June 29, 2012

James O'Sullivan Mike Eveloff Fix The City

Sharon Gin Legislative Assistant Office of the City Clerk 200 N. Spring Street, 3rd Floor or via email to: <u>sharon.gin@lacity.org</u> phone: 213-978-1074

Re. "Hollywood Community Plan, Council File 12-0303"

Dear Ms. Gin

After several conversations with Candy Rosales we could not figure out what happened to several files submitted on a previous CD to the Clerks office. We don't know if they got corrupted or were somehow deleted so we agreed to resubmit them on a separate CD. We are resubmitting a 6/18/2012 letter already in the record that lists the files on the original CD along with this letter. We are also highlighting files that were small enough for us to submit electronically and are currently in the record. We are not resubmitting the CD 5 HOA meeting with Councilman Eric Garcetti as we were assured it was still intact on the original CD.

Several of the files, specifically LAFDFULL V. MCP V. DEPPLN2 (248 MB, 169,161 pages) are extremely large which is why we submitted them on a CD, and we are not sure how they would be placed online in the file. As such we would agree that this letter could be put into the record noting that there is a CD with the large files on them, and that they can be copied by person's compiling a record. As such we are submitting two (2) CD's for the file.

LADWP_Presentation_June 4_Final	(4.24 MB)
1947 Town Hall	(1.16 MB)
All Choked Up	(8.66 MB)

i.

INFRASUIT Explained FTC	(2.19 MB)
LAFDFULL V. MCP V. DEPPLN2	(248 MB)
NFSRPetitionforReview	(4.79 MB)
Nrdc-letter	(912 kb)
Paramedic Response	(94 kb)

We hope this is sufficient but if not please call me at 213-840-0246 so that we might find another solution.

We are truly sorry that it was necessary to submit these files at the last minute but in our opinion they became absolutely necessary when a new Revised Findings were submitted to the Council on 6/19/2012.

Sincerely: 

James O'Sullivan Mike Eveloff Fix The City

Allendy in File CF 0303

June 18, 2012

James O'Sullivan Mike Eveloff Fix The City

Sharon Gin Legislative Assistant Office of the City Clerk 200 N. Spring Street, 3rd Floor or via email to: sharon.gin@lacity.org phone: 213-978-1074

Re. "Hollywood Community Plan, Council File 12-0303"

Dear Ms. Gin

Sorry I wasn't able to personally deliver the CD I dropped off at the Clerk's office today. It is a further communication on the Hollywood Community Plan Update. We felt we needed to provide further documentation after the City released their 6/14/2012 second addition the FEIR which among things contained a Revised Mitigation Monitoring program (MMP). This Revised MMP suggested that there could be a different strategy at play to deal with Mitigations for Serious Environmental Impacts, possibly based on recent published opinions. As such we believed we needed to include materials that would be beneficial to all concerned should a legal challenge prove necessary. I was also able to drop off copies of the CD to Council Members Garcetti, LaBonge and the Mayor's office. The CD contained the following files:

LADWP_Presentation_June 4_Final	(4.24 MB)
1947 Town Hall	(1.16 MB)
All Choked Up	(8.66 MB)
Appellant Fix The City Opening Brief	(2.82 MB)
DSDATAEVAL	(1.62 MB)
INFRASUIT Explained FTC	(2.19 MB)
LaBongeInfra	(355 kb)
LAFDFULL V. MCP V. DEPPLN2	(248 MB)
NFSRPetitionforReview	(4.79 MB)

Nrdc-letter	(912 kb)
Paramedic Response	(94 kb)
Eric Garcetti CD 5 HOA Coalition meeting.	(2.80 BB)

Please include the files from the CD to the Council File record.

Sincerely: James O'Sullivan Mike Eveloff Fix The City

PS. I am including several files contained on the disk dropped off today, along with this communication to help you get a quicker start on posting our materials.



**Presentation Outline** LADWP Overview Ratepayer Advocate Water and Energy Industry Transformation Service Reliability Remains our Priority A Sound Financial Picture for LADWP **Upcoming Public Input Process** 

# We know we are working for you 24/7.



We provide safe drinking water and reliable electrical power to 4 million people, every day.

# We deliver over 450 million gallons of water every day.

### We provide Los Angeles with approximately 77 million kilowatt-hours of electricity on a typical day, and double that on hot summer days.

We are **leading the state** in the transition to **green energy**. 540 wind turbines 10 million square feet of solar panels 146 megawatts of small hydropower plants



To protect public health and natural resources, we check for over 200 contaminants by running more than **240,000 water quality tests** a year.

We **innovate** to save you money.

LA's per capita water use is the lowest of any major city. Encouraged to conserve, Angelenos saved more than 70 billion gallons over the last two years. Thank you!

We have more than 7,200 miles of drinking water pipelines in the City of L.A. They have to be kept in good condition to prevent breaks, spills and contamination.

WP

We have 3,655 miles of transmission lines – 27% of the CA grid – and over 14,000 miles of distribution lines. We power over 260,000 streetlights every night. L.A. has spoken and mandated a **Rate Payer Advocate**. LADWP supports this addition.

We support a Rate Payer Advocate immediately with funding, information and cooperation.

The water and power industry is undergoing a complete transformation and LADWP is at the epicenter.



New laws change how we provide service and what our **Power System** needs to be

### 72% of electric generation must be replaced

33% new renewable energy

No more coal in CA Currently 40% of City's energy is coal

No Ocean Water Cooling 3 of 4 local LADWP power plants use ocean water



New regulations and mandates also are changing our **Water System** 

No more open reservoirs Owens Lake dust mitigation Conversion from chlorine to chloramine 20% conservation by 2020



### LADWP Energy Supplies Today and in the Future

2010



### LADWP Water Supplies Today and in the Future



Over a short 15 years or less, we will replace 100% of our coal use through renewable energy, greater energy efficiency, and natural gas. We are totally eliminating ocean water cooling at our coastal power plants to protect marine habitats.



We are either covering or removing all of our open reservoirs from service to meet federal safe drinking water standards.

We are working closely with sister agencies, departments, and bureaus to integrate the planning of drinking water, stormwater, and wastewater facilities as those organizations face rapid change, too.



## Owens Valley 90% of dust on Owens Lake is now controlled Restored Lower Owens River Approximately \$1 billion spent to date \$175 million additional capital required in the next 2 ½ years



Increasing our local water supplies can reduce by over <u>half</u> our dependence on purchasing imported water.

## Achieving this transformation requires financial commitment.

## Our Water and Power Systems are over 100 years old. Age takes its toll



### We have an aging water distribution system

The average lifespan of a water main is less than 100 years

About 700,000 feet of our pipes are older than 100 years

With our current budget we can replace our pipelines only once every 400 years

This is not sustainable



Our **power transmission system** is getting older too.

With our current budget, we can replace our power poles once every 147 years and cables every 159 years.

This is not sustainable

When our water pipelines and power lines deteriorate, we are all at risk of **disrupted services and costly emergency repairs**.

### **Financial Background**

The utility industry is very capital intensive

Issuing bonds is an essential part of DWP's financial planning so customers rates are reasonable

This is similar to taking out a mortgage to buy a house

In the last two years DWP has borrowed over \$2.5 billion and more is needed to continue the transformation.

### **Financial Challenges**

Water and Power combined need to invest \$1.5 billion each year over the next 5 years to provide safe and reliable service, and to pay for legal mandates

The cost of financing (the mortgage) on these investments is going to require DWP to increase its revenue

DWP needs to maintain adequate financial reserves to enable this continued major financing

### Water System

DWP's Water System has an \$830 million annual budget and has traditionally borrowed \$250 million per year

In the last two years the DWP Water System has borrowed nearly \$1 billion.

To maintain reliable service and pay for legal mandates we need to borrow \$1.1 billion over the next four years.

This is not sustainable without more revenue

### **Power System**

#### \$3.3 billion total annual budget


# **Previous Year Programmatic Budget Cuts**

Budget cuts were made
in the following areas:
Renewable Energy Projects
Energy Efficiency
Water Capital, Operations & Maintenance

We clamped down to save **\$440 million** in basic business costs out of our budget over the next three years.

Hiring freeze and staff reductions Reduced overtime More efficient operations

Reduced capital expenditures



# Water Budget Requirement for Basic Business Needs



**Fiscal Year** 

\* Capital Funding includes depreciation and net interest expense

\$ in Millions

35

# Power Budget Requirement for Basic Business Needs



\* Capital Funding includes depreciation and net interest expense

We are stretching our resources, but time and transformation require more money.

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# Capital costs of Water Regulatory Mandates Basic Business Needs

	2011-12	5-year total	
<b>Total Cost of Mandates</b>	\$285 Million	\$1.4 Billion	

# **Examples:**

Owens Lake Dust Mitigation	\$62 Million	\$196 Million
Reservoir Covers & Bypass	\$148 Million	\$811 Million
Water Treatment Facilities	\$71 Million	\$351 Million

# Capital costs of Power Regulatory Mandates Basic Business Needs

	2011-12	5-year total
Total Cost of Mandates	\$593 Million	\$3.3 Billion

## **Examples:**

Solar	\$163 Million	\$391 Million
Other RPS	\$28 Million	\$1.7 Billion
Once Through Cooling	\$403 Million	\$1.3 Billion

# Power Reliability Program Budget Basic Needs



**Fiscal Year** 

# Water Reliability Program Budget Basic Needs



**Fiscal Year** 

# Basic business costs for our Water System are going to be higher

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Net Total Increase	\$119 M
Water Conservation	\$-16 M
Reliability Investments	\$-12 M
Purchased Water	\$21 M
Pensions	\$23 M
Inflation	\$23 M
Protecting Ability to Borrow	\$60 M
Local Water Supply	\$7 M
Regulatory Mandates	\$13 M
	Annual Increased Cost

# Basic business costs for our Power System will be higher too

	<u>Avg 3-Year</u> Annual Increased Cost
Regulatory Mandates	\$99M
Energy Efficiency	\$25M
Solar Incentive Program	\$10M
Fuel Price	\$23M
Protecting Ability to Borrow	\$175M
Inflation	\$60M
Pensions	\$55M
Reliability	\$-133M
Net Total Increase	\$314 M

The basic levels of investments still do not cover critical strategic objectives in our Power Integrated Resources Plan or our Urban Water Management Plan.

# A commitment to invest now in future reliability, efficiency, and sustainability is needed.

Strategic Water Investments Increase Pipeline Replacement Conserve more water Expand recycled water & storm water capture Clean up groundwater Strategic Power Investments More energy efficiency Balanced renewable energy mix Increase reliability Begin coal replacement Investing in the future of L.A.'s water means putting resources towards increasing our local water supplies – recycled water, groundwater cleanup, stormwater capture and reuse, water conservation – and cutting back on hundreds of millions of dollars spent annually for imported water.

# **Strategic water investments**

Pipeline & Related	Local Water Supply	Water Conservation
Infrastructure Replacement	Expand recycled water & groundwater replenishment	Achieve goal of 22,000 AFY in new water
Increase rate of replacements to once every 250 years	Enhance stormwater capture Increase groundwater cleanup	conservation by 2020 Continue & enhance long-term conservation programs
\$37M	\$30M	
		\$16M

3-year total additional cost

# Strategic power investments



3-Year total additional cost

# **Revenue and Rate Review Process**

		August LADWP Board discussion and vote Council E&E Committee review		October Approved ordinance published Rate actions take effect 30 days after publication		
June	July	Aug	Sept	Oct	Nov	Dec
June - July Stakeholder k Regional and customer wor City Council ( full Council) a Council feedk Board on pre-	oriefings and commercial rkshops (E&E Committee and Neighborhoo back to LADWP ferences for cost	or od	September Energy & Env Committee Re City Council Consideration	ironment eview and	November 1 New rates in e	l effect

# **Dates & Locations**

# **Community Collaboration Sessions**

## **North Valley**

Special Workshop for Neighborhood Councils June 18, 10:00 am – 12:30 p.m. Los Angeles Mission College

## **East Valley**

June 15, 6:30 p.m.– 9:00 p.m. Marvin Braude Constituent Center

## West L.A.

West Valley

6:30 p.m.- 9:00 p.m.

June 16

June 22, 6:30 p.m.– 9:00 p.m. Stephen S. Wise Temple

Holiday Inn – Warner Center

## East L.A.

June 20, 2011, 6 p.m. – 8:30 p.m. Boyle Heights Technology Youth Center

## South L.A.

June 21, 6:30 p.m.– 9:00 p.m. California African American Museum, Exposition Park

> Summary Session July 20, 6:30-9:00 pm LADWP Headquarters

Special Workshop for Neighborhood Councils July 23, Location TBD

## Harbor

June 27, 6:30 p.m. – 9:00 p.m. Crowne Plaza Los Angeles Harbor 601 S. Palos Verdes St., San Pedro 90731

# The dialogue is just beginning.

# What do you want for L.A.'s water and energy future?





# **TOWN HALL**

LOS ANGELES

# The Los Angeles Traffic and Transit Problem

A REPORT BY

THE REGIONAL PLANNING AND DEVELOPMENT SECTION

ARTHUR B. GALLION, Chairman

FEBRUARY, 1947

# The Los Angeles Traffic and Transit Problem

THE Los ANGELES traffic and transit problem has become so acute that one cannot enter the downtown district or drive on a major thoroughfare without wondering, "Why doesn't someone do something?" Comfort can be taken from the fact that the problem is common to all the large cities of the nation. Hope and determination, as well as comfort, should arise from the fact that Los Angeles has a better opportunity than most cities to tackle the problem effectively. But delay will destroy our present advantage; as population density rises and open areas are built up, the possibilities of effective action will diminish and the cost of necessary action will increase.

An effective attack upon the problem is possible, but a final solution is not to be expected. A permanent solution is no more possible than is a permanent fit in the shoes of a growing boy; each improvement in traffic facilities invites an increase in the traffic burden. To the degree that we can move more people from where they are to where they want to go, and do so with a minimum of cost, delay, and irritation, we can say that we have effectively attacked the problem. Until Los Angeles stops growing and changing, we cannot expect a final solution.

The traffic and transit problem has many elements. These include: freeways, and—since freeways can't be built overnight—the best use of existing streets, mass rapid transit, off-street parking facilities, and the financing of whatever plans are agreed upon. The purpose of the present report is to provide a broad perspective of these various elements for the average citizen, rather than to duplicate the many technical and engineering reports available for examination by the specialized student.

#### EFFECTIVE USE OF PRESENT STREETS

SINCE the construction of even the initial phase of the proposed freeway system will require several years, early alleviation of traffic congestion requires the most effective use of present street facilities. Much can be done, and fortunately much is being done. Among the suggested, planned, or already accomplished steps for improving the use made of present street facilities are: eliminating on-street parking in downtown areas, making certain streets into oneway streets, moving the dividing line on congested boulevards during peak traffic hours, eliminating left-hand turns at some intersections, installing better traffic signals at important intersections, rerouting some transit lines, and staggering work hours to flatten out the morning and evening traffic peak.

Wise application of such measures depends upon adequate traffic engineering. The problems remain the same in principle but change, often rapidly, in detail. The office of the City Traffic Engineer should be equipped with such staff as may from time to time be necessary for surveying the problems in detail and making recommendations which, based upon demonstrable fact, can be protected against attack by adversely affected special interests.

The elimination of on-street parking in the downtown district offers an example of conflicts of interest which arise when new regulations are proposed. Parking on both sides of a six-lane street reduces to four the number of lanes usable for traffic flow; backing into and moving out of curb parking spaces cause delays in the flow of traffic in two of the remaining traffic lanes. For this reason, the City Traffic Engineer and others have proposed that on-street parking be entirely prohibited on downtown streets. Such parking has already been sharply curtailed, particularly during rush hours, and fines imposed on violators have been substantially increased, a step necessary to enforcement.

The elimination of on-street parking is affected by the availability of off-street parking facilities, a problem discussed below. Whether elimination of off-street parking can be carried further now or may have already been carried too far is a question raised by a traffic court judge, who says he wants to see the streets "given back to the people," and who claims that congestion is caused by cars lining up in the streets while they wait to get into parking lots. To what extent onstreet parking should be allowed at the expense of traffic flow is a question which should be settled not by slogans but by engineering study through which each factor can be weighed in relation to others.

Problems of conflict between one factor or interest and others arise in connection with the creation of one-way streets, the elimination of

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turns, etc. It is not within the scope of this report to make recommendations upon the desirability of any one of these steps on any particular street or at any selected intersection. It is important that our present streets be used at maximum efficiency; as to particular steps for reaching this goal, decisions should be based upon careful, adequate, and continuously up-to-date traffic engineering studies.

#### OFF-STREET PARKING

THE FINEST possible system of freeways from shoreline to mountains would be to an extent wasted if the freeway user who wished to do business in the downtown district could not find a place to park when he got there. Off-street parking is a problem of other built-up areas as well as of the central business district. In the latter area, the problem is more acute and is of greater general concern to the whole metropolitan area of which it forms the hub.

At present, there is a conservatively estimated deficiency of ten to twelve thousand off-street parking spaces in the downtown area. As the population of the metropolitan area grows, still more parking spaces will be needed, while at the same time an attendant increase in land values would make retention of present parking lots more difficult.

The inter-relation of all aspects of the traffic problem is illustrated by the question of off-street parking. If all people now entering the downtown district on business came by private automobile, assuming the present average number of passengers per car, the area of parking space required to accommodate their cars would be greater than the total area of the district, including land now used by streets and occupied by buildings. It is apparent that increased travel in streetcars and busses (the mass transit phase of the total problem) rather than in private automobiles has an important bearing upon the need for off-street parking facilities.

To provide additional parking space and to prevent present parking space from being diverted to other uses, it would be possible for the city to condemn needed land. For two reasons, this seems a last rather than a first resort. It would add a new function to an already complex city government structure. The direct cost of condemning the land and the indirect cost of removing land from the tax rolls would be borue by all of the taxpayers, not solely by those who would benefit from the condemnations. The creation of a Parking District Authority is also legally possible. If the problem cannot be dealt with by private efforts, this may prove necessary and desirable.

The line of attack now being prepared against the off-street parking problem is a private corporation, sponsored by downtown property owners and business interests. Leaving the problem of parking in the area north of Second Street to the Civic Center authorities, the aim of this corporation is to aid in providing ten thousand additional parking spaces in the area south of Second Street. The corporation may buy, or lease, and operate parking lots, and may build and operate garages. The lack of unimproved land in the downtown district indicates that parking vertically, in garages, will be necessary. Of the ten thousand additional parking spaces, it is contemplated that three thousand would be open air, forty-five hundred would be in garages, and the remaining twenty-five hundred in a garage to be built under Pershing Square.

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The Pershing Square garage, patterned after the garage built just before the war under San Francisco's Union Square, will presumably be built and operated by a separate corporation. Assuming that construction and operating costs can be brought into line with prospective revenues, second mortgage money is expected from interested merchants and property owners, first mortgage money from banks and other financial institutions. Operation of the garage will require oneway streets on Fifth and Sixth Streets, already planned, and discontinuance of the use of Pershing Square as a bus terminal. As in San Francisco, the park above the underground garage can be preserved.

The Zoning Ordinance of 1946 contains requirements that new buildings provide minimum parking areas. These requirements will assist in keeping parking facilities abreast of the need for them as new areas are more intensively developed. It is important that these requirements be maintained and enforced.

#### FREEWAYS

The FREEWAY program for the Los Angeles metropolitan area has the agreement and support of all who are affected by the program and have studied it, particularly the county, the City of Los Angeles, and the suburban cities. Long-term plans call for 613 miles of freeways, with 2 projected cost of a billion dollars or more. Priorities in an initial

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ten-year program have been given to 165 miles of freeways to cost \$300,000,000. Routes have been agreed upon and on several routes acquisition of right of way has been substantially completed.

