cicchetti D, Balla D. *Vineland Adaptive Behavior Scales Interview Edition Expanded Form Manual*. Circle Pines, MN: American Guidance Services Inc; 1984.
15. Mullen E. *Mullen Scales of Early Learning*. Circle Pines, MN: American Guidance Services Inc; 1995.
16. Bensen PE. A review of the development and application of the CA-LINE3 and 4 models. *Atmos Environ Part B: Urban Atmosphere*. 1992;26(3):379-390. doi:10.1016/0957-1272(92)90013-1.
17. California Department of Transportation. California motor vehicle stock, travel and fuel forecast. <http://www.dot.ca.gov/hq/tsip/smb/documents/mvstaff/mvstaff05.pdf>. Published December 30, 2005. Accessed September 18, 2012.
18. Alcorn SH, Lurmann FW. *Southern California Children's Health Study exposure database*. Petaluma, CA: Sonoma Technology, Inc; 2003. Technology Report STI-95230-2453-FR3.
19. Ntziachristos L, Ning Z, Geller MD, Sioutas C. Particle concentration and characteristics near a major freeway with heavy-duty diesel traffic. *Environ Sci Technol*. 2007;41(7):2223-2230.
20. Perera FP, Rauh V, Whyatt RM, Tsai WY, Tang D, Diaz D, Hoepner L, Barr D, Tu YH, Camann D, Kinney P. Effect of prenatal exposure to airborne polycyclic aromatic hydrocarbons on neurodevelopment in the first 3 years of life among inner-city children. *Environ Health Perspect*. 2006;114(8):1287-1292.
21. Perera FP, Li Z, Whyatt R, Hoepner L, Wang S, Camann D, Rauh V. Prenatal airborne polycyclic aromatic hydrocarbon exposure and child IQ at age 5 years. *Pediatrics*. 2009;124(2):e195-e202.
22. Hougaard KS, Jensen KA, Nordly P, Taxvig C, Vogel U, Saber AT, Wallin H. Effects of prenatal exposure to diesel exhaust particles on postnatal development, behavior, genotoxicity and inflammation in mice. *Part Fibre Toxicol*. 2008; 5:3.
23. Brown LA, Khoubouei H, Goodwin JS, Irvin-Wilson CV, Ramesh A, Sheng L, McCallister MM, Jiang GC, Aschner M, Hood DB. Down-regulation of early ionotropic glutamate receptor subunit developmental expression as a mechanism for observed plasticity deficits following gestational exposure to benzo(a)pyrene. *Neurotoxicology*. 2007;28(5):965-978.
24. Levitt P, Campbell DB. The genetic and neurobiologic compass points toward common signaling dysfunctions in autism spectrum disorders. *J Clin Invest*. 2009; 119(4):747-754.
25. Campbell DB, D'Oronzio R, Garbett K, Ebert PJ, Mirmics K, Levitt P, Persico AM. Disruption of cerebral cortex MET signaling in autism spectrum disorder. *Ann Neurol*. 2007;62(3):243-250.
26. Castro-Giner F, Künzli N, Jacquemin B, Forsberg B, de Cid R, Sunyer J, Jarvis D, Briggs D, Vienneau D, Norback D, González JR, Guerra S, Janson C, Antó JM, Wjst M, Heinrich J, Estivill X, Kogevinas M. Traffic-related air pollution, oxidative stress genes, and asthma (ECHR). *Environ Health Perspect*. 2009;117(12):1919-1924.
27. Gilliland FD, Li YF, Saxon A, Diaz-Sanchez D. Effect of glutathione-S-transferase M1 and P1 genotypes on xenobiotic enhancement of allergic responses: randomized, placebo-controlled crossover study. *Lancet*. 2004;363(9403):119-125.
28. Künzli N, Jerrett M, Garcia-Esteban R, Basagaña X, Beckermann B, Gilliland F, Medina M, Peters J, Hodis HN, Mack WJ. Ambient air pollution and the progression of atherosclerosis in adults. *PLoS One*. 2010;5(2):e9096.
29. Block ML, Calderón-Garcidueñas L. Air pollution: mechanisms of neuroinflammation and CNS disease. *Trends Neurosci*. 2009;32(9):506-516.
30. Enstrom A, Krakowiak P, Onore C, Pessah IN, Hertz-Picciotto I, Hansen RL, Van de Water JA, Ashwood P. Increased IgG4 levels in children with autism disorder. *Brain Behav Immun*. 2009;23(3):389-395.
31. James SJ, Rose S, Melnyk S, Jernigan S, Blossom S, Pavliv O, Gaylor DW. Cellular and mitochondrial glutathione redox imbalance in lymphoblastoid cells derived from children with autism. *FASEB J*. 2009;23(8):2374-2383.
32. Li X, Chauhan A, Sheikh AM, Patil S, Chauhan V, Li XM, Ji L, Brown T, Malik M. Elevated immune response in the brain of autistic patients. *J Neuroimmunol*. 2009; 207(1-2):111-116.
33. Ashwood P, Enstrom A, Krakowiak P, Hertz-Picciotto I, Hansen RL, Croen LA, Ozonoff S, Pessah IN, Van de Water J. Decreased transforming growth factor beta1 in autism: a potential link between immune dysregulation and impairment in clinical behavioral outcomes. *J Neuroimmunol*. 2008;204(1-2):149-153.
34. Nguyen MD, Julien JP, Rivest S. Innate immunity: the missing link in neuroprotection and neurodegeneration? *Nat Rev Neurosci*. 2002;3(3):216-227.
35. Banks WA, Farr SA, Morley JE. Entry of blood-borne cytokines into the central nervous system: effects on cognitive processes. *Neuroimmunomodulation*. 2002-2003;10(6):319-327.
36. D'Mello C, Le T, Swain MG. Cerebral microglia recruit monocytes into the brain in response to tumor necrosis factor- α signaling during peripheral organ inflammation. *J Neurosci*. 2009;29(7):2089-2102.
37. Geiser M, Rothen-Rutishauser B, Kapp N, Schürch S, Kreyling W, Schulz H, Semmler M, Im Hof V, Heyder J, Gehr P. Ultrafine particles cross cellular membranes by nonphagocytic mechanisms in lungs and in cultured cells. *Environ Health Perspect*. 2005;113(11):1555-1560.
38. Rothen-Rutishauser B, Mueller L, Blank F, Brandenberger C, Muehlfeld C, Gehr P. A newly developed in vitro model of the human epithelial airway barrier to study the toxic potential of nanoparticles. *ALTEX*. 2008;25(3):191-196.
39. Campbell A, Araujo JA, Li H, Sioutas C, Kleinman M. Particulate matter induced enhancement of inflammatory markers in the brains of apolipoprotein E knockout mice. *J Nanosci Nanotechnol*. 2009;9(8):5099-5104.
40. Oberdorster G, Elder A, Rinderknecht A. Nanoparticles and the brain: cause for concern? *J Nanosci Nanotechnol*. 2009;9(8):4996-5007.