An important feature of this initial phase of the freeway program is the system of by-passes around the central downtown area. Surveys show that about half of the cars entering the downtown district have no destination within it but are going from one side of the metropolitan area to another. The proposed by-pass system would enable such cars to go around the downtown district. Remaining on the freeways, they would gain time and would avoid becoming involved in and adding to the congestion of downtown streets.

The main features of the freeway program having been agreed upon, questions remaining include the question of combining bus and train operation with the freeway program and the question of financing.

#### MASS TRANSPORTATION

UNLESS the freeway program is paralleled by a program for the improvement of mass transportation facilities it will create a problem almost as big as the one it solves. Downtown streets and parking facilities can never be made adequate to the situation which would exist if everyone came to the downtown district by private automobile. The building of express highways, unaccompanied by improved mass transportation facilities, tends to bring about just this situation; the proportion of people using private automobiles for their daily travel, already 50% here as compared with 15% in New York, will increase still further. Better and faster mass transit must go along with better and faster express highways.

It is estimated that an addition of about fifteen per cent to the cost of the freeway program would provide right of way necessary for rail lines in the dividing strip of those freeways where rail lines are appropriate. It is also believed that incorporating this feature in the freeway program would approximately double the program's effectiveness. The value to motorists of having adequate mass transit facilities, since they alleviate traffic congestion, is demonstrable although not easily measured. Yet, under present legal restrictions, gasoline taxes could not be used to buy such right of way (excepting to the extent to which a dividing strip of the required width is necessary as a highway safety feature). Nor have other methods of financing been found. Unless such other methods of financing are found, a relaxation of present legal restrictions on the use of gas tax money for this purpose appears both desirable and justified. A large part of sums devoted to such use could in any case be recovered from franchise fees, etc. Planning agencies have, in some instances, failed to emphasize the importance of developing mass transportation facilities as a part of the freeway program. It is believed that this development is essential and merits more positive consideration.

Certain other improvements in mass transportation as an adjunct of the freeway program are necessary and are in the process of study and development. Limitations on the possible extent and use of street space along with the desirability of increasing use of mass transit vehicles dictate the probable necessity of one or more subways for both rapid transit and urban transit use in the downtown area, with connections from these subways to the proposed center malls or rights of way on the most important freeways approaching this area. Transportation engineers have recommended a four-lane subway under Broadway and studies as to the feasibility of four-lane or two-lane subways are continuing. Also, the conversion of certain streets into one-way streets dictates the necessity of replacing existing streetcar lines by rerouting motor coach or trolley coach lines, particularly on 5th and 6th Streets and 8th and 9th Streets, since these streets have been designated for one-way use leading to and from the proposed by-pass system of the freeways. In conjunction with proposed reroutings and substitution of motor coach and trolley coach lines for streetcar lines, elimination of traffic hindrances created by left-hand turns is being considered and carried out.

#### FINANCING OF FREEWAYS

THE PROPOSED freeway program including the 165 miles of freeways for this area has been the matter of an extensive investigation covering a two-year period by a Joint Fact-Finding Committee on Highways, Streets, and Bridges of the California Legislature. This committee was created by Senate Concurrent Resolution No. 27 of the 56th Legislature and was directed to study and analyze all facts relating to public highways, roads, streets, and bridges of California and to report to the 57th Legislative Session which convened in Sacramento on the

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first Monday of January of this year. The reports of this committee and their recommendations indicate the necessity of added financing to present highway revenues if the construction program is to be carried out. These reports suggest possibilities of increasing revenues for this purpose by means of increasing gasoline taxes, registration fees, user taxes, and ad valorem taxes. The Governor of the State of California has indicated the importance of the subject by calling a special session of the Legislature to run concurrently with the 57th regular session for the principal purpose of considering the matter.

Our consideration of this subject has indicated both the necessity and reasonableness of the proposed freeway program in this area. It is probable that savings in the cost of present motor vehicle operations and reduction in losses resulting from accidents would more than balance the cost of the freeway program. As one student of the problem has said, "We are already paying for freeways without having them."

The proper method for raising necessary added revenues is a very complex and involved subject, to be determined only after giving adequate consideration to all of its state-wide phases. We believe that the proceeds of any added taxes for this purpose should be earmarked solely for the proposed program and should be imposed for a limited number of years. To assure expenditure of the proceeds in the metropolitan areas whose automobile owners are paying the largest part of the tax and where the major need exists, provision should be made for allocation of the proceeds within counties in proportion to their automobile registrations. It is believed that there should be modification of present restrictions against use of funds for necessary mass transportation facilities.

#### SUMMARY

THE TRAFFIC and transit problem is organic in character. Rather than remaining fixed, it is constantly growing and changing; its various aspects are closely inter-related. To keep abreast of the problem and to keep traffic congestion from strangling the movement and business of the city, adequate and continuous traffic engineering is necessary.

City government must be supported in its regulations to speed the flow of traffic, elimination of turns, restriction of on-street parking, etc.

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Off-street parking in the downtown district can probably be provided by the co-operation of private interests, without city condemnation and ownership of parking lots or the creation of new governmental agency in the form of a Parking District Authority. Public approval should be given the proposed Pershing Square underground garage, assuming that it is made subject to fair and appropriate agreements and controls.

The construction of the freeways, upon which affected interests in the metropolitan community appear to be in agreement, will be a major contribution to better traffic conditions. These freeways are necessary and reasonable, and adequate financing should be provided for their accomplishment.

Mass transportation facilities, part rail and part bus, must be developed along with the freeway program. The integration of rapid transit and local rail and motor coach service improvements with the freeway design and construction is essential and can be accomplished now with proper planning. A part of this integration will require subways for mass transit use and conversion of present facilities in order to make possible one-way traffic routing on various streets.

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#### REGIONAL PLANNING AND DEVELOPMENT SECTION

#### The Section's Meeting Record During This Study

- MARCH 13, 1946—Speaker: J. E. Havenner, Traffic Engineer, Public Safety Department, Automobile Club of Southern California. Subject: "We Can Solve Our Traffic Problem. WILL WE?"
- APRIL 19, 1946—Speaker: K. Charles Bean, Chief Engineer and General Manager, Board of Public Utilities, City of Los Angeles. Subject: "The Importance of Mass Transportation in Solving Our Traffic Problem."
- MAY 3, 1946-Speaker: Carl Bush, Assistant General Manager, Downtown Businessmen's Association. Subject: "The Problem of Parking Space-Traffic's Downtown Bottleneck."
- MAY 24, 1946-Speaker: Ralph T. Dorsey, City Traffic Engineer, Los Angeles. Subject: "Making the Most Effective Use of Our Present Traffic Facilities."
- JUNE 13, 1946—Speaker: Lloyd Aldrich, City Engineer, Los Angeles. Subject: "The Freeway Program and Its Relation to the Traffic Problem."
- JULY 16, 1946—Subject: "Lifstream of the City"—A General Electric film on the traffic problem, supplemented by comment by Stanley H. Lanham, General Consultant and Traffic Manager, Los Angeles Transit Company.
- AUGUST 1, 1946—Speaker: Harrison R. Baker, Member, State Highway Commission; President, Pasadena City Planning Commission. Subject: "The State Highway Department and the Metropolitan Traffic and Transit Problem."
- OCTOBER 23, 1946-Speaker: Milton Breivogel, Principal City Planner. Subject: "Summary of Section's Information on Traffic and Transit Problem; Discussion of Section's Future Agenda."
- NOVEMBER 13, 1946—Speaker: E. E. East, Chief Engineer, Automobile Club of Southern California. Subject: "Recommendations of the Collier Committee's Consultants on California's Highway Problem."
- DECEMBER 11, 1946-Subject: "The Section's Report on the Traffic and Transit Problem."
- JANUARY 8, 1947—Speaker: John M. Peirce, Economist, Western Oil and Gas Association. Subject: "Financing Freeways."
- JANUARY 22, 1947-Subject: "Reconsideration of the Section's Report on the Traffic and Transit Problem."

#### MEMBERS WHO ATTENDED ONE OR MORE MEETINGS OF REGIONAL PLANNING AND DEVELOPMENT SECTION DURING STUDY PERIOD

#### Arthur B. Gallion, Chairman

Alexander, Robert E. Apter, David Arkush, J. Robert Baer, Herman L. Barnard, Archer F. Barrett, Vernon Belknap, Raymond H. Bell, Ralph J. Bennett, Charles Benson, George C. S. Bernard, Robert J. Berzer, Maurice Bouton, Edward Breivogel, Milton Bryant, Drayton S. Burrows, R. D. Bushnell, John D. Campbell, Donald Carey, John G. Chase, Frederick A. Collins, D. I. Eliot, Charles W. FitzGerald, C. Grattan Fox, C. J., Jr.

Gleason, George Golsan, Page Gorman, Joseph G. Hackstaff, John D. Harbach, Edwin Harper, Allen D. Harrell, Harrell J. Hayward, Roger Hervey, William R., Jr. Hetherton, P. Hofeller, Eugene D. Hubon, I. A. Huntley, Earl W. Jeffries, Lawrence Johnson, Reginald D. Jones, Alfred Ketcham, Ronald M. Lefferts, E. B. Lunden, Samuel Mack, C. C. Mann, J. A. Manning, P. R. Mansfield, Allen Mansur, Everett B.

Merchant, Francis O. Miller, William B. Moreland, Watt S. Mowder, Fred L. Palmer, Edwin O. Pattee, Howard Rowan, George Ruck, W. F. Ryan, George P. Schuchardt, William Snyder, C. C. Stebbings, A. E. Story, Harold H. Utt, Max Eddy Vandenburgh, John Van Wart, Roy M. Verleger, P. K. Wall, Henry V. Weinhold, H. B. Wigmore, George T. Woods, D. W. Zahn, Otto J.

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# How the Members Voted

Members' Ballot on the Report: "The Los Angeles Traffic and Transit Problem"

I approve the report	Yes	438	No	7
I favor continuous and adequate traffic engineering study	Yes	5 453	No	2
I favor handling the downtown parking problem through:				
(a) private efforts	Yes	339	No	35
(b) city condemnation of parking space	Yes	84	No	190
(c) creation of a Parking District Authority	Yes	2 57	No	76
I approve in principle of the underground garage at Pershing Square	Yes	439	No	23
I favor an extensive freeway program	Yes	44 I	No	7
To be financed in part by:				
(a) added tax on gasoline	Yes	396	No	38
(b) increased tax on trucks	Yes	38 I	No	33
I favor bus and/or rail transit operation in conjunction with freeways	Yes	429	No	20
I favor use of gas tax money to finance added right of way for such operation, authorized by constitutional amendment necessary	if Yes	411	No	41



Los Angeles December, 1954

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The Traffic and Transit Problem of the Los Angeles Metropolitan Area



The Traffic and Transit Problem of the Los Angeles Metropolitan Area

> A REPORT OF THE REGIONAL PLANNING AND DEVELOPMENT SECTION Samuel E. Landen, Chairman

TOWN HALL

LOS ANGELES, DECEMBER, 1954

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Traffic and transit is the most important problem of the Los Angeles Metropolitan Area. The longer a solution is delayed, the more the development of the area will be handicapped. This report explains why the following are urgent needs: (1) an adequately financed, comprehensive study of the problem, to develop (2) a long-range master plan for traffic and transit, which must have (3) the understanding and support of the broad body of citizens in all parts of the community.

> Samuel E. Lunden, Chairman, REGIONAL PLANNING AND DEVELOPMENT SECTION

### Introduction

THE AVERAGE CITIZEN, exposed to the ever-increasing congestion of freeways and highways and to the frustrations of trying to travel by bus or trolley, is well aware that moving people within the Los Angeles Metropolitan Area is an acute community problem.

In spite of numerous studies and reports on various aspects of traffic and transit, there is little real understanding of the problem. The man in the street feels that "something must be done," but has no idea what; he is inclined to hope for a single, quick solution, but has no means of judging the merits of the various proposals made from year to year.

The purpose of this report, resulting from a year's study by the Regional Planning & Development Section of Town Hall, is to define the problem in terms of the special characteristics of the Los Angeles Metropolitan Area, to examine the various proposed solutions, and to recommend a renewed attack upon the problem. It is beyond the scope of this report to recommend a detailed traffic and transit plan. Moreover, the report is primarily concerned with the movement of people and does not undertake to cover the related problems of moving goods within the community.

Since the terms "mass transit" and "mass rapid transit" are used frequently in the report, it seems useful to define them at the very start. Mass transit is here used to denote a system of transportation which carries large numbers of passengers along fixed routes. Mass rapid transit is used to denote mass transit operating at high rates of speed, at frequent, short-spaced intervals, generally on special rights of way reserved for their exclusive use.

## Why People Travel Within the Community

IT is POSSIBLE to catalogue only the principal reasons that lead a person in a complex urban society to move from one place to another. Without such movement, however, large communities could not exist.

The average car-owning family may make as many as ten trips per day. The family without a car makes fewer trips on wheels, more on foot.

Few families live within walking distance of the offices and factories

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to which their working members must travel; mileage travelled to and from work often exceeds that of other daily trips combined. Efforts to get business, industry and their workers to accept staggered work hours have not been successful. Travel to and from work is the principal cause of traffic congestion at peak hours.

Those persons who use their cars during the day in the conduct of their business or work also contribute to the congestion at peak hours.

Many daily trips are made for shopping purposes. The increased use of the automobile for this purpose has led to the mushroom growth of supermarkets and suburban department stores, where parking facilities often take up more space than the store building themselves.

Americans in general and Southern Californians in particular are devoted to getting away from their homes for recreation. "Wouldn't it be fun to go to the beach?" "Let's go to the movies." "Why not run over to that restaurant in the Valley?" "Let's drop in on the Smiths in Pasadena." These are all reasons for hopping in the car or taking a bus or train.

Although neighborhood communities are more nearly self-contained and offer more diverse attractions than in earlier years, many cultural and recreational activities draw people long distances from their homes. In the Los Angeles area, also, most persons tend to have friends in various parts of the community rather than concentrate in their own neighborhood.

In short, whether for earning or spending money, or merely enjoying the opportunities of life in this large urban community, to live is to travel. To be confined, or to travel only with difficulty and expense, is to have one's life correspondingly curtailed.

If we assume as a goal the highest possible standard of living for the residents of a community, then the community's ability to move its people is an important factor in its economic efficiency. The transport system which undertakes to move these people is in the fullest sense a public service, as most private operators realize, and its costs must be weighed against the cost which the community as a whole must bear if adequate transit is unavailable.

## Special Characteristics of the Los Angeles Area

THE LOS ANGELES METROPOLITAN AREA has certain special characteristics which make the solution of its traffic and transit problem particu-

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larly difficult. Major among these characteristics are size, low population density, and rapid rate of population growth.

Los Angeles is an area of great distances. In contrast to older Eastern cities, built close around a harbor or waterway, its urban area spreads over 1,233 square miles, with a distance of 65 miles from the Eastern to the Western boundary.

It is not surprising, therefore, that the average population density of the City of Los Angeles, 4,154 persons per square mile, is only a fraction of that of other major cities. Greater New York, by contrast, has an average population density of approximately 25,000 persons per square mile.

In 30 years, the County of Los Angeles has increased its population from 1,250,000 people to 4,000,000. This rapid growth of population has not alleviated the problem presented to transit planners by low population density because the growth has been outwards. The prevalent and quite desirable preference for single-family dwellings indicates that, while population will continue to grow, density may not increase and may even decline. At the same time, progressive development of new communities at the periphery makes for constant evolution and change in the travel patterns of the entire area.

The location of industry in recent years has been based upon the assumption that most, if not all, workers will be able to come to the plant in private automobiles. More recently, city and county planners have been zoning industrial districts near outlying residential centers, such as the San Fernando and East San Gabriel Valleys, in order to bring the job nearer to the worker and to locate plants where a pool of labor is near at hand. This "planned decentralization" is taking place without reference to possible plans for a unified transit system.

One of the most difficult elements of Los Angeles' traffic problem is that of jurisdictional boundaries. Forty-six incorporated cities and the unincorporated areas of Los Angeles County are part of one urban area, and urban development is spilling over into Orange and San Bernardino Counties. Planners have had to cope with this complex jurisdictional situation in dealing with water supply and sewage, smog and other area-wide problems, and it is obvious that no effective transportation plan can ignore it. Within this great urban area, the average citizen's travel requirements take him across political boundaries almost daily.

The jurisdictional problems include: (1) dissimilar local traffic regulations; (2) multiple jurisdictions requiring the approval of several authorities where transit systems cross boundary lines; (3) inadequate coordination of local transit with area-wide systems of transportation; (4) jurisdictional rivalries and pride of office in one jurisdiction as against another.

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To these special characteristics must be added the Southern California climate, which favors year-round use of the automobile. Finally, the highly diverse travel pattern—with traffic moving in all directions and not primarily along a North-South or East-West axis—makes it difficult for transit lines to build up a load on any one route or to supply frequent and convenient service over a wide variety of routes; this further increases the use of private automobiles and dependence on them.

## History of Mass Transit in Southern California

IN ITS EARLY YEARS, the Pacific Electric Railway provided swift and efficient service between the central business district and outlying areas. In 1900, the PE made the trip from Los Angeles to Long Beach in less time than it takes today. Between the turn of the century and the early 1920's, population growth tended to develop along these rail routes. From the 1920's on, the mass-produced automobile made real estate development and residence location increasingly independent of rail transportation. As roads were built to accommodate the automobile, the PE found its schedules slowed down more and more as its original right of way, with few crossings, was cut by increased crossways, greater auto traffic, and the necessity for more passenger stops. Today the once efficient passenger service of the Pacific Electric rail system is in the final stages of being abandoned.

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The numerous narrow gauge trolley lines which supplemented the PE system at the turn of the century were merged into the Los Angeles Railway Company in 1910 by Henry E. Huntington. He further extended these lines into such communities as Huntington Park, Inglewood and Garvanza (now Highland Park) in order to promote his extensive real estate holdings in these areas.

By 1926, the bus was coming into its own as competitor of the trolley. In the years since 1926, trolley and rail lines have been increasingly replaced by busses so that today the Metropolitan Coach Lines (successor to the passenger service of the PE) runs busses on all but six of its 40 lines. Fares, however, have risen steadily. Patronage has fallen even while the community has been growing.

During World War II, the mass transit lines, because of automobile shortages and gas rationing, temporarily gained a new lease on life and proved their ability to move large numbers of people. Dependence on the private auto was so established in this area, however, that the government had to relax restrictions on gasoline and tires in order to enable

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workers to get to vital war plants; it took both the private auto and mass transit to meet the requirements of worker transportation. A measure of the scattered travel requirements at that time is the fact that caroccupancy never exceeded 1.75 passengers per auto, despite employerregulated car pools, appeals to patriotism, and wartime controls.

Postwar relaxation of controls brought an upsurge in private car use, with increased traffic congestion and rising accident tolls. Business decentralization was accelerated, shopping centers sprang up in new residential areas, and, by 1949, the great freeway building program was underway.

After the war, the transit companies made further improvements, modernizing busses and replacing some heavily travelled trolley rail lines with electric trolley coaches. But, in general, the mass transit system failed to provide facilities attractive enough to compete with the increasingly convenient modern automobile. The result has been a further decline in the use of mass transit, a decline which has not yet been reversed.

Existing transit lines, under the management of 21 transit companies, often do not provide transfers and trip diversification. Anyone who has tried to utilize public transit along other than established grooves of travel is witness to this difficulty.

Although our transit is no slower on a miles-per-hour basis than that of other cities, our great distances make the speed of present transit inadequate, particularly if public lines are to compete with the automobile. In addition, many observers believe that the discomfort, especially during rush hours, of present facilities is a major deterrent to greater patronage.

One further development has been the routing of busses on some of the new freeways. Increased speed and efficiency seems to have brought patronage to these routes and, as will be seen, some people now advocate busses-on-freeways as a major contribution to solution of the area's transit problem. To date, however, the trend of the area as a whole has been toward greater, rather than less, dependence on the private automobile.

Although the convenience and other advantages of the private automobile are readily apparent, dependence upon it is not without its disadvantages to the individual motorist and to the community. Most obvious of the disadvantages to the individual is the cost of operation. Major among the disadvantages to the community are the costs of providiog freeways, highways and parking facilities and the difficulty and cost of regulating an ever-increasing flow of traffic. The fact that these disadvantages increase as population grows and as the number of automobiles multiplies gives rise to the recurrent demands for a solution to the problem of traffic and transit.

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## The Penalty for Failure to Provide Adequate Public Transit

A FATALIST MIGHT SAY, "We may not get around as rapidly, cheaply, safely or comfortably as we might like, but we do get around. Why try to do anything about it?"

The answer is simple. Traffic congestion will inevitably grow worse, as more people and more automobiles pour into Los Angeles. In fact, beyond a certain point, the traffic situation is likely to deteriorate in more than direct ratio to the increase in population and automobiles. Once that point has been reached, traffic congestion will become a major deterrent to further community growth. Inadequate transportation facilities will reduce the labor force available to the industrialist and the range of potential customers available to retail stores. People will find Los Angeles a less attractive place in which to live and work, and business establishments will tend to locate elsewhere.

Those cultural, recreational and merchandising activities which can best be conducted at the center of a large urban area will be further handicapped by the continuing deterioration of the central district. People will be forced to travel longer distances. The tendency will be for the traffic and transit problem to become self-perpetuating and self-aggravating.

## Efforts of Other Major Areas to Solve the Problem

Los ANGELES make take some slight comfort from the fact that virtually every other major metropolitan area is having equal or greater difficulty in overcoming its transportation problem. Traffic congestion in older and more concentrated communities has, in some cases, made public transportation other than on private right of way a sort of crawling nightmare. Everywhere, the private auto has tied up roads and hurt mass transit facilities.

A variety of corrective measures are being applied across the country. Most of them appear to favor the use of rapid transit facilities on private rights of way, but high cost and limited demand have obstructed this solution. Millions of dollars are being spent for freeways, grade separated rail facilities, street-widening, parking lots and the like. Often these improvements have merely attracted more vehicles, caused more congestion, and compounded existing problems.

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Rail lines in other metropolitan areas, as in Los Angeles, have given way in great part to busses or trolley coaches, and efforts have been made to control rigidly the costs of operation, and to build faster and larger carriers.

Where rapid transit systems are being built or expanded, it is often on established sites or from already begun projects. Philadelphia is completing the Locust Street subway which had been started many years ago. Boston is fulfilling previous commitments in subway and overhead rapid transit, and Chicago is extending some of its lines. Cleveland is laying rail and building overhead on grade separation structures built some years ago. In many cases, freeways are being planned to serve the same general areas served by transit facilities.

It is perhaps significant that all of the above are government-financed projects. The general feeling in other metropolitan areas is that rapid transit projects cannot be justified to private enterprise on the basis of revenues alone. The disparity between investment and possible revenue, together with increasing competition from the automobile, make private capital unwilling or unable to shoulder the financial burden. No major rapid transit system in the United States has been built by private enterprise since 1907.

## Transit Proposals for Los Angeles

OVER THE YEARS, a variety of solutions and partial solutions for the Los Angeles traffic and transit problem have been advocated. Yet there has always been, in the words of the University Presidents' Report of 1950, "a divergence of opinion regarding transportation of such magnitude as to paralyze action."

Much the same situation prevails today. The field is crowded with suggestions, some of which we will examine briefly. Those who believe that bus service can adequately handle growing transit needs argue that the city, because of its nature, cannot support a rail rapid transit system. They approve of an accelerated freeway program, with provision made for busses to utilize the new roads.

Rail advocates agree as to the necessity of mass rapid transit, but are divided between the below-ground and the above-ground schools. Other divisions of opinion cleave the rail rapid transit enthusiasts, at whose extremes are the single-line advocates (such as monorail) and the comprehensive mesh or grid-pattern planners (such as the Babcock subway proposal).

In the light of the difficulties of the Pacific Electric, few advocate increased use of trolley cars on public streets, although some foresee further use of electric trolley coaches, running on pneumatic tires rather than rails.

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## \*Arguments For and Against Particular Transit Proposals

#### EXPRESS BUSSES ON FREEWAYS

The proposal for expanding the use of busses on the freeways contemplates that busses would move at the speed of other traffic, picking up and dropping passengers in service roadways or bus turnouts. At either end of their run busses would leave the freeways and in some cases operate for a distance on surface streets. Outlying freeway bus stops might take on the aspect of suburban transit stations, with riders arriving at and leaving such stops via private automobile or feeder busline, with some provision made for the parking of private cars.

#### Arguments presented for:

- 1. In this area of low population density, busses are the most economical type of transit.
- 2. They can be operated on a profitable basis by privately owned, taxpaying transit companies.
- To the extent that freeway-users ride in busses rather than in private autos, freeway congestion will be relieved.
- 4. A minimum of additional taxes will be required.
- Busses provide the most flexible type of transit since they can be re-routed as required by changing needs and conditions.
- 6. Busses can swing off the freeway and take passengers closer to their destinations than can a fixed rapid transit system.

#### Arguments presented against:

- 1. At the present rate of construction, the contemplated freeway system may not be completed for another quarter of a century.
- 2. Even after the freeway system has been completed, many areas will not be within a reasonable distance of freeways.
- 3. Adding bus traffic to auto and truck traffic on the freeways will increase the accident hazard and make more difficult the use of the freeways by those for whom they were primarily built.
- Freeways alone cannot solve the problem of traffic congestion, particularly in view of anticipated increases in population and in the number of private motor vehicles.
- 5. Busses on freeways are not as satisfactory as transit vehicles operating on their own rights of way. One auto, stalled on a freeway

during a peak traffic period, can seriously disrupt bus schedules. Because of the lack of an assured saving in time, busses on freeways will not attract passengers away from their private automobiles:

#### RAIL RAPID TRANSIT ON FREEWAYS

The Rapid Transit Action Group, a locally organized committee, recommended in 1948 that rail rapid transit be incorporated in center strips of those freeways where the load would warrant, that bus lines be put on other freeways, and that a subway be constructed under Broadway to serve the downtown area. Although features of other transit plans were included, the key proposal was the rail lines within the freeways.

Estimating the cost of such a system at \$310,000,000, the group recommended public financing in the belief that private financing would not be feasible.

Arguments presented for:

- 1. A rail system would carry more passengers and carry them more rapidly than would a bus system. It would be in a better position to attract passengers away from their private automobiles.
- It would be less expensive to construct a rail rapid transit system in conjunction with freeways, simply acquiring a wider right of way, than to construct such a system separately.
- 3. Freeways are planned to coincide with, or closely parallel, the main routes of travel. These are also the most suitable routes for rail rapid transit.

#### Arguments presented against:

- The major freeways connecting with the central portion of the city have been built without rail lines; it is now too late to consider this proposal even if it would have been feasible at the time it was first proposed.
- Rail rapid transit operates at a deficit in cities with much higher population density. It could not possibly pay its way in Los Angeles.
- 3. The gasoline taxes which finance the freeways can, under present laws, be used, and should be used, only for roads and highways. Land for freeways is acquired and freeways are constructed as funds from the gasoline tax become available. To try to tie in with this acquisition and construction program the program necessary for rail transit would be extremely difficult if not impossible and would greatly handicap and delay the freeway program.

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4. The public financing required points to the probability of public ownership and operation, a transit bureaucracy and a transit issue in local politics.

#### MONORAIL RAPID TRANSIT

Monorail, as its name implies, consists of a single overhead rail, from which are suspended electric trains, capable of fast rates of speed. The rail line can run over freeways, streets, or private rights of way. It can be fed by bus lines at the stations along its route.

In 1951, the State Legislature created a Metropolitan Transit Authority, authorized to study the feasibility of monorail rapid transit along a route to be within a specified eight-mile wide strip running from the San Fernando Valley to Long Beach. The Authority employed the engineering firm of Coverdale and Colpitts, whose report suggested the feasibility of the monorail proposal providing that the financing could be accomplished through tax exempt bonds and providing that the monorail operation would be free of regulation by the State Public Utilities Commission.

The route recommended stretched from Panorama City in the San Fernando Valley through Hollywood, through downtown Los Angeles (partly by subway) and then to Long Beach. There would be 17 stations along the 45.7 mile route. Most stations would be provided with parking lots for 325 cars.

Trains of six cars, each seating 67 passengers, would be operated at an average speed of 41 miles per hour over the length of the line and at three-minute intervals during peak hours. The system is estimated capable of handling 79,000,000 passengers a year. The cost of the system is estimated at \$165,000,000.

#### Arguments presented for:

- 1. Monorail provides the speed, safety and carrying capacity of a rail rapid transit system operating on its own right of way and at the same time avoids the excessive costs involved in construction of a subway system or in the acquisition of right of way for a surface rail system.
- 2. Monorail requires a minimum of structure and operates in relative silence; objections to an elevated railroad do not apply.
- 3. Construction, operating and maintenance costs are low. Because of the unparalleled safety of monorail operation, insurance costs—an important cost factor in the operation of bus and streetcar lines will also be low.
- 4. Although this particular monorail proposal does not include a comprehensive system for all parts of the community, half of the

population of Los Angeles County is situated close enough to the proposed route to be served by the line itself, independently or in conjunction with feeder bus lines.

- 5. The proposed monorail line can be completed in the relatively short period of four years.
- 6. Special treatment in tax-exempt financing and in exemption of monorail operation from Public Utility Commission regulation is justified by the amount of good that the monorail system will accomplish for the community.

#### Arguments presented against:

- 1. This monorail proposal is not a mass transit system, but merely a single line. It would serve only about 15% of present transit patrons in the metropolitan area. It would depend upon surface lines for transfer passengers but there is no demonstration that surface transit operations could be or would be coordinated or that transfer privileges would be feasible. If transfer privileges were not available, a pasenger having to pay a local bus fare at both ends of his monorail trip might well find it less expensive to drive his own car.
- 2. Monorail might fail to pay its own way and at the same time do great damage to existing transit operations by competing with their more favorable routes.
- 3. It is doubtful that the factors which make an elevated line damaging to property values can be eliminated in the case of monorail. Cost of construction might be raised to unforeseeable heights by damages accruing to owners of adjacent property.
- 4. The only existing monorail line was built in Germany around the turn of the century. In the fifty years since no one has found monorail an advantageous answer to a transit problem. Before a commitment to monorail is made, further study should be made as to whether it has in fact any engineering or economic advantages over conventional grade-separated rail transit systems. There is no conclusive engineering opinion that it has such advantages.
- 5. Granting tax-exemption and exemption from rate-fixing control is too high a price to pay for a monorail system.

#### SUBWAY GRID PLAN

A system of single-track, one-way loop subways has been proposed by Henry A. Babcock, consulting engineer, for the central part of the Los Angeles Metropolitan area, with surface transit to make connections for outlying communities. A new type of subway system, designed to meet the needs of Los Angeles, would be built in a mesh pattern, instead

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of trying to adopt here the radial pattern in such cities as New York. The stations would be located on one-mile centers, approximately equidistant in all directions, so that no one would have more than a few blocks to walk to a station. Within the squares formed by the intersections of the East-West and the North-South loops, local trains would run in circles. By synchronizing the operation of the local trains with that of the trains on the main loops, it would be possible for a passenger to travel, with not more than two changes, in any direction with equal facility. In the core area, all or almost all public transit could be handled by the subway system. It could be extended outward as conditions warrant; in the interim; the trains could run on the surface or on elevated structure in the outlying areas.

The cost of such a system, covering the 175 square mile area of Los Angeles, would be about a billion dollars.

#### Arguments presented for:

- 1. Los Angeles is one of the largest and can be one of the most modern of the world's cities. It must think and plan accordingly. Half-way solutions will only make the present situation worse and irretrievably handicap the city's future.
- 2. The main requirement of an adequate transit system for this dispersed community is that it permit passengers to go in a reasonably rapid and direct manner from any section of the city to any other section. Neither existing transit lines, other transit proposals nor the private automobile, even after freeway completion, can fulfill this basic requirement.
- No other transit proposal offers to free the streets of bus and trolley traffic and make them available for those who drive their own cars.
- 4. The cost is not disproportionate to what would be accomplished.

#### Arguments presented against:

- 1. Los Angeles cannot afford to stake its transit future on a blueprint. This is a completely untried proposal and, in the several years since it was first advanced, has failed to attract any significant support.
- 2. The always high costs of subway construction would be added to in this proposal in that carrying out the pattern required for the proposed type of synchronized operation would mean condemnation of private property.
- 3. People who have to ride in subways in Eastern cities intensely dislike doing so. Building subways in Los Angeles would be the poorest possible way of attempting to get people to use public transit instead of operating their own automobiles.

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## Criteria of an Adequate Solution

IN JUDGING the foregoing and other proposals for the solution of the traffic and transit problem of our area, it is desirable to have in mind standards for judging their desirability and adequacy. While it may be difficult for any one proposal to meet all of the following suggested criteria, presence or absence of the ability to meet most of them is likely to determine the success or failure of the proposal. The following criteria are suggested:

- (A) An adequate solution must be formulated on the basis of impartial findings by a body uncommitted to any particular solution.
- (B) It must be acceptable to and supported by the community as a whole.
- (c) It must be area-wide, designed to cover and serve all parts of the metropolitan area.
- (D) It must consider the movement of goods as well as of people.
- (E) It must provide for the coordination of all forms of public transit.
- (F) It must be long-range, taking into account probable future growth and changes in the residential and industrial patterns of different areas.
- (G) It must be economically sound, weighed in terms not only of the transit facilities, but also of their effect on real estate values and on the future growth and development of Los Angeles.
- (H) It must include the basic legislative program necessary for its implementation.
- (1) It must include a reasonable timetable for the completion of the program.
- (J) The coordinated system must include the following elements:r. Fast transportation,
  - 2. Safety
  - 3. Convenience
  - 4. Comfort
  - 5. Adequate passenger capacity
  - Trip diversification-ability to get from any point within the traffic pattern to another in a reasonably direct manner.
- (x) It must be accompanied by an intensive campaign to encourage the public to use its facilities.

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## San Francisco Makes a Fresh Start

SAN FRANCISCO is now making a broad and comprehensive approach to its traffic and transit problem. A Bay Area Transit Commission was created by the State Legislature in 1951. This Commission is composed of 26 members, representing nine Bay Area counties. Its purpose is "to study and investigate rapid transit problems in the Bay Area, to aid the cities and counties in investigating their transit needs, to combine and correlate findings, and to develop a master, coordinated rapid transit plan, including the cost thereof."

The Commission, with its original appropriation of \$50,000, held 17 meetings, formed committees and advisory boards, and hired an engineering firm to report on current and estimated 1970 passenger movements, as well as to analyze previous studies on mass transit and highway transportation in the area.

At the end of 1953, the Commission made its preliminary report to the State Legislature and submitted a proposed draft of an Act for creating a Transit Authority.

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The preliminary report concluded that a rapid transit system in its own right of way, free of intersecting traffic, was necessary; that \$750,-000 should be spent over a three-year period in making studies and plans; that it is the joint responsibility of, and to the joint interest of, the State and the Bay Area; and that the Counties should share the cost with the State.

The Legislature thereupon appropriated \$400,000 and the Counties appropriated \$350,000 for the detailed study and plans. Since then a contract for a study and development of plans for rapid transit facilities until 1990 has been made with a New York firm.

San Francisco was able to approach the Legislature with the kind of internal unity which Los Angeles must achieve before progress can be made. Appropriate legislation and financing could probably be obtained by the Los Angeles area if its 46 cities and the county could coordinate their efforts.

## A Proposal for the Los Angeles Area

IN 1950, the Board of Supervisors of Los Angeles County asked the Presidents of the California Institute of Technology, the University of California, the University of Southern California, and Stanford University and the Provost of the University of California, Los Angeles, to make recommendation to them of an appropriate approach to a solution to the traffic and transit problem of this area. The University Presidents'

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Report recommended a comprehensive, area-wide study which would include investigation of (1) the county's pattern of growth; (2) the relationship of a coordinated rapid transit system to healthy economic development; (3) economic and engineering features of all possible rapid transit systems—busses on freeways, subways, rail on freeways, rail on private property, monorail or other; (4) where rapid transit is needed; (5) how the final plan should be financed and (6) how the system should be owned and operated.

This comprehensive, area-wide study has never been made and we do not yet have the facts on which to base a recommendation of a comprehensive, area-wide solution to our problem.

## Conclusions

OUR BASIC RECOMMENDATION is that a comprehensive study of traffic and transit problems in the Los Angeles Metropolitan Area be undertaken in 1955 under the direction of an Agency appointed for this purpose.

The State Legislature should be asked to enact whatever legislation is required to bring such an Agency into being.

The Legislature should be requested to provide this Agency with an initial appropriation to carry out the survey, with the requirement that the survey be completed in 1957.

À definite time schedule should be established for the entire program. The supporting financial program must be geared to that time schedule. A tentative timetable for an initial program to cover our needs for the next ten years might be as follows:

1955-Legislation authorizing investigation and study

- 1957-Completion of initial investigation and study; legislation authorizing programming and financing
- 1959-Completion of initial programming and financing.

Implementation of the program might well be started before 1959 and completion of the basic stages of the program should occur within three to five years after 1959.

The relatively slow progress being made in the Freeway Program, primarily because financing was not realistically geared to needs, can be avoided by proper coordination of the planning, financing, and, if construction is required, the construction aspects of the program.

The proposed Agency should be empowered to appoint such advisory committees as it finds desirable. One of these might well be a Citizens Committee, representative of the different sections of the metropolitan area and including civic, industrial and professional lead-

[19]

ers. Another might well be a committee of technical advisers, made up of government and private experts in different phases of the problem.

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The proposed Agency should have as part of its responsibility the alerting of the community to the needs of the area, to the consequences of failure to act and to the benefits which an appropriate solution would bring. If its recommendations are to result in action, the support of citizens in all parts of the metropolitan area will be required. For the same reason, the Agency must stay on the job until the program is planned, financed, and put into operation. If public support flags, so flags the program.

If a plan for enabling legislation is to be submitted to the Legislature in 1955, the citizens of the Los Angeles Metropolitan Area must join without delay in supporting such a proposal.

[ 20 ]

# All Choked Up



## HEAVY TRAFFIC, DIRTY AIR AND THE RISK TO NEW YORKERS

MARCH 2007



## **ENVIRONMENTAL DEFENSE**

finding the ways that work

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Environmental Defense is dedicated to protecting the environmental rights of all people, including the right to clean air, clean water, healthy food and flourishing ecosystems. Guided by science, we work to create practical solutions that win lasting political, economic and social support because they are nonpartisan, cost-effective and fair.

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### **Executive summary**

New York is a city of superlatives. It's America's oldest big city and a place that's constantly reinventing itself. It's a place where millions of people raise their families and build careers, a destination spot for tourists and immigrants from around the world, and a cultural and financial center. Over the next quarter of a century, the city's population is expected to grow by nearly a million people, with 750,000 new jobs helping to boost the economy.

City streets are congested, smog and soot reduction goals are not being met, and transit is overcrowded. How will the city handle this growth? What are the implications for traffic, air pollution and our health? This paper addresses a critically important aspect of this challenge: the threat to New Yorkers' health posed by air pollution from traffic.

Recent science suggests there is a 500-foot or greater risk zone from air pollution around heavily used roadways. Within this risk zone, vehicle emissions are concentrated at levels higher than background concentrations, and the risks of various diseases, including cancer, heart disease, and respiratory ailments, can increase. The traffic pollutants especially relevant to health include particulate matter (soot), volatile organic compounds and nitrogen oxides (precursors to smog).