Study Focus	Findings	Citation	URL
<p>Autism</p>	<p>OBJECTIVES: We examined the association between autism and proximity of residence to freeways and major roadways during pregnancy and near the time of delivery, as a surrogate for air pollution exposure.</p> <p>METHODS: Data were from 304 autism cases and 259 typically developing controls enrolled in the Childhood Autism Risks from Genetics and the Environment (CHARGE) study. The mother's address recorded on the birth certificate and trimester-specific addresses derived from a residential history obtained by questionnaire were geocoded, and measures of distance to freeways and major roads were calculated using ArcGIS software. Logistic regression models compared residential proximity to freeways and major roads for autism cases and typically developing controls.</p> <p>RESULTS: Adjusting for socio-demographic factors and maternal smoking, maternal residence at the time of delivery was more likely to be near a freeway (≤ 309 m) for cases than for controls (odds ratio (OR)=1.86; 95% confidence interval (CI), 1.04-3.45). Autism was also associated with residential proximity to a freeway during the third trimester (OR=2.22; CI, 1.16-4.42). After adjustment for socioeconomic and sociodemographic characteristics, these associations were unchanged. Living near other major roads at birth was not associated with autism.</p> <p>CONCLUSIONS: Living near a freeway was associated with autism. Examination of associations with measured air pollutants is needed.</p> <p>We examined data from five double-blind randomized trials that assessed effects of various treatments on the change in CIMT. The trials were conducted in the Los Angeles area. Spatial models and land-use data were used to estimate the home outdoor mean concentration of particulate matter up to 2.5 micrometer in diameter (PM2.5), and to classify residence by proximity to traffic-related pollution (within 100 m of highways), PM2.5 and traffic proximity were positively associated with CIMT progression. Adjusted coefficients were larger than crude associations, not sensitive to modelling specifications, and statistically significant for highway proximity while of borderline significance for PM2.5 (p = 0.08), Annual CIMT progression among those living within 100 m of a highway was accelerated (5.5 micrometers/yr [95%CI: 0.13–10.79; p = 0.04]) or more than twice the population mean progression. For PM2.5, coefficients were positive as well, reaching statistical significance in the socially disadvantaged; in subjects reporting lipid lowering treatment at baseline; among participants receiving on-trial treatments; and among the pool of four out of the five trials.</p>	<p>Voik HE, Hertz-Piccolto I, Delwiche L, Lurmann F, McConnell R. Residential Proximity to Freeways and Autism in the CHARGE Study. <i>Environmental Health Perspectives</i>. 2010. Epub Ahead of Print. http://www.ncbi.nlm.nih.gov/pubmed/21156395</p>	
<p>Cardiovascular Disease</p>	<p>Conclusions: Consistent with cross-sectional findings and animal studies, this is the first study to report an association between exposure to air pollution and the progression of atherosclerosis – indicated with CIMT change – in humans. Ours suggests that air pollution may contribute to the acceleration of cardiovascular disease development – the main causes of morbidity and mortality in many countries. However, the heterogeneity of the volunteering populations across the five trials, the limited sample size within trials and other relevant subgroups, and the fact that some key findings reached statistical significance in subgroups rather than the sample precludes generalizations to the general population.</p>	<p>Künzli N, Jerrett M, Garcia-Esteban R, Basagaña X, Beckermann B, et al. (2010) Ambient Air Pollution and the Progression of Atherosclerosis in Adults. <i>PLoS ONE</i> 5(2): e9096. doi:10.1371/journal.pone.0090996</p>	<p>http://archinle.jamanetwork.com/article.aspx?articleid=1108717</p>
<p>Childhood Asthma</p>	<p>A study in Erie County, New York (excluding the city of Buffalo) found that children living in neighborhoods with heavy truck traffic within 200 meters of their homes had increased risks of asthma hospitalization. The study examined hospital admission for asthma amongst children ages 0-14, and residential proximity to roads with heavy traffic.</p>	<p>Lin, Munsie, Hwang, Fitzgerald, and Cayo. (2002). Childhood Asthma Hospitalization and Residential Exposure to State Route Traffic. <i>Environmental Research</i>, Section A, Vol. 88, pp. 73-81.</p>	
<p>Childhood Asthma</p>	<p>A study of nearly 10,000 children in England found that wheezing illness, including asthma, was more likely with increasing proximity of a child's home to main roads. The risk was greatest for children living within 90 meters of the road.</p>	<p>Venn A, et al. (2001). Living Near A Main Road and the Risk of Wheezing Illness in Children. <i>American Journal of Respiratory and Critical Care Medicine</i>. Vol. 164, pp 2177-2180.</p>	
<p>Childhood Asthma</p>	<p>A study of 1,068 Dutch children found that asthma, wheeze, cough, and runny nose were significantly more common in children living within 100 meters of freeways. Increasing density of truck traffic was also associated with significantly higher asthma levels - particularly in girls.</p>	<p>van Vliet P, et al. (1997). Motor exhaust and chronic respiratory symptoms in children living near freeways. <i>Environmental Research</i>. 74:127-132.</p>	
<p>Childhood Asthma</p>	<p>A study in Birmingham, United Kingdom, determined that living near major roads was associated with the risk of hospital admission for asthma in children younger than 5 years of age. The area of residence and traffic flow patterns were compared for children admitted to the hospital for asthma, children admitted for nonrespiratory reasons, and a random sample of children from the community. Children admitted with an asthma diagnosis were significantly more likely to live in an area with high traffic flow (> 24,000 vehicles/24 hours) located along the nearest segment of main road than were children admitted for nonrespiratory reasons or children from the community.</p>	<p>Edwards, J., S. Walters, et al. (1994). Hospital admissions for asthma in preschool children: relationship to major roads in Birmingham, United Kingdom. <i>Archives of Environmental Health</i>. 49(4): 223-7.</p>	
<p>Childhood Asthma, Respiratory illnesses</p>	<p>This cohort study found that two year old children who are exposed to higher levels of traffic-related air pollution are more likely to have self-reported respiratory illnesses, including wheezing, ear/nose/throat infections, and reporting of physician-diagnosed asthma, flu or serious cold.</p>	<p>Brauer et al. (2002). Air Pollution from Traffic and the Development of Respiratory Infections and Asthmatic and Allergic Symptoms in Children. <i>Am J Respiratory and Critical Care Medicine</i>. Vol. 166 pp 1092-1098.</p>	
<p>Childhood Asthma, school proximity</p>	<p>A study of 1498 children in 13 schools in the Province of South Holland found a positive relationship between school proximity to freeways and asthma occurrence. Truck traffic intensity and the concentration of emissions measured in schools were found to be significantly associated with chronic respiratory symptoms.</p>	<p>Speizer, F. E., and B. G. Ferris, Jr. (1973). Exposure to automobile exhaust. I. Prevalence of respiratory symptoms and disease. <i>Archives of Environmental Health</i>. 28(6): 313-8.</p>	
<p>Childhood Lung Development</p>	<p>A European study determined that exposure to traffic-related air pollution, 'in particular diesel exhaust particles', may lead to reduced lung function in children living near major motorways.</p>	<p>Brunekeer B, Janssen NA, de Haegh J, Harssema H, Knappe M, van Vliet P. (1997). "Air pollution from truck traffic and lung function in children living near motor-ways." <i>Epidemiology</i>. 8(3):298-303.</p>	
<p>Motor vehicle emissions dominate cancer risk</p>	<p>The most comprehensive study of urban toxic air pollution ever undertaken shows that motor vehicles and other mobile sources of air pollution are the predominant source of cancer-causing air pollutants in Southern California. Overall, the study showed that motor vehicles and other mobile sources accounted for about 90% of the cancer risk from toxic air pollution, most of which is from diesel soot (70% of the cancer risk). Industries and other stationary sources accounted for the remaining 10%. The study showed that the highest risk is in urban areas where there is heavy traffic and high concentrations of population and industry.</p>	<p>South Coast Air Quality Management District. Multiple Air Toxics Exposure Study-II. March 2000.</p>	
<p>Pediatric Cancers, Leukemia</p>	<p>A 2000 Denver study showed that children living within 250 yards of streets or highways with 20,000 vehicles per day are six times more likely to develop all types of cancer and eight times more likely to get leukemia. The study looked at associations between traffic density, power lines, and all childhood cancers with measurements obtained in 1979 and 1990. It found a weak association from power lines, but a strong association with highways. It suggested that benzene pollution might be the cancer promoter causing the problem.</p>	<p>Pearson et al. (2000). Distance-weighted traffic density in proximity to a home is a risk factor for leukemia and other childhood cancers. <i>Journal of Air and Waste Management Association</i> 50:175-180.</p>	
<p>Premature Birth, Low weight babies</p>	<p>Researchers observed an approximately 10-20% increase in the risk of premature birth and low birth weight for infants born to women living near high traffic areas in Los Angeles County. In particular, the researchers found that for each one part per million increase in annual average carbon monoxide concentrations where the women lived, there was a 19% and 11% increase in risk for low birth weight and premature births, respectively.</p>	<p>Wilhelm, Ritz. (2002). Residential Proximity to Traffic and Adverse Birth Outcomes in Los Angeles County, California, 1994-1996. <i>Environmental Health Perspectives</i>. doi: 10.1289/ehp.5688.</p>	