These risk zones have a significant impact on New Yorkers. Over two million people live within 500 feet of a congested street or highway. Furthermore, large numbers of health facilities, schools, and playgrounds are located within this 500-foot zone. A city as densely constructed and populated as New York must take notice of the health risks from motor vehicle air pollution and act to reduce them.

Congestion pricing systems are a key part of the solution. Such systems have already been implemented in London, Singapore and Scandinavia with impressive results. Their benefits include improved air quality and increased funding for new transit. A part of the solution must be to clean up the dirtiest vehicles on the roads by replacing old engines, filtering vehicles' emissions, and enforcing existing laws designed to reduce pollution. In addition to these actions directed to reduce motor vehicle air pollution, we call for expanded air quality monitoring to help scientists and policymakers better understand differences among local microenvironments.

## Health consequences of traffic: A compelling science story

Science has long shown that air pollution from trucks and cars is bad for health. To date, federal air pollution regulations have tended to focus on regional or city-wide pollution targets, rather than street-level exposures.<sup>1</sup> In the last decade, a growing number of researchers around the world have examined the actual street-level exposures to air pollution. This science points to local health risks more severe than ambient air pollution measures would suggest.

A critical mass of scientific evidence shows a health risk zone close to major roadways. The risk zone extends from about 500 to 1500 feet, varying by pollutant and health effect. For New York this means that people living within two to six blocks of a busy road are likely at higher risk. The core scientific studies that point to the health implications outlined in this report are divided into two categories. Some studies measure the actual street-level air pollutant exposures; others document the impaired health of people living close to roads. The health effects seen with greater intensity closer to busy roads include cancer, heart disease, impaired childhood lung development, asthma attacks and lung disease in adults.

#### The risk zone

Over the last ten years, there has been an accumulation of public health studies showing that air pollution exposure levels are greater close to roadways than are typically reported through regional air pollution measurements. There will always be some variability, because traffic pollution is affected by the mix of vehicles on a roadway, wind and weather, topography, and the buildings around the roads. Congestion itself has an effect: Stop-and-go traffic releases as much as three times the pollution of free-flowing traffic.<sup>2</sup>

Dr. Ying Zhou and Dr. Jonathan Levy, researchers at the Harvard School of Public Health (HSPH), recently synthesized much of the related research from the last decade. They concluded that there is a zone of increased exposures surrounding major roadways, i.e. an area in which increased health risks would be expected. The synthesis was based on 30 peer-reviewed studies and three government regulatory reports that characterized how air pollution levels and health risks changed with distance from a roadway. It identified the factors that would potentially influence the findings, including distance from the road, type of pollutant, emission rates, background pollution concentrations, and meteorological conditions.

Zhou and Levy concluded that the size of the area around the road where pollution levels were noticeably higher varied by pollutant. For the following three trafficrelated pollutants known to cause health problems, they summarized the distance from the road where levels are high enough to increase health risks.

- Particulate matter (soot from gasoline or diesel): 500 to 1500 feet
- Nitrogen dioxide (NO<sub>2</sub>): 600 to 1500 feet
- Ultrafine particle count (the smallest soot particles): 300 to 1000 feet

Taking all the different traffic-related pollutants as a whole, a risk zone of 500 to 1500 feet around a major roadway is supported by this meta-study.

#### FIGURE 1 Traffic spreads pollution up to 1500 feet from the roadway



Tailpipe pollution can travel 1500 feet or farther from the roadway. Three pollutants types and their impact range are depicted.

## Multiple health risks

Recent research has also inferred that there are increased health risks and harmful health effects within the pollutant dispersion zone. Researchers have looked at different groups of people, health effects, and distances from the roadway. Studies of men, women and children all show increased health risks associated with job-related and residential proximity to a busy road.

As a whole, the traffic and health studies present a wide range of health effects. Most commonly studied have been asthma and lung disease (especially in children), and heart disease. Traffic emissions, and especially diesel soot, are widely implicated in triggering asthma attacks and impairing lung function. Some studies have found associations between traffic-related exposures and stroke, cancers, including childhood leukemia, and adverse reproductive outcomes. Outlined below is some of the recent science:

- *Childhood Respiratory Consequences:* Children are especially vulnerable to the effects of traffic-related air pollution; studies show increased prevalence of asthma,<sup>3,4</sup> respiratory symptoms, <sup>5,6</sup> and stunted lung development. <sup>7</sup> A key study from 2005 found that the risk of asthma increased 89% for each quarter-mile closer children lived to a major roadway; the follow-up 2007 study found decreased lung air flow function for children living within about 1500 feet of a major roadway. <sup>8</sup>
- *Cancer Risks:* Higher exposure to traffic emissions was associated with increased risk of breast cancer among women in Erie and Niagara Counties of New York State.<sup>9</sup> A study in Stockholm found a 40% increase in lung cancer risk for the group with the highest average traffic-related NO<sub>2</sub> exposure.<sup>10</sup> A Danish study reported rates of Hodgkin's disease increasing by 51% in children whose mothers were exposed to higher levels of NO<sub>2</sub> during pregnancy.<sup>11</sup> Although some studies

have not shown associations, some studies have shown links between traffic and cancer.

- *Heart Disease:* A Los Angeles study found that if researchers more accurately estimate exposures, based on localized rather than ambient air pollution levels, estimates of risk of death from heart attacks triple.<sup>12</sup> Another study from Worcester, Massachusetts found a five percent increased risk of acute heart attack for each kilometer closer a subject lived to a major roadway.<sup>13</sup>
- *Dangerous Diesel Concentrations:* Multiple studies have found serious health effects from exposure to heavy-duty diesel trucks, including increased mortality rates. Diesel emissions on busy roads have been associated with triggering asthma attacks, and may play a role in the initial onset of asthma.<sup>14</sup>

#### FIGURE 2 Health findings near traffic



Many researchers have published findings of significant health effects related to proximity to traffic. The studies differ in selection of sample groups, exposure indicators, and other variables. Taken as a whole, these studies show effects from 300 feet to as far as 1500 feet away from busy traffic.

## **Implications for New York City**

The science described above is of special concern in large cities like New York, where millions of people live, work and play close to heavy traffic. New Yorkers are particularly vulnerable, given the city's combination of an extremely dense population and many local roads that carry large volumes of traffic. Also, it is important to note that even the background air quality in New York City does not yet meet key Clean Air Act standards for nitrogen oxides and particulate matter.

### Many New Yorkers at risk

As a first step toward understanding the scale of the potential threat in New York City, the maps in the Appendix to this report seek to paint an initial picture of the scale of the problem. Based on the science described above, we mapped a simple 500-foot risk zone around the city's most congested streets, which were selected based on criteria used by the New York Metropolitan Transportation Council that define heavily congested and high volume streets. To be conservative, 500 feet was selected because it is at the lower end of the dispersion distances found in the scientific literature. As shown above, different pollutants may have even larger zones of impact. For this report, local wind, weather, seasonal changes, and building heights were not accounted for when mapping the zones;

these factors can create variations in concentrations. Future research can answer questions about differences in specific exposures from street to street.

Combining census data with this simple and conservative view of the risk zone, startling results emerged:

- *People*: Two million people in New York City live within 500 feet of major roadways. The census data used was based on residential use only; people working in these zones were not included. In Manhattan, over 75% of the total population lives within 500 feet of a congested road.
- *Places*: Many facilities catering to sensitive populations, like schools and standalone playgrounds, are also inside these zones. For example, in Brooklyn, over 35% of both health facilities and standalone playgrounds are within this 500-foot risk zone. The maps in Figure 3 and the Appendix show the percentage of children, elderly and minorities that live within the 500 foot risk zone in each borough. Table 1 shows the absolute number of individuals affected; Table A-1 in the Appendix provides this information in percentages. In the Bronx, these risk zones comprise 23% of the borough's land area.
- *Sensitive populations*: Risk zones were mapped for busy roads in all five boroughs. Figure 3 shows the 500-foot zone for the Manhattan population 18 years of age and younger. Populations minority populations and people 65 years of age and older were also mapped (see Appendix). Deeper colors show higher proportions of the mapped population.

New York City borough	Total population in risk zone	18 years and younger	65 years and over	Minority
Bronx	218,900	66,700	24,900	143,200
Brooklyn	595,700	158,800	61,300	399,100
Manhattan	1,217,700	204,000	149,200	515,400
Queens	379,300	85,200	51,800	211,700
Staten Island	36,300	9,300	4,100	6,200
TOTAL	2,447,900	521,000	291,300	1,276,600

### TABLE 1 Populations living in the traffic pollution risk zone

#### FIGURE 3 Children and youth at risk

This Manhattan map overlays the population 18 years of age and younger on the 500-foot zone. Deeper red colors show higher percentage of youth residential populations.

#### % of Population 18 and Under





#### **Risk and disease in New York City**

The second step in understanding the scale of the problem is looking at the disease rates and risks in New York City, which underscore the impact of traffic-related pollutants. The lifetime cancer risk due to diesel exhaust in both Bronx County and Queens County is over 900 times the acceptable EPA standard, while New York County's risk is over 3000<sup>15</sup> times that limit. Vehicle emissions contribute over 80% of the total cancer risk from hazardous air pollutants in New York City.<sup>16</sup> As described above, diesel emissions

have been associated with asthma and its symptoms. New York's asthma statistics are staggering: An astounding 300,000 children and 700,000 adults living in New York City have been diagnosed with asthma.<sup>17</sup> Furthermore, in 2000, New York City's children were twice as likely to be hospitalized for asthma as the average American child.<sup>18</sup> Since people with asthma are much more sensitive to air pollutants than people with healthy lungs, this means there are roughly a

#### **Health Facts:**

- 1 out of 8 New Yorkers has been diagnosed with asthma at some point in his or her life
- 300,000 children in NYC have been diagnosed with asthma.
- In 2000, NYC children were almost twice as likely to be hospitalized because of asthma attacks as the average U.S. child.
- Compared to over 3000 counties, Queens County's diesel pollution risk ranks as the 10<sup>th</sup> unhealthiest in the nation.
- 20-30% of children have been diagnosed with asthma in central Harlem, Central Brooklyn and the South Bronx; this is more than double the national average.

million New Yorkers who need special protection from noxious air.

#### **Rising traffic levels in New York**

Minimizing these health problems requires a two-pronged solution: managing traffic growth rates and cleaning up dirty vehicles. While New Yorkers have relatively low rates of car ownership and benefit from an extensive public transportation system, Manhattan is the only county in the country with more jobs than residents.<sup>19</sup> That means that many of those workers drive from or through the other boroughs, exacerbating existing traffic snarls throughout the city. Since the 1920s, vehicle travel into Manhattan south of 60<sup>th</sup>

Street (the Central Business District or CBD) has increased by an average of seven percent annually. If that trend continued for the next 25 years, it would mean one million vehicles per day entering the CBD.<sup>20</sup> Given the already high level of congestion, that volume of traffic would be untenable.

Even under scenarios that include traffic management improvements, vehicle-

miles traveled in the Bronx are expected to increase by almost ten percent, to ten million miles per day. In Queens, the average speed will drop to 13.8 miles per hour. Currently, drivers in the New York region spend more than the equivalent of a full work week each year stuck in traffic.<sup>21</sup> These increases in traffic and congestion require multifaceted actions to provide a healthy and livable New York for the twenty-first century.

#### **Congestion in New York:**

- wastes 200 million gallons of fuel annually
- costs \$13 billion in productivity losses, wasted fuel, travel costs, lost jobs
- spews 166,000 tons of pollutants each year
- slows average traffic speeds to just 8 mph in rush hour

## Solutions

Fortunately, solutions to this challenge exist – and in many cases, real-world examples of success point the way forward. There are essentially three different types of solutions: 1) Incentives, like congestion pricing, that encourage less driving at congested times and finance new transit; 2) Clean-vehicle technologies, especially targeting the oldest and dirtiest engines; and 3) Land-use rules and developer incentives that reduce the need to drive, and separate schools, homes and other sensitive populations from heavy traffic. A part of the solution must also be to continue refining the science with air pollution monitoring programs at the local level.

#### Congestion pricing for healthy urban centers and busy corridors

Cities around the world are beginning to use congestion pricing systems to cut traffic in their urban centers and along heavily used corridors. The idea is simple: Use a price signal, an electronically-collected toll, to charge drivers to use the most congested roads at the most congested times. Like airline ticket prices, prices can be made cheaper at off-peak times and higher at the most congested times. For big cities with congested central business districts, a "cordon" scheme like London's can reduce traffic and emissions in the urban center by giving drivers an incentive to drive into the city during off-peak times. For busy highway corridors, congestion pricing can be used to maintain a free flow of traffic. In all cases, revenues from pricing can be used to benefit travelers themselves, by helping to pay for innovative transit choices and faster travel. This section describes successful congestion pricing programs and draws some lessons for New York City.

London: Pricing in a World Financial Capital<sup>22</sup>

Starting in 2003, London gave its drivers a new incentive: It began charging them a premium to drive into the city's congested business district, where traffic gridlock was deemed to threaten the city's economic competitiveness and quality of life. A remarkable thing happened. Congestion quickly dropped an average of 30%. Average traffic speed increased 37%. Emissions of the most dangerous air pollutants and greenhouse gases have dropped. Particulate matter ( $PM_{10}$ ) emissions are down by 12%, as are nitrogen oxides

(NO<sub>x</sub>). Fossil fuel consumption and carbon dioxide (CO<sub>2</sub>) emissions are also down by 20%.  $^{23}$ 

London raised hundreds of millions of dollars in new revenue, which it invested in better transit, delivering immediate benefits to the commuters affected by the charge.



New buses, financed by the congestion charge, boosted bus ridership almost 40%. Use of bicycles has also increased. Initial public skepticism has turned into support, and London's Mayor Ken Livingston enjoyed popular re-election after adopting the charge.

A key point in the London experience is that neighboring areas have *not* received increased traffic. After a short adjustment period, a free ring road has traffic levels comparable to 2002 levels. This

is despite the fact that skeptics initially argued that traffic in neighboring areas would increase as drivers attempted to bypass the charge.

The net revenue from the system is substantial: For the 2006 fiscal year, the system generated \$250 million of revenue after capital and operating expenses. That money is dedicated to transit improvements. In fact, a key to London's success is that bus service was expanded to provide alternatives for commuters that might otherwise find it more convenient to drive. Not only that, but both existing and new bus lines provide shorter and more predictable travel times. This is despite a 37% increase in ridership. Taxis also move more quickly, yielding time and cost savings for passengers. Based on these successes, in February 2007, London doubled the size of the congestion pricing

#### The London system:<sup>24</sup>

- £8 (\$16US) charge in effect from 7:00-6:30pm Mon. – Fri.
- exemptions for certain vehicles such as taxis and emergency responders
- multiple payment options
- enforced by secure license plate snapshots
- penalties range from \$100-\$300

zone and is now considering plans to begin targeting its benefits more specifically to winning air pollution benefits for its neighborhoods.

A final measure of London's success is the satisfaction of those involved. Seventy-eight percent of charge payers are satisfied with the operation of the scheme. Of those who traveled to, or within the zone during the first year, 80% or more say measures such as ease of travel, crowding, stress, and safety are the same as before or better. Seventy-one percent of businesses reported that business has not been hurt.<sup>25</sup>

Singapore: Early leader in congestion pricing

Singapore was one of the first large cities to adopt congestion pricing, starting in 1975 with a flat-rate \$3 charge to enter the central business district (CBD) during morning rush hours. Later, this was mirrored with an afternoon rush hour charge for traffic exiting the CBD, a lower midday CBD charge, and a charge for use of the city's outer ring road during certain hours. Singapore established a more sophisticated per-entry charge in 1998 that varied the charges

Singapore highlights: 26

- 10 mph increase in average speed
- 25% fewer traffic accidents
- 45% reduction in traffic
- use of public transportation increased by almost 20%
- 176,400 fewer pounds of CO2 emitted

by time of day. A second cordon area focused on a major commercial center adjacent to the CBD was added in 2005.<sup>26</sup>

Today, toll rates at different locations change over the course of the day, and are raised or lowered every three months to keep roadways operating at the travel speeds producing optimal traffic flow. As a testament to the flexibility of the system, after finding that roads in some locations were not congested on Saturdays, those tolls were eliminated.

#### Stockholm: Another success story

Stockholm initiated a trial period of cordon pricing for its central city for the first half of 2006. As in London, positive results led to an increase in support. Before the trial, only 31% of residents were in favor of the congestion charge. Two months after the trial,

voters passed a referendum to reinstate the charge. A recent poll says 67% of respondents now agree, "It was good that the new government had decided to reintroduce the system."<sup>28</sup> Given its success, the congestion pricing system enjoys broad support from liberal and conservative political groups.

## Stockholm highlights:<sup>27</sup>

- Reduced traffic by 15%
- 10-14 percent reduction in CO<sub>2</sub> emission
- May prevent 30 premature deaths by reducing NO<sub>x</sub>



#### Norway: Pricing for three cities

Norway has put ring road charging systems into practice in several cities, including Oslo (the capital), Bergen, and Trondheim. Their systems yielded traffic reductions of about six to ten percent. Initial revenues tended to be invested in new roads, and Trondheim now also uses the money raised for projects such as bicycle paths and a fleet of free bicycles for public use. Times and charges vary between the cities, as does the size of the ring, but all use electronic transponders with manual payment mechanisms as an alternative. Currently, Oslo is considering a plan for a major expansion of their toll ring system to manage traffic and fund improved public transportation and roads. Leaders of Norway's two major political parties reached agreement some years ago to support the strategy.

#### Lessons for New York City

In the United States, the idea of using price signals to cut congestion is beginning to catch on. The U.S. Department of Transportation announced a \$130 million grant program in early 2007 to help cities cut congestion with tools like pricing. In New York City, the Hudson River crossings have had a higher toll at peak times since 2001. San Francisco is studying congestion pricing for its downtown.

In New York City, the key would be to design a system that: 1) delivers real traffic reduction to all boroughs, especially for communities already burdened with high traffic, congestion and asthma rates; and 2) helps finance much needed mass transit improvements, including new clean-fuel bus service to neighborhoods that don't have good subway access. We can learn from the systems and experiences described above, and apply them to New York's unique circumstances.

The benefits for health at the street level could be large. For example, the Partnership for New York City recently researched how a traffic reduction in Manhattan's CBD below 60<sup>th</sup> Street would affect traffic in the rest of the city.<sup>29</sup> It chose a traffic reduction of about 15%– comparable to what London achieved through congestion pricing in its own CBD. The modeling predicts that if traffic volumes (number of vehicle trips) to Manhattan's CBD were reduced by just 15%, traffic congestion (or vehicle hours traveled) in the zone would drop about 30% – similar to London's experience. An overall traffic volume reduction would result in decreased congestion and increased travel speeds. We estimate that the ensuing air pollution and climate benefits of such a change could be on a par with the benefits enjoyed by Londoners.

Equally remarkable, though, are the benefits that neighborhoods outside the CBD would likely experience. Because of New York's specific traffic patterns, traffic congestion is estimated to drop 25% or more in Long Island City and downtown Brooklyn, and 18% in the 125<sup>th</sup> Street corridor in Harlem.

The system would be expected to earn revenue – as much as \$500 million or more per year – that could be invested in transit: <sup>30</sup> new clean-fuel express bus lines to neighborhoods poorly served by transit and stalled projects like the Second Avenue Subway. Together, the reduction in traffic volume, the air quality benefits of reducing gridlock and the creation of new transit choices could bring a powerful package of benefits to all New Yorkers.

#### **Clean up engines**

Another way to reduce health-damaging exposures to mobile source pollutants is to clean up the emissions of the dirtiest vehicles on the road. There are three basic strategies that work here.

#### Replace the Dirtiest Fleets - and Spur Transitions to Hybrid and other Alternatives

The first step is to simply replace the oldest and dirtiest vehicles with newer ones that meet or exceed the most advanced federal emissions standards. In New York City today, for example, school buses can stay on the road for up to 18 years. Other states, including



New Jersey, have cut that retirement age to 12 years or less, spurring a switch to cleaner engines. For taxi, radio car and other fleets constantly on the road, switching to hybrids and other advanced technologies needs immediate policy support.

#### Retrofit Remaining Diesels with Filters

Diesel filter technology has proven very effective at cutting up to 90% of dangerous particulate matter emissions from diesel vehicles.<sup>31,32</sup> On a national basis, every dollar invested in retrofit technology yields \$13 in public health benefits.<sup>33</sup> For New

York, the value could be even higher since the city's population density is so high. New York City has already passed laws requiring public fleets and machinery used in the execution of public contracts to install best available retrofit technology. Several states have noted these benefits and are investing heavily in diesel clean-up measures.<sup>34</sup> For

example, California has committed \$140 million a year to this purpose through its Carl Moyer program.

Enforce Anti-Idling

Idling cars and trucks deliver levels of pollution often higher than moving vehicles. New York City already has anti-idling laws, but little is done to enforce them. The solutions exist: tasking city agencies with enforcement; finding ways for the public to report scofflaws; and, where appropriate, using technologies like electrified truck stops so that trucks that need to run on-board systems can do so without idling their diesel engines.

#### The role of siting and design

The American Academy of Pediatrics wrote in 2004: "Siting of school and childcare facilities should include consideration of proximity to roads with heavy traffic and other sources of air pollution. New schools should be located to avoid 'hot spots' of localized pollution."<sup>35</sup> In some places, government policy reflects this concern. For example, the science of impacts on children's heath motivated the state of California to prohibit the siting of schools within 500 feet of a highway.

Just last year, in one the country's most polluted valleys, the San Joaquin Valley Air Pollution Control District adopted a new incentive system to encourage developers to build in ways that minimize traffic pollution. The "Indirect Source Rule" calls on builders to either "build green" or to pay a per-unit fee that the air district then invests in local clean air measures. The "build green" incentive is focused specifically on reducing emissions, for example with transit-oriented development, safe bike paths and sidewalks.

#### FIGURE 5 **Air patterns in urban canyons**



Local variations in geography, meteorology, and building size can affect the exact pattern of air pollution distribution. For example, prevailing air circulation patterns can trap traffic pollution in urban canyons. This pollution can concentrate along city sidewalks where people walk and breathe. Adapted from the OSPM Model description.<sup>38</sup>

# Monitor local pollution: What do people actually breathe?

Current air quality monitors were established largely to understand overall regional air quality.<sup>36</sup> As described by the authors of a Los Angeles heart disease study, "The assessment of air pollution exposure using only community average concentrations likely underestimates the health burden attributable to elevated concentrations in the vicinity of sources. [T]hese effects are diminished when using average concentrations for the entire community."37 The EPA recommends placing air monitors away from "hot spots" like heavily used roadways: "EPA believes it is not appropriate to specifically require any number of monitors to be placed in microenvironment or hot spot locations." 39

Local variations in topography, wind patterns, and other physical features like

"urban canyons" (see Figure 5) can work to concentrate pollutants, shift risk zones or otherwise alter the precise spatial characteristics of exposure. In big cities, millions of people live, work and play directly in these microenvironments. While there are a growing number of traffic and health studies, few combine actual monitored values with health effects. Improving roadside monitoring systems will allow for better understanding of health effects and show if people near roadways are at levels exceeding standards.

This paper has outlined practical solutions that can achieve these goals. City and local governments now have a unique opportunity to step in and protect their citizens.

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<sup>37</sup> M. Jerrett, M.,R.T. Burnett, R. Ma, C.A. Pope III, D. Krewski, K.B. Newbold, G. Thurston, Y. Shi, N. Finkelstein, E.E. Calle, and M.J. Thun, "Spatial Analysis of Air Pollution and Mortality in Los Angeles," *Epidemiology*, November 2005, 16, 727-736.

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## Mapping method

This Appendix includes maps of each borough. They were created with GIS (Geographic Information Systems) using spatial data from several sources. The health risk zones were mapped around busy roads using both highway classifications and traffic congestion information. First, U.S. Census Bureau classifications for interstate and state highways, class A10-A25, were mapped. These highways are comparable to those shown to have health impacts in the public health literature. Second, heavily congested streets were added to the maps. Congested streets were determined using New York Metropolitan Transportation Council (NYMTC) information for peak morning and afternoon 4-hour periods.

Using these busy, congested roads, a 500-foot health risk zone was mapped around these corridors. Using data from the U.S. Census Bureau (year 2000 data at the block group level), information was gathered on the number, age and race of people in the zone. Minorities are all non-white racial groups as defined by the Census Bureau. The maps use color densities to show the percentage of people in each zone; the darker the color, the greater the percentage of people in that zone for the mapped population. For example, along the Bronx River Parkway (a risk zone), a very high percentage of people are aged 18 and younger, few are 65 and older.

The maps also include places where sensitive populations may be exposed to traffic pollution, such as public schools, playgrounds, and health facilities. This data came from New York City PLUTO files (2004) and is sourced from the Departments of City Planning (DCP) and Finance. PLUTO identifies the land use of whole parcels according to primary tax lot information. The schools are public elementary, junior high schools and senior high schools. Health facilities include hospitals, sanitariums, mental institutions, infirmaries, health centers, child centers, clinics, nursing homes, and adult care facilities.

As with all GIS mapping, we recognize that there may be limitations in the data sets and classifications. For example, given the way playgrounds are characterized by PLUTO, this category includes only standalone playgrounds, and not those on school grounds or located with other recreational facilities. By using this data set, we avoid "doublecounting" playgrounds. There are more playgrounds altogether, both inside and outside the risk zones we described.

Environmental Defense is continuing to refine the understanding of actual exposures in urban areas, especially in New York. Future air studies and GIS mapping runs will incorporate additional data sources to improve understanding of neighborhood-level exposure and health risks.

## **New York statistics**

These maps show the extensive potential health risks for New Yorkers. Table A-1 complements Table 1 in the report, giving the population results in percentages. Table A-2 summarizes the facility information related to where sensitive populations (i.e. children, elderly) might be located along with the land area in the risk zone; Table A-3 represents this information as a percentage, based on the data as presented in the databases described above.

TABLE A-1 Percentage of population living in the traffic pollution risk zone

New York City borough	Total population in risk zone	18 years and younger	65 years and over	Minority	
Bronx	16%	16%	18%	16%	
Brooklyn	24%	24%	22%	28%	
Manhattan	79%	75%	80%	73%	
Queens	17%	16%	13%	17%	
Staten Island	8%	8%	8%	6%	
TOTAL	31%	26%	28%	29%	

TABLE A-2

Number of facilities and land area in the traffic pollution risk zone

	Health facilities	Public schools	Standalone playgrounds	Land area (sq. mile)
Bronx	32	58	29	9.53
Brooklyn	129	133	59	16.18
Manhatta	n 147	176	70	17.63
Queens	71	56	25	21.00
Staten Is. <b>TOTAL</b>	5 <b>384</b>	5 <b>428</b>	3 <b>186</b>	5.63 <b>69.97</b>

TABLE A-3

Percentage of facilities and land area in the traffic pollution risk zone

	Health facilities	Public schools	Standalone playgrounds	Land area	
Bronx	19%	17%	22%	23%	
Brooklyn	36%	26%	38%	22%	
Manhattai	n 84%	73%	82%	77%	
Queens	39%	13%	29%	19%	
Staten Is.	10%	5%	8%	10%	
TOTAL	41%	27%	37%	23%	

# The Health Risk from Congestion in the Bronx

At-risk populations falling within 500 ft of the borough's congested roadways



# The Health Risk from Congestion in Brooklyn

At-risk populations falling within 500 ft of the borough's congested roadways



## Youth Population 18 and Under

% of Population 18 and Under





## Elderly Population 65 and Over

% of Population 65 and Over





## **Minority Population**

% of Population Considered Minority

	0% - 20%
	21% - 40%
	41% - 60%
	61% - 80%
	81% - 100%
0	Public Schools
	Playgrounds
	Health Facilities
	500 ft hot spot area

Minorites are considered to be all non-white racial groups as defined by the U.S. Census

## The Health Risk from Congestion in Manhattan

At-risk populations falling within 500 ft of the borough's congested roadways

75% of Youth Population (18 & under)

80% of Elderly (65 & over)

#### % of Population 18 and Under





#### % of Population 65 and Over





#### % of Population Considered Minority



## The Health Risk from Congestion in Queens

At-risk populations falling within 500 ft of the borough's congested roadways



## The Health Risk from Congestion in Staten Island

At-risk populations falling within 500 ft of the borough's congested roadways



## The Fix The City Lawsuit

Background, Goals and Implications

The Real Reason L.A.'s Infrastructure is Failing and Critical Services Are Being Slashed

#### **Executive Summary**

Infrastructure is a prerequisite for economic success of a city<sup>1</sup>. The prosperity of cities depends upon their livability: Good schools, safe parks, properly staffed police and fire, gridlock-free streets, clean air and sufficient water. In Los Angeles these vital public services are suffering in large part because the City of Los Angeles ("City"), with over 4 million people and growing, has failed to monitor and invest in its crumbling infrastructure and has allowed development to outpace and exceed its capacity to provide essential services. It did not have to be this way- at least according to the City.

"What became clear was that a crucial feature of dealing with growth impacts was contained in the General Plan Framework – its program for timing allowable development with available infrastructure..." - L.A. City Attorney's Office – May, 1998

Facing criticism from the U.S. Environmental Protection Agency and state agencies, the City sought to write a new General Plan in the early 90's. Their goal was to put in place some mechanism to ensure that essential City services were not overwhelmed by over-development. Their solution was quite elegant: Allow development based on the capacity of the infrastructure to sustain that development. In this way, the General Plan could "react" to changes such as earthquakes, financial stress or inaccurate growth projections by simply monitoring, reporting on and then reacting to changes in the infrastructure of the City, its services and its financial condition. If the capacity of the infrastructure or the City's ability to fund/expand the infrastructure changed, so too would the amount of allowable development.

The City Council approved the new General Plan in 1996 (re-adopted in 2001) including the implementation of its "<u>crucial</u>" new supermitigation that would be able to mitigate the potential significant impacts of the new General Plan. That mitigation, called the Infrastructure Mitigation throughout this document, involved combining monitoring data, city and non-city databases and the city's

"The policy requires that type, amount, and location of development be correlated with the provision of adequate supporting infrastructure and services." – City of L.A. General Plan

ability to fund improvements into an "Annual Report on Growth and Infrastructure." That Report forms the basis of the City's ability to implement the required mitigation of adding new infrastructure or implementing building controls if infrastructure becomes threatened. They said:

"Policies 3.3.2... contained in the General Plan Framework represent measures that would serve to lessen impacts relative to fire/EMS. Policy 3.3.2 directs monitoring of infrastructure and public service capacities to determine need within each CPA for improvements based upon planning standards. This policy also directs determinations of the level of growth that should correlate with the level of capital, facility, or service improvement that are necessary to accommodate that level of growth. In addition, the policy <u>directs the</u> establishment of programs for infrastructure and public service improvements to accommodate development in areas the General Plan Framework targets for growth. Lastly, <u>the policy requires that type</u>, amount, and location of development be correlated with the provision of adequate supporting infrastructure and services."

As testimony to the importance of this key feature, the City Council found that all other proposed alternatives to the adopted General Plan were <u>infeasible</u> because they did not contain the essential feedback mechanism – the Infrastructure Mitigation as informed by the Annual Report on Growth and Infrastructure. Once the City adopted the Infrastructure Mitigation via the Annual Report on Growth and Infrastructure as a mitigation measure, it became obligated by law to use it as described<sup>2</sup>. It further cannot simply choose to stop abiding by the mitigation nor can it remove the obligation without new environmental review and proof that the mitigation is no longer needed.

<sup>&</sup>lt;sup>1</sup> <u>http://citiesspeak.org/2011/03/18/state-of-the-cities-in-2011-infrastructure-a-prerequisite-for-economic-success/</u> <sup>2</sup> (Public Resources Code §21081.6), AB3170

When the City was sued on the validity of its new General Plan and its mitigations, it <u>cited</u> the Infrastructure Mitigation as the reason the General Plan was adopted properly. That lawsuit <u>ended</u> in 2001 (the City won based on its reliance on the Infrastructure Mitigation).

Right after winning the case in 2001, the Director of the Planning Department, Con Howe decided without any public outreach or authorization from the City Council, and in violation of the law(See footnotes 1-3), to terminate the Annual Report which enables the Infrastructure Mitigation requirement. This unilateral decision to strip the General Plan of the key method by which the City knows it can sustain more development set us down the road to where we find ourselves today: Furloughed firefighters, closed engine companies, gridlocked traffic, cash-strapped schools, water rationing, decreased park and library access and deteriorating water pipes, sidewalks and streets. (Con Howe now works for <u>CityView</u>, a major L.A. developer.)

While blindly approving project after project in the name of much-needed developer fees, the City chose to ignore a <u>report</u> by its own controller that stated that the cost of adding and maintaining infrastructure consumed by development exceeded the fees being collected. In other words, the City was losing money on every sale and trying to make it up in volume. This pyramid-scheme worked for a while, as pyramid schemes usually do. Unfortunately, the current down economy and sheer volume of deferred infrastructure maintenance has come home to roost, and Los Angeles residents and businesses are now all paying the price.

As a direct result of the City's failure to adhere to the law and the resulting infrastructure chaos, community leaders across the City have mounted an intervention for its development-addicted government. They filed lawsuits demanding that the City prepare and use the Infrastructure Report as required.

Infrastructure is critical. It means:

- **Police** can respond when there is crime and can patrol to prevent crime.
- Fire fighters and paramedics are properly funded and can respond in time to save lives.
- Schools have the resources to teach our kids.
- There is sufficient **water** for the residents of the City.
- Parks and Libraries can stay open more hours.
- Streets and sidewalks aren't allowed to deteriorate.
- Traffic isn't allowed to degenerate into gridlock.
- The City has the resources to handle natural disasters such as earthquakes.

Los Angeles has talked the urban planning talk, but it has not walked the implementation walk. It is running on empty and on the verge of bankruptcy. Fiscal and physical crises have merged to create the perfect municipal storm. The costs of deferred infrastructure maintenance are staggering: It will now require <u>billions</u> to bring the crumbling infrastructure up to date.

If the Mayor and the City Council had implemented the key <u>mitigation</u> of Los Angeles' General Plan which <u>requires</u> an Infrastructure Mitigation relying on the Annual Report for its data, this City would be in far better shape. The Infrastructure Mitigation was to direct the Planning Commission and City Council to <u>trigger</u> adjustments in development at the Community Plan level. That would mean saying "no" to some projects until investment in the City's infrastructure, including public safety, was assured. Unfortunately, "no" is not something that well-connected developers, lobbyists and consultants hear from the City.

Only proper planning, monitoring and action on the part of the City can ensure that the public receives adequate services and a livable City. By refusing to prepare and use the Infrastructure Report it had promised, the Mayor and City Council have betrayed the public trust and put its citizenry in harm's way.

The Fix The City lawsuit will force the City to obey the law and return the emphasis back to the needs of the current residents and businesses. This will be accomplished through implementation of required tracking and mitigation of

burgeoning growth, and ensuring that the infrastructure necessary, including streets, sewers, storm drains, firefighters, police, libraries, parks and other City services, is available.

This position paper discusses the specifics of the lawsuits, the General Plan and the essential mitigation called the Infrastructure Mitigation as informed by the "Annual Report on Growth and Infrastructure."

#### Introduction

"What became clear was that a crucial feature of dealing with growth impacts was contained in the General Plan Framework – its program for timing allowable development with available infrastructure..." <u>L.A. City Attorney Brief defending the General Plan Process and its now-abandoned policy.</u>

If only that "crucial feature" was still clear to the City, there would be no need for the current lawsuit. It was certainly clearer many years back when then-California Assemblyman Antonio Villaraigosa <u>voiced concern</u> about the General Plan process stating that "a root cause of the "disconnect" that exists between the government, the development community and the general public is the public's feeling that it does not have a meaningful role in the process." He then stated that this leads to a "politicization of the



"We have the worst cut-through traffic of any area of the City. It's due to the fact that development has continued without proper infrastructure." John Fisher, LADOT - WNC meeting: July, 2008

planning and permitting process" which leads to the "kind of erratic, project-based planning that aggravates everybody involved." We wonder where that Antonio Villaraigosa went.

When asked, the City will tell you the only reason our roads are crumbling, police hiring has been frozen, fire services have been cut, and water is being rationed is because of budgetary constraints as a result of the poor economy and Proposition 13.

In reality, the City' infrastructure problems are in large part the direct result of the City failing to put promised controls on development if sufficient infrastructure did not exist to support new development.

In Los Angeles, development approvals are used (<u>misguidedly</u>) to generate revenue with little consideration for protecting public health and safety and maintaining the livability of the City for its residents. In Los Angeles, the City constantly declares that major projects will have no significant impacts despite all evidence to the contrary. In fact, unlike any other business, the City allows developers to only state the (often theoretical) income that development will bring without discuss the other side of the ledger – the cost of supporting that growth. That failed approach is now bearing bitter fruit.

It wasn't supposed to be this way. Had development been based on the <u>availability of infrastructure</u> rather than the ability of some developers to game the approval process, we would not be facing the severe degradation in City services we now face. Instead, a ponzi-scheme dependence upon inadequate development fees has driven the City to exceed its capacity to protect public health and safety.

In order to control serious environmental impacts of projected growth and deteriorating infrastructure, the City installed a monitoring and mitigation program to track its growth and the impacts of that growth on the City infrastructure. The City went a step further with a policy that established a mechanism to inform City officials and the public on the impact of growth and mandated that building controls would be put into effect if the infrastructure was "threatened," not merely overburdened.

The mechanism designed by the City to prevent precisely the types of failures we are now seeing is called the Infrastructure Mitigation which was to be enabled and informed by the Annual Report on Growth and Infrastructure (ARGI). That report has never truly been created and the mitigation mechanism was never used as promised. Water main breaks, cuts in fire services, gridlocked traffic, water rationing, deteriorating streets and a freeze on hiring new

police officers is testimony to both the wisdom of planners in 1996 and the shortsightedness of all those who have ignored the requirements set forth in the General Plan since.

#### Statement of the problem

As stated by John Fisher of LADOT at a Westside Neighborhood Council meeting in July, 2008, we have problems because "development has continued without proper infrastructure."

The General Plan sought to solve this problem through a simple mechanism: Development controls should be put in place unless there is adequate infrastructure OR the City has the resources to construct adequate infrastructure within 12 months. This simple and effective mitigation was to be informed through something the City called the "Annual Report on Growth and Infrastructure." (ARGI)

"...if this monitoring finds that population in the Plan area is occurring faster than projected; and, that infrastructure resource capacities are threatened, particularly critical ones such as water and sewerage; and, that there is not a clear commitment to at least begin the necessary improvements within twelve months; then building controls should be put into effect, for all or portions of the West Los Angeles Community, until land use designations for the Community Plan and corresponding zoning are revised to limit development."

Various Community Plans – West L.A. Shown

Instead of implementing its required mitigation, the City has decided to overburden itself with new development that does not pay its way (<u>See Laura Chick Audit, March 23, 2009</u>). The audit states:

"City departments do not consistently track, plan or budget for maintenance of public improvements installed as a result of conditions of approval for development projects. In addition, some City departments do not collect sufficient fee revenues to cover the costs of maintaining public improvements.

Essentially, the City loses money on every sale but is trying to make it up in volume. In this Ponzi-scheme method of planning, more and more new projects are required to pay for the excesses of previous projects.