<p>Premature Death</p>	<p>Dutch researchers looked at the effects of long-term exposure to traffic-related air pollutants on 5,000 adults. They found that people who lived near a main road were almost twice as likely to die from heart or lung disease and 1.4 times as likely to die from any cause compared with those who lived in less-trafficked areas. Researchers say these results are similar to those seen in previous US studies on the effects of long-term exposure to traffic-related air pollution. The authors say traffic emissions contain many pollutants that might be responsible for the health risks, such as ultrafine particles, diesel soot, and nitrogen oxides, which have been linked to cardiovascular and respiratory problems.</p>	<p>Hoek, Brunekreef, Goldbohm, Fischer, van den Brandt. (2002). Association between mortality and indicators of traffic-related air pollution in the Netherlands: a cohort study. <i>Lancet</i>, 360 (9341): 1203-9.</p>
<p>Premature Death</p>	<p>Studies conducted in the vicinity of Interstates 405 and 710 in Southern California found that the number of ultrafine particles in the air was approximately 25 times more concentrated near the freeways and that pollution levels gradually decrease back to normal (background) levels around 300 meters, or 990 feet, downwind from the freeway. The researchers note that motor vehicles are the most significant source of ultrafine particles, which have been linked to increases in mortality and morbidity. Recent research concludes that ultrafine particles are more toxic than larger particles with the same chemical composition. Moreover, the researchers found considerably higher concentrations of carbon monoxide pollution near the freeways.</p>	<p>Zhu, Hinds, Kim, Sioutas. Concentration and size distribution of ultrafine particles near a major highway. <i>Journal of the Air and Waste Management Association</i>. September 2002. Zhu, Hinds, Kim, Shen, Sioutas. Study of ultrafine particles near a major highway with heavy-duty diesel traffic. <i>Atmospheric Environment</i>. 36(2002), 4323-4335.</p>
<p>Vulnerable populations</p>	<p>Freeway-related air pollution and its harmful health risks have been observed in recent research in the environmental-health sciences. In this study we investigate the impact of freeway and arterial-road air pollution on vulnerable populations—for example, the poor, minorities, children, and the elderly—whose housing options are limited. Because many mobile-source emissions decay rapidly with distance, approaching background concentrations at 330 ft from the freeway, populations living near limited access roads are most at risk from exposure. Furthermore, microscale air monitoring systems are rarely in place at these locations in the United States. In this research we will define freeway air-pollution sheds with the aid of a geographic information system analysis and determine populations that may be at risk from exposure to mobile-source pollutants in two West Coast metropolitan areas (Seattle and Portland). Finally, we discuss policy options, planning implications, and mitigation measures, including an assessment of air-quality monitoring needs and land-use prescriptions.</p>	<p>Bae C-H C, Sandlin G, Bassok A, Kim S, 2007, "The exposure of disadvantaged populations in freeway air-pollution sheds: a case study of the Seattle and Portland regions." <i>Environment and Planning B: Planning and Design</i> 34(1), 154 – 170</p> <p>http://www.envplan.com/abstract.cgi?id=b332124</p>