Unfortunately, as with any Ponzi-scheme, when new suckers can't be found, the scheme collapses. Just as with the Madoff scheme, when the economy faltered it exposed the City's scheme. When new projects don't come in to cover the costs of previous projects, budgets dry up and services are cut.

If, however, development was only allowed when infrastructure existed to support it, and if the City charged developers the actual costs to replace and maintain the infrastructure they consume, we would not be seeing the same level of police and fire budgets slashed, roads crumbling and crushing levels of traffic.

Development and growth consume infrastructure. Time creates the need for maintenance. Only proper planning, monitoring <u>and action</u> on the part of the City can make sure that the public receives adequate services and a livable City.

#### Brief history of the suit

One local community member was researching a project and sought to understand how the City makes its decisions on the regional impacts of a project (such as water consumption). He did research and found references in his community plan to the "Annual Report on Growth and Infrastructure."

His community plan stated:

"...<u>if this monitoring finds that</u> population in the Plan area is occurring faster than projected; and, that <u>infrastructure resource capacities are threatened</u>, particularly critical ones such as water and sewerage; <u>and,</u> <u>that there is not a clear commitment to at least begin the necessary improvements within twelve months; then</u> <u>building controls should be put into effect</u>, for all or portions of the West Los Angeles Community, until land use designations for the Community Plan and corresponding zoning are revised to limit development."

Fascinated, he went to the City's website and looked for the most recent version. The latest one he found: 1998. And that report didn't even contain the required information required to implement the Infrastructure Mitigation.

He then went to Gail Goldberg, then Director of Planning for the City, and asked about the Infrastructure Report and where he could find it. Her response? "Please don't sue me."

A group of community members, homeowner associations and neighborhood councils then asked the City to comply with the General Plan requirement. The City simultaneously refused to provide information and also stated that it had no such requirement to do the Infrastructure Report despite clear evidence to the contrary. The evidence submitted by the community was extensive, though no more clear evidence is required other than the unambiguous statement provided by the City itself – in its (incomplete) Infrastructure Reports.

<u>They said</u>: "The preparation of this report fulfills a requirement of the General Plan Framework Element to monitor growth and to report on the adequacy of supporting public services and infrastructure."

Faced with an intransigent City unwilling to follow the law and keep its promises, a group of community members from across Los Angeles filed suit as Fix The City.

#### A brief history of the Infrastructure Report and its purpose

The City's prior General Plan (the "Centers Concept") was a failure because it did not link goals and policies to actual programs for their implementation. This resulted in unrestrained and misdirected growth in the 1980's which created a strain on the City's ability to maintain infrastructure and avoid significant environmental impacts.

In an effort to learn from its earlier mistakes and change the course of direction, in the 1990's the City embarked upon a three year effort to develop a better General Plan -- culminating in the Framework Element in 1996. Yet after three years of public participation and refining and presumably expenditure of millions of taxpayer dollars<sup>3</sup>, the City now declares Planning Department staff persons may internally and unilaterally make fundamental changes to and even deletion of required mitigations, and that they may do so with unbridled discretion and without any public review, input or consideration.

Besides this prospect being a waste of taxpayer dollars invested, this is not a legally tenable position as the Infrastructure Mitigation as informed by the Annual Report is the mainstay mitigation of the General Plan and the key mechanism by which the City will ensure that growth does not degrade the environment or strain City infrastructure and services beyond capacity.

The purpose of the Infrastructure Mitigation is to provide the means to meter growth based on availability of infrastructure. Actually, the City stated it best when it said the Infrastructure Report is to be used "so that allowable increases in density … would not occur until infrastructure and its funding was available." (General Plan EIR, 1998)

This clear, unambiguous statement is essential to the proper functioning of the City: You can't allow new development if you don't have the infrastructure necessary to support the new development and can't pay to improve it.

The City was to accomplish this essential check-and-balance by monitoring actual growth and infrastructure capacity, comparing monitored data to projections and necessary infrastructure levels, and then by implementing building controls if any infrastructure element was threatened. The determination of "threat" would be based on trend lines and other data including the financial health of the City.

The Infrastructure Report is not just some document created to sit on a shelf to gather dust (or virtual dust on the internet) and be ignored by everyone. It provided the basis for implementation of <u>the active, key mitigation</u> that protected the City against the impacts of over-development and its predictable adverse impacts.

<sup>&</sup>lt;sup>3</sup> Framework Element put together as a result of over one hundred one-on-one interviews with community leaders, followed by eight community workshops, followed by 38 neighborhood workshops, followed by a Citywide Visions workshop, followed by an intensive Framework Project Team working session and a Gallery Walk in City Hall Forecourt to present and obtain feedback from the public, followed by another 16 workshops, followed by the Citywide Options Event and finally presentation to the public and decision makers for adoption and approval...

How do we know this? First, we know this because the City deemed other alternatives to the adopted General Plan <u>infeasible</u> precisely because they did not contain the Infrastructure Mitigation. Second, we know this from the City as it sought to defend its new General Plan during the environmental review process in the mid-1990's and also in court in 2001.

Some relevant quotes from the City in its General Plan EIR and related documents:

The Framework Element includes an on-going monitoring program to update the demographic forecasts that underpin the plan and its Environmental Impact Report (EIR). The monitoring system will result in the issuance of an Annual Report on Growth and Infrastructure which will be used to modify plan and EIR assumptions and serve as the basis for evaluating the effectiveness of the Framework Element's objectives, policies, programs, and mitigation measures.

Based on these considerations, it is the intent of the General Plan Framework to: establish a short-term estimate of population growth that can rationally be used for the planning and funding of infrastructure and services; to support growth and encourage patterns of development which reduce potential environmental impacts such as traffic congestion and air emissions; and to improve the quality of life for the City's residents. Recognizing that the demands and impacts of growth may vary due to changing characteristics of the population and technologies, it is the intent of the Framework to set in place a system to monitor and annually report growth demands and impacts as the basis for the implementation of strategies for their accommodation.

As stated above, the City specifically made the finding that all other General Plan alternatives were <u>infeasible</u> precisely because the other alternatives did not "include policies for managing growth and development in relationship to infrastructure capacity."

They were right. In fact, they stated that if this mitigation did not exist, "the greater amounts of permitted population, employment, and housing would result in more significant adverse environmental impacts." Guess what happened.

To be exceptionally clear: The Infrastructure Report was a <u>specific mitigation</u> the City <u>must follow</u>. In its approval of the General Plan, the City <u>stated</u>: *"The policy requires that type, amount, and location of development be correlated with the provision of adequate supporting infrastructure and services."* 

How strongly did the City feel about this mitigation? It was their <u>key argument</u> to the courts in the late 1990s on why the General Plan process was legally defensible.

The Hillside Federation had challenged the General Plan, saying that transportation mitigations were speculative as funding was uncertain. In response, the City argued that the Infrastructure Report and its "triggering mechanism" represented a mitigation that was not speculative and was under the City's control.

The City touted the Report and its mitigating effects in its briefs. The Hillside Federation won the first round of the legal process, but the City <u>prevailed in the appellate court</u> in 2001 based on their reliance on the Infrastructure Report.

Note that the City coincidentally stopped doing anything called the Infrastructure Report right after they won the appellate case. Ironically, the precise impacts predicted by the Hillside Federation have come to pass specifically because the City failed to implement the mitigation that was to have mitigated the impacts.

What did the City argue in its case against Hillside Federation? They stated: "Other alternatives were rejected because there weren't land use distribution policies or triggering mechanisms to time growth to infrastructure." They also stated that the alternative ultimately selected was <u>particularly helpful</u> because it informed the City that a triggering mechanism should be included so that increases in density "would not occur until infrastructure and its funding was available."

Finally, they made the case that the City's use of the Infrastructure Report was critical. They said "What <u>became clear</u> was that a crucial feature of dealing with growth impacts was contained in the General Plan – its program for timing allowable development with available infrastructure..."

We are where we are now, with crumbling water pipes, depleted fire service and crushing traffic because the City did not heed its own advice and keep its own promises

### The Infrastructure Mitigation – What is it?

The Infrastructure Mitigation was designed to be the mitigation that protected the City from developing beyond its means. The Annual Report was <u>the</u> document that City officials <u>and the public</u> use to determine if development should or should not be controlled.

The Annual Report is supposed to synthesize data from City and other non-City databases, monitoring programs, growth, population and resource availability into an easily accessible and understandable tool to determine whether or not the infrastructure can withstand more development.

Ultimately, the public's quality of life, the City's livability and the City's ability to provide basic public safety functions



depend on whether or not the City can afford to put more demands on its infrastructure.

The Report is supposed to synthesize vast amounts of raw data into policy-level analysis and actionable findings. Based on the City's own statements and <u>community plans</u>, the Infrastructure Report is to determine whether any infrastructure element is threatened. This process includes determining triggers or thresholds which indicate an infrastructure element is threatened and then comparing actual conditions to the trigger levels.

As described by the City, it is a:

"...<u>mechanism for ' ... regulating the type, location, and/or timing of development, when ... additional</u> infrastructure and services have been provided, and there remains inadequate public infrastructure or service to support land use development (Policy 3.3.2[ d]).' to respond to such impacts."

**What it is not**: As the Fix The City lawsuits have progressed, the City has tried to confuse the courts by claiming that over 60 distinct websites containing over 15,000 pages of raw data from disparate Citywide databases, capital improvement budgets and monitoring data is the required Infrastructure Report<sup>4</sup>. They couldn't be more clearly wrong – and they know it.

First, simply acquiring raw data has <u>no mitigating effect</u>. Similarly, issuing findings without then acting on those findings has no mitigating effect. That's just simple logic. However, some might want to see the proof in writing.

Fortunately, the City has provided that proof. They clearly listed <u>four elements</u> as separate and distinct. Those elements are a 1) monitoring program, 2) a Citywide environmental database, 3) capital improvement programs and 4) the Infrastructure Report.

The description of the Infrastructure Report provided by the City clearly indicates that the Infrastructure Report contains data FROM the monitoring program and therefore is not the same as the monitoring program.

<sup>&</sup>lt;sup>4</sup>. The City presented the court with 60 website links (some broken) to over 15000 pages of raw data and claimed that it represented the Infrastructure Report.

The Infrastructure Mitigation is NOT a discretionary policy that can be ignored. We know this <u>because the City said so</u>. In response to a question about the City's commitment to implementing the mitigation(by a different City agency – the Bureau of Engineering), the City <u>revised the EIR</u> to state:

"The Mitigation Measures defined by this EIR in many instances encompass the policies contained in the proposed General Plan Framework. This fulfills the legislative intent for general plans and the CEQA process stipulating that 'mitigation measures developed through the environmental review process can and should serve as the basis for policies and implementation measures: The inclusion of policies as environmental mitigation measures acknowledge the role that has been defined by the State specifying that a general plan's policies represent a 'clear commitment of the local legislative body for implementation: For these reasons; the policies defined as mitigation measures are assumed by the DEIR to be fully implemented. In the event that budget limitations or other factors prevent their full implementation, the failure to effectuate the policy and corresponding implementation program(s) may represent a significant impact. The proposed project establishes a potential mechanism for '... regulating the type, location, and/or timing of development, when ... additional infrastructure and services have been provided, and there remains inadequate public infrastructure or service to support land use development (Policy 3.3.2[ d]).' to respond to such impacts."

#### The Infrastructure Mitigation – How is it to be used/How is it supposed to work?

The Infrastructure Mitigation is to be used as <u>the</u> mitigation/check and balance on development and the infrastructure.

Numerous community plans <u>spell out</u> the very precise way the Infrastructure Mitigation is supposed to function.

A determination is made if any infrastructure element is <u>threatened</u> through the Annual Report on Growth and Infrastructure.

Pursuant to Public Resources Code §21081.6, the general plan must incorporate the approved mitigation measures identified in the EIR into its policies and plan proposals.

If it is, the City has a choice: Confirm that the resources exist to eliminate the threat within 12 months <u>or</u> put building controls in place. It's that simple. The actual language <u>from the City</u> is:

"...if this monitoring finds that population in the Plan area is occurring faster than projected; and, that infrastructure resource capacities are threatened, particularly critical ones such as water and sewerage; and, that there is not a clear commitment to at least begin the necessary improvements within twelve months; then building controls should be put into effect, for all or portions of the West Los Angeles Community, until land use designations for the Community Plan and corresponding zoning are revised to limit development."



One of the best ways to explain how the Infrastructure Report is supposed to function is by way of an example.

Assume you are driving in a car. Are you breaking the speed limit? You can't know as your speed and the limit are not known.

Now you are told you are going 55 mph. Are you breaking the speed limit? You can't be sure. Though you are monitoring your speed, you do not know the limit.

Now you are told the limit is 35 MPH. Are you breaking the speed limit? Yes. Your monitoring is providing you with your current speed. The speed limit provides a trigger level which result in a conclusion that you are breaking the speed limit.

Does this knowledge constitute mitigation of the violation? No. Only tapping the brake and/or easing off of the accelerator will bring you into compliance with the limit.

Now assume you are going 35 MPH. Are you at <u>risk</u> of violating the speed limit? You can't know as there is no trend line data to inform you.

Now you are told you happen to be going down a hill and your previous speeds over the last minute were 20, then 25, then 35. The trend line and knowledge of the context of your situation would indicate that you are at risk of exceeding the limit and that action is necessary to mitigate the risk/threat. This is the precise mechanism the City approved as its mitigation.

This is what the Infrastructure Mitigation is supposed to do for the City. If development is outpacing the infrastructure, then the City is supposed to hit the brakes. Unfortunately, in the absence of the Infrastructure Report, the City doesn't know how fast its going, doesn't know the speed limit, has no context or trend line and doesn't even own a brake pedal.

#### Reliance on the Infrastructure Report /Interdependency of General Plan Elements

How important is the Infrastructure Report to the planning process? The best answer is to see how many other planning policies and key documents rely on the Infrastructure Report for its mitigating effect. The Infrastructure Report is <u>specifically cited</u> by virtually every element in the General Plan, including the Fire/EMS section and even the newly adopted Housing Element.

The Housing Element, updated in 2008, depends heavily on the Infrastructure Report. It states:

The Mitigation Monitoring Program was adopted by the City Council on December 11, 1996, in conjunction with the adoption of the Los Angeles General Plan Framework Element, its accompanying Final Environmental Impact Report (FEIR No.199407 1030) and Statement of Overriding Considerations. The Mitigation Monitoring Program is required by Section 21081.6 of the California Public Resources Code.

Pursuant to Government Code Section 65103(c), local officials must implement the adopted plan and the policies and programs it contains. The Mitigation Monitoring Plan consists of two annual reports to the City Council.

COMPONENT 1. The first component is the Annual Report on Growth and Infrastructure which presents the amount and distribution of actual growth of population and residential, commercial, and industrial land uses; growth in households; growth in jobs to the extent that this information is available; the actual capital investment funds allocated to infrastructure projects; and other factors directly related to growth. This allows the City to compare actual growth in the City with projections and to identify trends and the need for updated projections and/or estimates for population, land use, jobs, and housing units.

**The Transportation Element** clearly cites the Infrastructure Report as the means by which it will communicate progress. It states that the Transportation Element evaluation report will be prepared by the City Planning Department every two years for inclusion in the Framework Annual Report on Growth and Infrastructure.

**The Land Use Element/Community Plans** rely heavily on the Infrastructure Report to provide the essential triggering mechanism for when building controls should be put into place. Multiple community plans have this language:

"...if this monitoring finds that population in the Plan area is occurring faster than projected; and, that infrastructure resource capacities are threatened, particularly critical ones such as water and sewerage; and, that there is not a clear commitment to at least begin the necessary improvements within twelve months; then building controls should be put into effect, for all or portions of the West Los Angeles Community, until land use designations for the Community Plan and corresponding zoning are revised to limit development."

The City even cited the Infrastructure Report in seeking federal money<sup>5</sup> (\$168M through the CDD this year)

City of Los Angeles, Consolidated Annual Performance and Evaluation Report, Program 2003-2004

#### SECTION VIII OTHER ACTIONS continued

#### ENSURING COMPLIANCE WITH PROGRAM AND COMPREHENSIVE PLANNING REQUIREMENTS

A system for the annual monitoring of growth, infrastructure, and services, used as the basis to guide future capital investments and development decisions, will also be used as a mechanism to gauge the appropriateness of the estimates and provide for their modification over time.

- Prepare and submit to the City Council an Annual Report on Growth and Infrastructure, based on information compiled by the monitoring program;
- Establish procedures for City agencies to coordinate the provision of services and infrastructure to support growth;

Accurate monitoring and reporting also played a large part in the City's ability to avoid legal action by the U.S. EPA. In its case for preparing the new General Plan, the City stated: *"Furthering the need to prepare a new plan is the mandate of the United States Environmental Protection Agency (EPA) which requires the City of Los Angeles to update its General Plan to make it consistent with the Regional Air Quality Management Plan."* 

It is critical to note that the City's <u>current</u> argument that the Infrastructure Report is not required is not only inconsistent with past arguments, but would place the entire General Plan in a state of inconsistency as other General Plan elements rely on the Infrastructure Report to inform the Infrastructure Mitigation process. General Plan elements that rely on the Infrastructure Mitigation for as their mitigation would impermissibly be relying on a contingent mitigation lacking a "clear commitment" on the part of the City to implement the mitigation.

<sup>&</sup>lt;sup>5</sup> http://cdd.laCity.org/pdfs/caper/VIII\_ensure.pdf
An inconsistent General Plan is contrary to State law. In fact, the City stated requirements for consistency in its General Plan. It says:

"According to State Government Code (Sec. 65300.5), all elements of the general plan must be consistent with each other. This internal consistency requirement has several important implications for the structure and content of the General Plan. First, it establishes that all elements of the General Plan have equal legal status."

# Goal of the suit

The goal of Fix The City's lawsuits: We are seeking no more or less than promised and required by law.

The City cannot be fixed if developer-driven planning is allowed to deplete City infrastructure and services. Further, in the absence of a clear and objective means to measure Citywide cumulative environmental impacts of projects, each developer is free to establish their own self-serving impact thresholds.

In one of the most forthright evaluations of how the City of Los Angeles really works, from Playa Vista to Staples to the La Brea Gateway and beyond, Los Angeles County Supervisor Yaroslavsky made the following observations:

"Planning is not being done by the City but by the developer interests." and "The development community believes they can get anything they want."

It wasn't supposed to be this way. This is not what the City promised during its General Plan revision process, nor is it what the City is legally committed to do with regard to the Infrastructure Mitigation. Development Approvals should be based on the City's ability to provide the necessary infrastructure and services to its citizens, not on developer's ability to get what they want.

Fix The City Goal - Implement the Infrastructure Mitigation by:

- Establishing minimum service thresholds for each infrastructure element;
- Establishing objective criteria for when an infrastructure element is threatened. For example, the City would need to take into account the time it takes to train new firefighters or police officers to make sure they have enough when they need them;
- Performing uniform and regular monitoring;
- Consolidating the data to establish current levels of infrastructure capacity;
- Comparing actual findings to trigger levels and threat criteria;
- Making a finding that it can or cannot make a clear commitment to begin necessary improvements to eliminate the threat to the infrastructure;
- Preparing an Annual Report on Growth and Infrastructure that includes the above; and then
- Implementing building controls if the infrastructure is threatened AND the City does not have the resources to eliminate the threat.

# Importance to the Community

The importance of Fix The City lawsuit cannot be overstated. If the City is forced to implement the promised and required mitigation the community will have an objective process for deciding when, where and if development should occur. The community will also be able to cite the Infrastructure Report(s) should the City attempt to put in place density-increasing or infrastructure-depleting ordinances or policies. Most importantly, it will provide consistency and certainty for all involved by creating an objective set of criteria for development <u>tied to</u> actual infrastructure capacity.

Fix The City is represented by Doug Carstens of Chatten-Brown & Carstens. Information requests should be sent to Info@FixTheCity.Org. For updates on the Fix The City, go to www.InfrastructureCoaltion.Org.