Jomsky, Mark

From: Greg Gunther <ggunther@frogkick.com>
Sent: Friday, August 14, 2015 6:56 PM
To: De La Cuba, Vannia; Andy Wilson; Thyret, Pam; Madison, Steve; Masuda, Gene; McAustin, Margaret; Gordo, Victor; Tornek, Terry; Bell, Cushon; John Kennedy; Sullivan, Noreen
Cc: Jomsky, Mark
Subject: General Plan EIR > Support Efficient Transportation Alternative

Dear Mayor Tornek and City Councilmembers -

After more than five years of extensive participation in the General Plan process, I regret that this important message must be delivered in writing (rather than in person, before Council) as I am tap-tap-tapping this out to you from my vacation.

That said, I am speaking here as a Resident of Downtown Pasadena - I am focusing on the Central District - and I have just three short points I'd like to communicate...

1. Please Evaluate the EIR Alternatives *Strategically*

As you know, our collective responsibility in the General Plan is to set our City's direction across a 20-year time horizon, so first and foremost, this is a strategic question.

In that light, land use should be based on thoughtful allocations (not broad brush number exercises) - and choices should NOT be formulaic [$(x+y) / 2$] - as reflected in the Residential component of the Staff Recommendation for the Central District.

Rather, sound leadership dictates that we take a strategic approach that says "Let's set our goals and evaluate our assets, then let's choose an appropriate path."

2. Please Consider Pasadena's Unique Assets and Goals

While our list of goals and aspirations for Pasadena is as extensive and diverse and we are, I cannot think of two more important goals than *Environmental Sustainability* and *Economic Sustainability*. Period.

Fortunately, to get us there, we have two strategic assets that provide advantages not found in other communities, specifically: the neural networks of our innovation and arts cultures, and the transportation backbone (Gold Line) that connects us regionally.

Our General Plan Land Use decisions should be made with a clear eye on the synergies available that incorporate these unique goals and assets. Let's not blind ourselves (or bind ourselves) with a fearful focus on "density dramas" that are rooted in 20th Century automobile modalities.

As a Transportation Commissioner, I can assure you that the "density=traffic" argument is fallacious and it does NOT apply. It's a fact: Higher densities - built around walkable, mixed-use neighborhoods with access to transit WILL statistically generate less car traffic.

If we build it right, we'll look forward and be positioned to deliver the advantages and preferences reflected by the mobility and housing choices that our children and grandchildren are already making!!

In short: Let's support choices that capitalize on Transit-Oriented Development. These opportunities are unique to Pasadena and they ensure a future that (in combination) offers us the most in both environmental quality and economic strength!

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3. Please Support the "Efficient Transportation Alternative"

Let's not argue about raw numbers in the abstract as we set the framework for potential development over the next two decades - that just misses the point. Rather, let's make sure that Land Use decisions are grounded in a thoughtful allocation - one based on our City's unique assets and our economic sustainable path.

In that light, the "Efficient Transportation Alternative" sets the right strategy to reflect our values, our priorities and our direction. It is the right path for the future City of Pasadena that we want to become.

Thank you for your consideration -

// Greg Gunther

700 E. Union Street, #301

Pasadena, CA 91101

15 AUG 17 09:58M
CITY CLERK



August 14, 2015

Mayor Terry Tornek
Pasadena City Council
100 North Garfield Avenue
Pasadena, CA 91109
VIA EMAIL

Re: Pasadena General Plan

Dear Mayor Tornek and Pasadena City Council

The Pasadena Chamber of Commerce is dismayed to find out that, following extensive public meetings, hearings and discussions, that the recommended development levels for Pasadena's downtown have been diminished even further than the amount recommended to be studied under the Environmental Impact Report.

The Pasadena Chamber, its members and staff have been involved in the formulation of the proposed General Plan and recommend that development levels be increased, rather than decreased.

People want to live in downtown Pasadena. People want to work in downtown Pasadena. Our economy depends on a vibrant and growing downtown Pasadena. Diminishing levels of development further than the already too low levels studied under the EIR will further increase the perception of Pasadena as being a city that does not want business or growth.

These diminished numbers likely will mean the City of Pasadena will have to revisit the General Plan in a much shorter than anticipated time frame. The 20 year plan will likely need to be revised in five to ten years.

Please consider increasing development levels in the General Plan.

Thank you for your service to Pasadena and your consideration of our position on the development caps recommended by staff in the General Plan.

Sincerely,

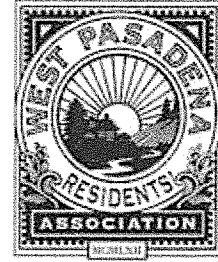
A handwritten signature in blue ink, appearing to read "Paul Little".

Paul Little
President and Chief Executive Officer

Cc: M. Jomsky, M. Beck, V. Bertoni

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15 AUG 17 09:50M
CITY CLERK



August 14, 1015

Honorable Members of the City Council
City of Pasadena
C/o Mr. Mark Jomsky, City Clerk
mjomsky@cityofpasadena.net

Honorable Council:

**Subject: WPRA Request for Hearing Continuance to Allow Adequate Time for Public Input
General Plan Update 2015, City Council Hearing scheduled for Monday August 17, 2015**

I have been authorized by the Board of Directors of the West Pasadena Residents' Association (WPRA) to urge a continuance until September of the public hearing scheduled Monday August 17 to address the review and adoption of the 2015 update of the City's General Plan.