The authors wish to thank Lucille Saunders and Sabrina Venskus for their input. Infrastructure Coalition™ FixTheCity

# **Exhibits/References**

#### Letter from then Assemblyman Antonio Villaraigosa....

STATE CARTOL P.O. BOX SHORM RACRAMENTO, CA SHOH-ODH PHONE: INTEL 45-0705 DISTRICT OFFICE INTENDETH AVERALE SE UCE AVER, BS, CA 10042 (UCE AVER, BS, CA 10042

Assembly California Legislature antonio villaraigosa



April 25, 1995

BD

Ann Siracusa Principal Planner Cityvide Planning Division Department of City Planning 221 South Figueros St., Rm 410 Los Angeles, CA 90012

Dear Ms. Siracusa:

RE: CFC 94-0354; Draft General Plan Framework Element

I'm writing to offer my comments on the Draft General Plan Framework Element currently in circulation.

Overall, I am impressed with the level of detail and specificity written into this document. However, I question whether the Framework realistically deals with the major land use issues facing our city. I also question whether it reflects the nature of the public input gathered at community meetings and cherrettes in 1992 and 1993. My observations tell me it does not.

This latter point is important because a root cause of the "disconnect" that exists between the government, the development community and the general public is the public's feeling that it does not have a maningful role in the process. This leads to a politicization of the planning and permitting process. This leads to at the kind of erratic, project-based planning that aggravates everybody involved. Projects are invariably fought out through a saries of hearings, with a few then going to court. The bold effort the City is making to reduce the number of hearings will only serve to enflame the situation if the public is not confortable with the land use plans and regulations upon which projects are based.

There clearly has been a change of land use philosophy in City Hall since the Framework process began, and it shows in the draft plan. I do not believe the this document includes much of the public input you gathered. Rather, the Economic Development element has become the driving force of the plan. The political and environmental aftermath from the city's economic development oriented land use experiences in the '70s and '80s should remind us

Alexan in Reviews Alexa

of the need to be cautious regarding such an approach.

I have some basic concerns:

 Mobility and Sconomic Development: As a former Metropolitan Transportation Authority boardmenher. I am acutely aware of the relationship between land use patterns and mobility. As a city, we seem to be incapable of seriously addressing our mobility problems, despite the thetoric and the dollars spent. Our highly developed neighborhoods are very congetted and even the substantial investment we are making in rail transit will not change that.

The Framework's effort to create "Community Canters" throughout the city opens the door to more congestion. This is especially true if these Centers are not fine-tuned so as to ensure that a full mix of housing is included in any future development which takes advantage of the allowable height and density.

There is language in the Economic Development section encouraging the development of revenue generating uses and a drive toward simplifying the permit process. This suggests a real possibility of further over-concentrations of commarcial development. This will have negative mobility and environmental consequences. At the same time, it does not guarantee any kind of systematic, sustainable economic benefit. Instead, if's sinply back to "business-as-usual." That didn't lead to workable development and I doubt it will do so in the future.

2. Housing Affordability and Density: With regard to the housing section. I an relieved to see an acknowledgement of the need for appropriate, affordable housing for the city's changing population. However, I find the affordable housing incentives offered to be vague. I understand that the General fian Housing Element, the Comprehensive Housing Affordability Strategy and the community plans are the nost likely repositories for the specifics.

I urge the Department to develop aggrassive strategies to generate affordable units in a variety of contexts in every neighborhood. This should include incentives requiring affordable units in both mixed-use commarcial and residential projects receiving density bonuess. For example, I do not believe projects in Community Centers should be permitted to be more than four stories high unless they feature a substantial affordable component.

3. Community Center Beights: As noted above, I am concerned about the height allowances in the Community Center designation. I believe this proposal will, in general, permit out-of-scale development in many of the neighborhoods in which it is proposed to be applied. In the 45th Assessmbly District, which I represent, the two Community Center designations along North Figueroa in Highland Park are problematic. They also threaten a number of historic buildings by providing a major economic incentive for random redevelopment on a lot-by-lot basis.

Department staff has informed me that the provisions of the draft Northeast Community Plan, if ultimately adopted, will prevail over Framework recommandations. That is reassuring because I believe that Plan more closely reflects the desires of the people who live and work in the community. This relationship should be replicated with regard to all community and district plans as they relate to the Framework. BD-5

4. Floor-Area Ratio: I note that the Framework calls for noteworthy increases in allowable floor-area ratio (FAR) in many locations. This is in direct conflict with Proposition U, resoundingly approved by the voters a few years ago. The erosion of Proposition U's 1.5:1 FAR for most commercial properties is perhaps the Framework's most objectionable provision.

Reep in mind that the average built PAR in fos Angeles is very low, possibly below .5:1. The ides that we can accommodate even the tripling of density already permitted by 1.5:1 FAR is far-fetched. For the Framework to go even further is quite unrealistic and bad public policy.

I plan to continue monitoring the progress of the Framework as it continues through the City's approval process and look forward to further opportunities to comment on its contents.

Very Truly Yours) ANTONIO R. VILLARAIGOSA Assemblymember, 45th District

ARV/jb

cc: Hon. Hal Bernson Hon. Richard Alatorre Hon. John Ferraro Hon. Jackie Goldberg Hon. Mike Bernandez

# General Plan – Executive Summary – Page 2 (000008)

At the same time, the population and employment estimates do not represent maximum or minimum levels of growth to be permitted. A system for the annual monitoring of growth, infrastructure, and services, used as the basis to guide future capital investments and development decisions, will also be used as a mechanism to gauge the appropriateness of the estimates and provide for their modification over time.

# General Plan – Executive Summary – Page 7 (000013)

For each of the public services and infrastructure systems, four basic policies are defined by the Framework Element: Monitor levels of demand and the abilities of the service/infrastructure system to support demands. Use these demands to forecast future needs and improvements.

# General Plan – Executive Summary – Page 7 (000013)

# Implementation Programs

A diversity of programs are specified to implement the General Plan Framework Element's policies. Their timing is contingent on the availability of adequate funding. Key programs include the following: Establish a program to monitor growth and public service and infrastructure demands and capacities. Prepare and submit to the City Council an Annual Report on Growth and Infrastructure, based on information compiled by the monitoring program. • Amend the community plans and the zoning ordinance (Municipal Code), guided by the Framework Element's policies and standards. • Formulate master and financing plans for public services and infrastructure that are correlated with forecast population and employment growth.

# General Plan – Page 1-2 (000017)

*Implementation* is made more effective through citywide monitoring of growth trends and infrastructure capacity. Public participation will ensure the responsiveness and relevance of the community plans that, over time, will be updated as a strategy for implementing the Framework Element. An annual report to the City will provide an opportunity to make policy adjustments as necessary in light of changing circumstances.

# General Plan - Page 1-3 (000018)

Changes to the law over the past twenty years have vastly boosted the importance of the general plan to land use decision-making. A general plan may not be a "wish list" or a vague view of the future but rather must provide a concrete direction. In essence, the general plan is a "constitution for development," the foundation upon which all land use decisions in a city or county are to be based. It expresses community development goals and embodies public policy relative to the distribution of future land use, both public and private.

# General Plan – Page 1-6 (000021)

The Framework Element sets forth a conceptual relationship between land use and transportation on a citywide basis and defines new land use categories which better describe the character and function of the City as it has evolved over time. In addition, it sets forth an estimate of population and employment growth for a 15 to 20 year time period that can be used to guide the planning of infrastructure and public services. This, however, does not represent a limit on growth or a mandated level of growth in the City or its community plan areas. Traditionally, such "end-state" limits have proven ineffective in guiding growth and public infrastructure and service investments and in responding to the changing needs of a city's residents and its economy. In its place, the Framework Element establishes a program to annually monitor growth, its impacts, and infrastructure and service needs that will be documented in a report to the City Council and pertinent service departments and agencies. This will provide decision makers and planners with the information that is essential in shaping growth in a manner that can mitigate its impacts, minimize development costs, conserve natural resources, and enhance the quality of life in the City.

# General Plan – Page 1-6 (000021)

# MONITORING AND REPORTING

The Department of City Planning will develop and implement a growth Monitoring System and annually prepare a Report on Growth and Infrastructure to the Mayor, City Council, and the City Planning Commission. The Annual Report on Growth and Infrastructure will include policy and program recommendations and summary information generated by the Monitoring System on the City's changing circumstances, needs, and trends.

# General Plan – Page 1-7 (000022)

# INTERNAL GENERAL PLAN

According to California State Government Code Section 65300.5, a general plan must be and internally consistent, both among the elements and within each element. Elements adopted by the City as well as the mandatory elements. The internal consistency requirement also applies to the community plans which collectively comprise the City's Land Use Element. All principles, goals, objectives, policies, and plan proposals set forth in the general plan must be internally consistent. All adopted elements have equal status and no element may be made subordinate to another.

# General Plan – Page 1-9 (000024)

# 8. Annual Review

The Department of City Planning shall annually review the need to comprehensively update the citywide elements, including the Framework Element and the community plans. The results of this annual review shall be reported to the City Planning Commission, the City Council, and the Mayor through the Annual Report on Growth and Infrastructure. This report shall recommend which citywide element or community plan should be updated and why. These recommendations shall be based on an evaluation of changing circumstances, and other information provided by the Monitoring System.

# General Plan – Page 1-9 (000024)

9. General Plan Preparation, Revision, and Update Program

The Department of City Planning has established a program to comprehensively update general plan elements and community plans to implement the goals, policies, and objectives established in the Citywide General Plan of funding, all comprehensive updates of the citywide elements and the community plans for the purpose of implementing the Framework Element shall be initiated within five years of adoption of the Framework Element. Phasing of such updates may be made in accordance with Objective 3.3. and Policies 3.3.1 and 3.3.2 based on the monitoring of population, development, and infrastructure and service capacities as recommended through the Annual Report on Growth and Infrastructure.

# General Plan – Page 2-1 (000026)

The estimates are not intended to represent maximum or minimum levels of development to be permitted. Rather, they will be monitored annually as a basis for the implementation of infrastructure and services to support growth. Based on the monitoring, the "horizon" may be adjusted to reflect the actual levels of growth and their impacts and demands on infrastructure and public services. At a minimum, the "horizon" must be reviewed and updated as the population and employment forecasts and/or 2010 are approached.

# General Plan – Page 2-3 (000028)

# **GROWTH MONITORING**

After the Framework Element is adopted, the City will establish a growth monitoring program that will provide important information regarding the accuracy of future growth estimates and the distribution of that new development by community plan area. This monitoring program will annually document what has actually happened to the City's population levels, housing construction, employment levels, and the availability of public infrastructure and public services. Information on environmental conditions will also be monitored on a yearly basis to maintain and update an environmental database, which will be used to facilitate but not replace, environmental review for subsequent programs and projects in accordance with CEQA.

# General Plan - Page 2-3 (000028)

The information from such a monitoring system will be presented to the City Council in the form of an Annual Report on Growth and infrastructure, which can be used as the basis for revision of policies as needed to meet the goals of the Framework Element. The status of environmental mitigation requirements can also be determined and policies can be changed if desired results are not being obtained. Information on amounts and location of growth can be provided and policies influencing this growth can be revised if needed. In this fashion, the Framework Element can be continually updated to meet changing conditions, and the implementation mechanisms revised or altered to achieve the desired goals. SCAG will require monitoring in all its subregions in a similar manner.

# General Plan - Page 2-3 (000028)

Should population and employment growth be greater than the levels anticipated by the Framework Element, policy stipulates that studies be undertaken to correlate with the necessary supporting capital, facility, or service improvements and/or demand reduction programs. At the same time, the impacts of the additional level of growth must be found to be consistent with the findings of the Environmental Impact Report regarding their level of significance. Should additional potential impacts be identified, these would be subject to further environmental review in accordance with the CEQA. This would be facilitated by the implementation of a program to monitor the characteristics and impacts of growth and availability of infrastructure and public services (the "Monitoring Program") and annual reporting of this information to the City Council (the "Annual Report on Growth and Infrastructure") as a basis for the planning and funding of necessary improvements.

# General Plan – Page 3-1 (000032)

To facilitate growth in those areas in which it is desired, the Land Use Policies provide for the (1) establishment of a process to expedite the review and approval of development applications that are consistent with the Framework Element and community plans, (2) the implementation of infrastructure and public service investment strategies, and (3) a program to monitor growth and infrastructure and public service capacity and report their status annually to the City Council.

- 3.3.2 Monitor population, development, and infrastructure and service capacities within the City and each community plan area, or other pertinent service area. The results of this monitoring effort will be annually reported to the City Council and shall be used in part as a basis to:
  - a. Determine the need and establish programs for infrastructure and public service investments to accommodate development in areas in which economic development is desired and for which growth is focused by the General Plan Framework Element.
  - b. Change or increase the development forecast within the City and/or community plan area as specified in Table 2-2 (see Chapter 2: Growth and Capacity) when it can be demonstrated that (1) transportation improvements have been implemented or funded that increase capacity and maintain the level of service, (2) demand management or behavioral changes have reduced traffic volumes and maintained or improved levels of service, and (3) the community character will not be significantly impacted by such increases.

Such modifications shall be considered as amendments to Table 2-2 and depicted on the community plans.

- c. Initiate a study to consider whether additional growth should be accommodated, when 75 percent of the forecast of any one or more category listed in Table 2-2 (see Chapter 2: Growth and Capacity) is attained within a community plan area. If a study is necessary, determine the level of growth that should be accommodated and correlate that level with the capital, facility, or service improvements and/or transportation demand reduction programs that are necessary to accommodate that level.
- d. Consider regulating the type, location, and/or timing of development, when all of the preceding steps have been completed, additional infrastructure and services have been provided, and there remains inadequate public infrastructure or service to support land use development.

(P42, P43)

#### General Plan – Page 9-6 (000129)

2. How will the City identify where, when, and how many improvements are needed for infrastructure and public service systems? Los Angeles needs consistent information concerning its infrastructure and public service systems, for effective capital investing. The City therefore needs to maintain up-to-date inventories of all its systems; computer models capable of evaluating the impacts of proposed projects on City-owned infrastructure; regular forecasts of each infrastructure system's needs, which can be used to guide capital improvement decisions; trigger mechanisms that can warn decision makers when and where future needs will occur; and reporting systems that enable the City to update its models. All of this information should be compiled in a Annual Report on Growth and Infrastructure, which will provide City staff, the City Council, and service providers with information that can facilitate the programming and funding of improvements or making decisions when to take other actions.

#### General Plan – Page 10-1 (000146)

While in excess of 60 programs are described, the following summarizes the principal programs that are essential in carrying out the policy direction of the Framework Element:

A program to monitor the status of development activity, capabilities of infrastructure and public services to provide adequate levels of service, and environmental impacts (e.g., air emissions), identifying critical constraints, deficiencies and planned improvements (where appropriate) (P42). • An Annual Report on Growth and Infrastructure that documents the results of the annual monitoring program (P43).

# General Plan – Page 10-18 (000163)

P42 Establish a Monitoring Program to accomplish the following:

a. Assess the status of development activity and supporting infrastructure and public services within the City of Los Angeles. The data that are compiled can function as indicators of (a) the rate of population growth, development activity, and other factors that result in demands for transportation, infrastructure, and services; (b) location and type of infrastructure investments and improvements; and (c) changes to the citywide environmental conditions and impacts documented in the Framework Element environmental database and the Environmental Impact Report.

b. Assess transportation conditions and determine the City's progress toward attainment of citywide transportation objectives.

c. Determine the progress of the Los Angeles County Sanitation District 2010 Master Facilities Program and any other capital improvement projects which could affect their ability to collect City wastewater and provide full secondary treatment for that wastewater.

d. Identify existing or potential constraints or deficiencies of other infrastructure in meeting existing and projected demand.

e. Identify, based on consultation with the LAUSD, the surplus and/or deficit of classroom seats.

Responsibility: Department of City Planning, LADWP, Public Works, Fire and Police Funding Source: General Fund, Power Revenue Fund, development fees, Sewer Constructionl Maintenance (SCM), Federal funds and other funding sources Schedule: Within one year of Framework Element adoption

P43 Prepare an Annual Report on Growth and Infrastructure based on the results of the Monitoring Program, which will be published at the end of each fiscal year and shall include information such as population estimates and an inventory of new development. This report is intended to provide City staff, the City Council, and service providers with information that can facilitate the programming and funding of capital improvements and services. Additionally, this report will inform the general plan amendment process. Information shall be documented by relevant geographic boundaries, such as service areas, Community Plan Areas, or City Council Districts.

Responsibility: Department of City Planning in consultation with City departments Funding Source: General Fund and other appropriate sources Schedule: At the end of the fiscal year

# Major Projects Sketch Plan – DCP, January 1993 (000180)

# Product - Growth Monitoring

The recommended system will work to the extent that a monitoring program is developed that provides comprehensive and reliable information on where growth is occurring and where infrastructure capacity exists so that action can be taken in the form of a phased program of public investments. Changes in the physical condition of the City must be recorded and tracked. The objective here is to create a procedure that enables the City of Los Angeles to link its General Plan policies with the process used to make decisions concerning the location and type of capital improvements.

#### **Opposition brief of COLA Case#BS042964 (000194)**

3	The Notice of Completion, the GPF and DEIR described seven programs to implement the GPF		
4	subsequent to its adoption: a Monitoring Program, an Annual Report on Growth and Infrastructure, a		
5	Capital Improvement Program, a Transportation Improvement and Mitigation Program (TIMP), a		
6	Community Plan Update Program, Planning and Zoning Code Amendments, and a program of new		
7	and amended Plan Elements. (Pub.Res.Code Section 21081.6 also requires monitoring program, which		
8	was adopted at the time of GPF approval. (I AR 26).		

# Opposition brief of COLA Case#BS042964 (000199)

21 A crucial part of the GPF is its on-going monitoring program to update the data and assumptions

22 underlying the policies and programs in the GPF. (2 AR 284-285). It is a "program to monitor the status

23 of development activity, capabilities of infrastructure and public services to provide adequate levels of

24 service, and environmental impacts (e.g., air emissions), identifying critical constraints and deficiencies

25 and planned improvements (where appropriate) (P42)\* (2 AR 285 [summary]; 2 AR 303-304 [GPF

26 (required contents of program]). This monitoring calls for an Annual Report on Growth and

27 Infrastructure (2 AR 285) which will be used to modify GPF and EIR assumptions and serve as the basis

28 for evaluating the effectiveness of the GPF objectives, policies, programs, and mitigation measures. (2

#### **Opposition brief of COLA Case#BS042964 (000206)**

2 Fifth, even if all parts of the TIMP implementing program were dependent upon funding, and

3 even if funding was the sole determinate of feasibility, the GPF and DEIR called for many

4 implementing programs and mitigation measures other than those in the TIMP. A crucial aspect of the

5 entire GPF was (1) its monitoring program which provides the methods by which substantive decisions

6 on how and when to adjust densities based on updated information and progress reports reporting past

7 performance and current status, and (2) its intent to modify the location and arrangement of different

8 land uses to effectuate its various policies.

#### **Opposition brief of COLA Case#BS042964 (000210)**

21	Finally, petitioners attack as "infe	ssible by definition* (POB 12:1) the fifth alternative - the long
22	range build out of the GPF use categories	without the triggering mechanisms to tie infrastructure to

23 new development. (If this was "infeasible by definition", then the inclusion of this definition in the

24 DEIR which was circulated for four months in early 1995 should have triggered some sort of written

25 objection during the public comment period from petitioners or others, for that matter.) This

26 alternative was particularly helpful because it informed the City that a triggering mechanism should be

27 included in the GPF so that allowable increases in density through community plan amendments would

28 not occur until infrastructure and its funding was available.