The update of the 2004 Plan by preparation of this new General Plan has been a long and soon-to-be-consummated effort by your City staff, neighborhood organizations like ours, residents, and businesses. All those involved are to be commended, as the final work-product is a thorough meld of professional work and community input.

The General Plan is of critical importance to all neighborhoods in Pasadena. Residents have waited patiently seven long years for drafting of the Plan and EIR process to be completed. The final version of this massive and complex document was just released to the public in July, during the height of the vacation season.

Seven years of effort should not receive final hearing when a huge percentage of Pasadena residents are on vacation. We urge you to please reschedule the agenda item for the General Plan to a date after Labor Day, to allow our neighborhood to properly participate.

Thank you.

Respectfully submitted,

Ken Grobecker AICP
Principal, Townscape.
Land Use chair, WPRA
Townscape1@aol.com

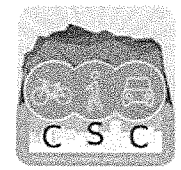
CC:

Mayor Terry Tornek, ttornek@cityofpasadena.net
City Manager Michael J. Beck, mbeck@cityofpasadena.net
Director of Planning Vincent Bertoni vbertoni@cityofpasadena.net
Senior Planner V. Chima. vchima@cityofpasadena.net

Bcc:

G. Baum, President WPRA baum@wpra.net

08/17/2015
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August 16, 2015

Re: 8/17 Pasadena City Council Meeting - PasCSC General Plan and Mobility Element Comments

Dear Mayor Tornek, Council Members and Staff,

The Pasadena Complete Streets Coalition (PasCSC) is committed to improving the safety and efficiency of our streets. Indeed, our founding coalition goals are to:

- 1) Facilitate the implementation of "Complete Streets" projects in the City of Pasadena.
- 2) Reduce the number of pedestrian-automobile and bicycle-automobile collisions that result in serious injury or death in the City.
- 3) Support the City's Guiding Principle #5 – "Pasadena will be a City where people can safely circulate without cars."

General Plan Comments

In light of these goals, PasCSC has the following comments on the General Plan and Mobility Element:

- 1. **PasCSC strongly encourages the Council to adopt a final General Plan and Mobility Element on 8/17** so that a critical nexus study on Traffic Reduction and Transportation Improvement Fees (TRTIFs) can move forward. At present TRTIFs cannot be spent on pedestrian or bicycle improvements in the City, a historic oversight that has resulted in piecemeal improvements over the past several decades. This is a very time-sensitive matter as several major developments, including the Parsons/Lincoln project, will soon pull building permits, yielding millions in TRTIFs.
- 2. **PasCSC supports the draft Mobility Element.** We support the objectives of enhanced livability, promoting walking, biking, transit and other alternatives to motor vehicles, and creating a supportive climate for economic vitality. We support the policies listed to achieve the objectives, and we look forward to working with staff to implement these policies, including the Bicycle Transportation Action Plan.
- 3. **PasCSC supports the Efficient Transportation alternative.** Higher density development near transit creates walkable, mixed-use neighborhoods that will generate less automobile traffic. The EIR suggests that this alternative would reduce environmental impacts in six categories and also Vehicle Miles Traveled (VMT). As a plan for a future that will definitely include climate change, and that will likely include significant changes to how we travel (ride share, on-demand services, and self-driving cars), we feel this is the most progressive and visionary choice.
- 4. **PasCSC strongly encourages the City to fast-track pedestrian and bicycle improvements in tandem with pending development.** In order to mitigate traffic impacts and attract residents to a car-lite/free lifestyle, it will be critical that the City realize planned and pending Complete Streets projects as new residential projects and Metro Bicycle share come online.

Pasadena CSC is excited about Pasadena's future as a city known as a great place for walking, biking, and transit, and as a model for livable, people-friendly streets in the region.

Thank you for your consideration,

Blair Miller on behalf of the Pasadena Complete Streets Coalition
www.pas-CSC.org