What became clear was that a crucial feature of dealing with growth impacts was contained in the GPFits program for timing allowable development with available infrastructure and frequent updating of its data along with a formal monitoring program. For this reason, the City concluded that the GPF was the environmentally desirable alternative, because it had the best combination of land use policies tied to mitigation measures tied to annual reporting and selective amendments of community plans only when consistent with the GPF policies. (1 AR 77-78 [findings adopted by City Council explaining why GPF was environmentally superior alternative]).

General Plan Monitoring and Mitigation Program (000245)

#### THE GENERAL PLAN FRAMEWORK ELEMENT MITIGATION MONITORING PROGRAM

#### May 7, 1996

In compliance with Section 2181.6 of the California Public Resources Code, public agencies approving projects which have the potential to cause significant environmental impact must adopt a Reporting and Monitoring Program or require changes to the proposed project which mitigate or avoid the significant impacts. While the General Plan Framework Element the City's General Plan incorporates policies and programs to mitigate most environmental impacts, Environmental Impact Report # 94071030 identifies some cases in which proposed policies and programs does not sufficiently mitigate significant environmental impacts, should the city's population continue to increase as forecast. In those cases, additional mitigation measures were recommended and those adopted are included in this action. Pursuant to Government Code Section 65103(c), local officials must implement the adopted plan and the policies and programs it contains. The Mitigation Monitoring Plan consists of two annual reports to the City Council.

<u>COMPONENT 1.</u> The first component is the Annual Report on Growth and Infrastructure which presents the amount and distribution of actual growth of population and residential, commercial, and industrial land uses; growth in households; growth in jobs to the extent that this information is available; the actual capital investment funds allocated to infrastructure projects; and other factors directly related to growth. This allows the City to compare actual growth in the City with projections and to identify trends and the need for updated projections and/or estimates for population, land use, jobs, and housing units.

<u>COMPONENT 2.</u> The second component is an Annual Report on Status of the General Plan Implementation Programs. This report will be compiled by monitoring and evaluating the status of each implementation program and additional mitigation measure, and comparing this information with component one. If appropriate, the status report will recommend any modifications that appear necessary to adjust the Framework Element (or any of the programs) in order to achieve the results desired.

#### General Plan EIR Page 1-2 (000262)

Based on these considerations, it is the intent of the General Plan Framework to: Establish a short-term estimate of population growth that can rationally be used for the planning and funding of infrastructure and services; to support growth and encourage patterns of development which reduce potential environmental impacts such as traffic congestion and air emissions; and to improve the quality of life for the City's residents. Recognizing that the demands and impacts of growth may vary due to changing characteristics of the population and technologies, it is the intent of the Framework to set in place a system to monitor and annually report growth demands and impacts as the basis for the implementation of strategies for their accommodation.

#### General Plan EIR Page 1-3 (000262)

The Department of City Planning will develop and implement a growth Monitoring System and annually prepare a Report on Growth and Infrastructure to the Mayor, City Council, and City Planning Commission. The Annual Report will be generated by the Monitoring System regarding the characteristics, impacts, and needs of growth.

#### General Plan EIR Page 1-7 (000266)

1.0 PROJECT DESCRIPTION

3. A comprehensive planning and implementation program, including:

- a. Planning Processes and Reporting
  - (1) Monitoring Program

Assessment of the status of development activity within and outside of the Framework's targeted growth areas. Data will function as an indicator of the (1) rate of population growth, development activity, and other factors affecting infrastructure demands, (2) location and type of new infrastructure investments, and (3) changes to the citywide environmental data base and CEQA-related cumulative impact information.

(2) Annual Report on Growth and Infrastructure

This report will document (1) the amount of growth during the previous year, (2) its effects on the capacities of Los Angeles' public infrastructure and services, as measured by the Monitoring Program, and (3) estimates of thure near-term population growth. It is the intent of the Report to provide City staff, the City Council, and service providers with information that can facilitate the programming and funding of improvements and/or serve as the basis for the management of growth when deficiencies occur.

(3) Citywide Environmental Data Base

Information regarding the status of environmental resources, infrastructure, and services, as documented in the Framework Technical Background Report (Volumes II, IIIA, and IIIB) and impacts defined by the Environmental Impact Report.

(4) Capital Improvement Program

Continued implementation of a five year CIP that is updated annually. It would use information derived from the Monitoring Program to aid in the determination of projects that should be included; including consideration of the prioritization of improvements in areas in which growth is targeted by the Framework.

# General Plan FEIR/Proposed Statement of Overriding Considerations Page 5 (000273)

The Framework Element includes an on-going monitoring program to update the demographic forecasts that underpin the plan and its Environmental Impact Report (EIR). The monitoring system will result in the issuance of an Annual Report on Growth and Infrastructure which will be used to modify plan and EIR assumptions and serve as the basis for evaluating the effectiveness of the Framework Element's objectives, policies, programs, and mitigation measures.

# General Plan FEIR/Proposed Statement of Overriding Considerations Page 19 (000287)

- J. POLICE
- 1. Impacts

The amount of population, employment, and housing growth that the Framework Element permits by policy could result in a significant increase in the demand for police protective services as compared to existing baseline levels (1990). Based on the planning ratio standard used to determine the adequacy of the supply of sworn officers, a total of 17,673 officers would be needed to adequately accommodate the City's 2010 average day/night population. This is in comparison to the 8,817 sworn officers that were on the force as of 1990.

These impacts are potentially significant.

# 2. Mitigation Measures

The Framework Element's economic development policy targets an employment base that exceeds SCAG's jobs forecast to maintain the City's 1990 jobs/housing ratio through the year 2010. This increased economic base will provide additional revenue necessary to pay for added police protective services. Additionally, the Framework Element includes a policy that requires the City to correlate the type, amount, and location of development with the provision of adequate supporting infrastructure and public services.

# General Plan FEIR/Proposed Statement of Overriding Considerations Page 38 (000306)

Proposed Revised Findings and Statement of Overriding Considerations

The Theoretical Buildout Alternative assumes buildout of the Framework Element without land use and managed development policies liaking growth with infrastructure capacity. Under this alternative, there would be no trigger mechanisms available to generate additional review when infrastructure improvements are not able to keep up with the demands placed on them by new development.

# General Plan FEIR/Proposed Statement of Overriding Considerations Page 38 (000307)

4. None of the alternatives fulfill the central objectives of the Framework Element. The No Project and Theoretical Buildout Alternatives permit development to exceed adequate infrastructure levels, contributing to reduced air quality and transportation impacts, in an automobile-oriented land use and urban form pattern that disperses development, thus endangering the character of low-density residential neighborhoods. These alternatives further lack policies that encourage quality development, walking, and transit use. The No Growth Alternative perpetuates a negative existing automobile-oriented pattern of land use and urban form, while reducing employment opportunities needed to revitalize economically disinvested neighborhoods and the revenue needed to provide adequate infrastructure. The 2010 Market Alternative also perpetuates a negative existing automobile-oriented pattern of land use and urban form, and provides inadequate employment opportunities given the level of projected population and housing.

#### General Plan FEIR/Proposed Statement of Overriding Considerations Page 41 (000309)

K. The Framework Element promotes the goal of adequate infrastructure systems and public services through a policy that seeks to correlate the type, amount, and location of development with the provision of adequate supporting infrastructure and public services.

#### San Pedro Community Plan Language Page 11-5 (000314)

PLAN MONITORING The Plan has a land use capacity greater than the projected development likely to occur during the Plan period. During the life of the plan, growth will be monitored and reported in the City's Annual Report on Growth and Infrastructure which will be submitted to the City Planning Commission, Mayor, and City Council. In the fifth year following Plan adoption (and every five years thereafter), the Director shall report to the Commission on the relationship between population, employment, and housing growth and plan capacities. If growth has occurred faster than projected, a revised environmental analysis will be prepared and appropriate changes recommended to the Community Plan and zoning. These Plan and zoning changes shall be submitted to the Planning Commission, Mayor, and City Council as specified in the Los Angeles Municipal Code (L.A.M.C.). November, 1996

TO MEMBERS OF THE CITY PLANNING COMMISSION, THE CITY COUNCIL & THE MAYOR:

Better public information leads to better public policies and decisions. This simple premise explains our intent in producing this first Annual Report on Growth and Infrastructure and in submitting it to you.

This report provides a snapshot of the City of Los Angeles in terms of demographic, economic, land use, infrastructure, public facilities and capital program data. This objective information has already been available from a wide variety of sources. The contribution of this document is to make that information comprehensive and comprehensible - comprehensive by assembling a wide range of pertinent data, and comprehensible by graphically portraying the data on a series of maps.

# 1996 Annual Report on Growth and Infrastructure (000338)

Background This and future reports will become part of a growth monitoring system being developed by the Department of City Planning. This effort is undertaken in compliance with the California Environmental Quality Act (CEQA) mitigation monitoring requirements. It is also a major component of the City's new General Plan Framework Element.

The Framework Element (Chapters 2 & 10) commits the Department of City Planning to develop a monitoring system and prepare an annual report on growth and infrastructure for public officials:

A system for the annual monitoring of growth and infrastructure and services, used as the basis to guide future capital investments and development decisions, will also be used as a mechanism to gauge the appropriateness of the estimates (related to growth levels) and provide for their modification over time.... The Annual Report on Growth and Infrastructure will include policy and program recommendations and summary information generated by the Monitoring System on the City's changing circumstances, needs and trends

# **Executive Summary**

This is the second edition of the Annual Report on Growth and Infrastructure prepared by the Los Angeles City Planning Department. Based on data for the years 1994-96, the report presents an updated profile of the City's land use and socio-economic characteristics as well as information on public services and infrastructure. The preparation of this report fulfills a requirement of the General Plan Framework Element to monitor growth in population, employment and land use and to report on the adequacy of supporting public services and infrastructure.

2000 Annual Report on Growth and Infrastructure (000610)

Executive Summary

This is the third edition of the Annual Report on Growth and Infrastructure prepared by the Los Angeles City Planning Department. Based on data for the years 1996-1998, the report presents an updated profile of information on public services and infrastructure. Specific information is also presented for each community in addition to the citywide data summaries. The preparation of this report fulfills a requirement of the General Plan Framework Element to monitor growth and to report on the adequacy of supporting public services and infrastructure.

#### **2008 Housing Element Adoption**

NOW, THEREFORE, BE IT RESOLVED, that the Housing Element (2006-2014) be adopted to replace the 1998-2005 Housing Element of the General Plan and that it be submitted to the California Department of Housing and Community Development for a determination of compliance with State law.

BE IT FURTHER RESOLVED, that the City Council:

1. Has considered the information in the Framework Element FEIR including comments received during the review period and responses to those comments;

2. Finds the Framework Element FEIR is adequate for the Housing Element (2006-2014);

3. Finds that none of the conditions described in CEQA Guidelines section 15162 to require a subsequent or supplement EIR to the Framework Element FEIR apply;

4. (a) Certifies that the Framework Element FEIR for the Housing Element (2006-2014) has been completed in compliance with CEQA; (b) Has reviewed and considered the information in the Framework Element FEIR for the Housing Element (2006-2014); and (c) Finds that the Framework Element FEIR for the Housing Element (2006-2014) reflects the City Council's independent judgment and analysis;

5. Finds that mitigation measures have been incorporated through the re-adoption of the Framework Element's Mitigation Monitoring and Reporting Program that avoid or substantially lessen the significant environmental effects identified in the Framework FEIR as specified in the Framework FEIR;

#### **2008 Housing Element Mitigation Findings**

The Mitigation Monitoring Program was adopted by the City Council on December 11, 1996, in conjunction with the adoption of the Los Angeles General Plan Framework Element, its accompanying Final Environmental Impact Report (FEIR No.199407 1030) and Statement of Overriding Considerations. The Mitigation Monitoring Program is required by Section 21081.6 of the California Public Resources Code.

Pursuant to Government Code Section 65103(c), local officials must implement the adopted plan and the policies and programs it contains. The Mitigation Monitoring Plan consists of two annual reports to the City Council.

COMPONENT 1. The first component is the Annual Report on Growth and Infrastructure which presents the amount and distribution of actual growth of population and residential, commercial, and industrial land uses; growth in households; growth in jobs to the extent that this information is available; the actual capital investment funds allocated to infrastructure projects; and other factors directly related to growth. This allows the City to compare actual growth in the City with projections and to identify trends and the need for updated projections and/or estimates for population, land use, jobs, and housing units.

# Letter from Con Howe dated May 25, 1995 & City Response (General Plan FEIR)

- More Details About Measures Now In Development. We are aware that several key implementation measures, such as a new mixed-use development ordinance and the annual monitoring plan, are now in preparation, but are not available for public review. It is important to us, for example, that the proposed annual monitoring plan track progress on the degree to which the Framework is successful in achieving impact mitigation, and not be limited to reporting annual changes in City population, housing, employment and infrastructure capacity. The details of such measures must be made available now so that the public and decision makers can assess the reasonableness and feasibility of these measures for helping to mitigate environmental impacts.
- BF-3 The City is in full agreement with the authors of this comment. That is why a substantial monitoring program is proposed. All facets of the Framework's mitigation plan will be monitored carefully. A detailed monitoring plan will be approved as part of the Final EIR. The monitoring program will be updated annually to respond to events as they occur.

Filed 9/28/00

#### CERTIFIED FOR PUBLICATION

#### IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA

#### SECOND APPELLATE DISTRICT

#### DIVISION THREE

#### FEDERATION OF HILLSIDE AND CANYON ASSOCIATIONS et al.,

B126659

Plaintiffs and Appellants,

v.

CITY OF LOS ANGELES et al.,

Defendants and Appellants.

(Los Angeles County Super. Ct. No. BS042964)

The GPF stated that the city would "accommodate [the] projected population and

employment growth" (Policy 3.3.1) and would monitor growth and its effects on

infrastructure and service capacities annually in order to "consider regulating"

development if the infrastructure remains inadequate (Policy 3.3.2(d)). It also stated that

the city would increase the GPF's growth projections if and when transportation

improvements and other effective mitigation measures are implemented. (Policy

#### March 2009 "Performance Audit of the City of Los Angeles' Process for Planning Conditions for Development

#### Conclusions

City departments do not consistently track, plan or budget for public improvements installed as a result of conditions of approval imposed by City Planning decision makers for development projects. Although project applicants pay the costs of installing public improvements, only some departments track and recover maintenance costs for these improvements. Other departments do not track these costs separately or recover ongoing costs. No departments systematically track requirements for new development projects imposed by City Planning decision makers as part of their fiscal planning process.

Some City departments do not collect sufficient fee revenues to cover the costs of maintaining public improvements imposed as conditions of approval for development projects. Specifically, the Urban Forestry Division of the Bureau of Street Services, the Bureau of Street Lighting, and in the Bureau of Sanitation maintenance fee revenues are not sufficient to recover the costs of maintaining public improvements.

#### SCAG Letter April 6, 1995 in General Plan EIR

A salient feature of the Framework is the proposed monitoring and reporting system. The City is proposing to develop and implement a growth monitoring system and annually prepare a Report on Growth and Infrastructure to the Mayor, City Council and the City Planning Commission. This report is intended to contain policy and program recommendations and summary information generated by the monitoring system on the City's changing circumstances, needs, and trends.

#### 2.10.5 Mitigation Measures

#### 2.10.5.1 Mitigation through Framework Policy

Policies 3.3.2, 7.10.1, 9.17.1, 9.18.1 through 9.18.4, 9.19.1, 9.20.1 through 9.20.3 contained in the General Plan Framework represent measures that would serve to lessen impacts relative to fire/EMS.

**Policy 3.3.2** directs monitoring of infrastructure and public service capacities to determine need within each CPA for improvements based upon planning standards. This policy also directs determinations of the level of growth that should correlate with the level of capital, facility, or service improvement that are necessary to accommodate that level of growth. In addition, the policy directs the establishment of programs for infrastructure and public service improvements to accommodate development in areas the General Plan Framework targets for growth. Lastly, the policy requires that type, amount, and location of development be correlated with the provision of adequate supporting infrastructure and services. **Policy 7.10.1** focuses available implementation resources in targeted areas or "communities in need." **Policy 9.17.1** addresses the monitoring and forecasting of demand for existing and future fire facilities and service for the purpose of assuring that every neighborhood would have the necessary level of fire protection service and infrastructure.

#### General Plan FEIR - Proposed Revised Findings and Statement of Overriding Considerations Page 38 (000306)

#### F. ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Among the six alternatives considered, the Framework Element is the environmentally superior alternative for the following reasons:

The No Project, Theoretical Buildout, and Transit Buildout (A1) Alternatives all permit greater levels of
population, employment, and housing than the Framework Element, and furthermore do not include policies
for managing growth and development in relationship to infrastructure capacity. The greater amounts of
permitted population, employment, and housing would result in more significant adverse environmental
impacts than the Framework Element.

# L.A. Fire Department blames budget cuts for delayed response times

In recent emergency medical cases, three of them fatal, minutes were lost because closer fire trucks had been shuttered because of cutbacks, officials say.

December 23, 2009|By Robert J. Lopez

Critical minutes were lost in two recent emergency medical calls, including one in which a woman died, because nearby Los Angeles Fire Department engines had been taken out of service because of budget cuts, according to fire officials. In both cases, units from farther away responded to the calls.

Since August, at least three people have died -- including a 3-year-old boy and a 65-year-old woman -- in incidents in which a closer fire truck had been shuttered because of cutbacks imposed by the Fire Department.

Fire officials said there is no way to tell if the outcomes in those cases would have been different had the closer units been available, but they acknowledged that time is crucial during emergency responses.

"Time counts," said Capt. Steve Ruda, a department spokesman. "The faster we can get to people in need, the more effective we can become."

Each day, the department takes 15 fire engines and nine ambulances out of service on a rotating basis to help close a \$56.5-million budget shortfall. Other departments across the city have also been forced to slash their budgets in the face of a growing deficit.

On Sunday, a 22-year-old woman suffered cardiac arrest in the Harvard Park area of South Los Angeles. She was later pronounced dead at a hospital, the Fire Department said.

Normally, the closest paramedic-staffed engine would have been a half-mile away. However, that engine had been shut down and a unit 1.7 miles away responded instead, arriving four minutes after the alarm was sounded, according to fire officials. An ambulance with two paramedics took eight minutes to get to the scene.

The department's goal is to have the first unit arrive within five minutes 90% of the time, said Battalion Chief Ronnie Villanueva.

In emergencies involving patients in cardiac arrest, he said, irreversible brain damage occurs within four to six minutes. "That's why we try to get our response times under five minutes," he said.

On Friday, a 55-year-old woman suffered, but survived, an apparent stroke at the Chatsworth Metrolink station.

One of the paramedic-staffed fire units usually on duty had been shuttered, while the two other units at that station had been sent to a rescue call minutes earlier, officials said. The firehouse is about a half-mile from the train depot.

It took the next closest fire engine seven minutes to arrive after traveling 3.4 miles, officials said. The closest available paramedic ambulance had to travel 3.2 miles and took 11 minutes to get to the scene, according to the department.

"There will be increased response times," Ruda said of the Chatsworth incident. "That's part of the sacrifice in order to meet the monetary budget."

robert.lopez@latimes.com

# Los Angeles Fire Department Protests Budget Cuts

Dozens of firefighters from the Los Angeles City Fire Department (LAFD) arrived at city hall, signs in hand for an informational picket to oppose budget cuts scheduled to begin tomorrow. Firefighters then sat quietly in city council chambers to show the council their concern for public and firefighter safety. According to firefighters, the cutbacks may save money but will put lives at risk by increasing response time.

"I don't think the normal person understands the lack of coverage they're going to get because of these brownouts. The level of service decreases exponentially because of this," LAFD Capt. Greg Malais told ABC 7.

Starting tomorrow morning, the city plans to start the "Modified Coverage Plan" proposed by Fire Chief Douglas Barry. The plan eliminates 15 fire engines and 9 ambulances every day on a rotating basis in order to reduce spending by \$39 million.

"Just last week at Fire Station 15, we had a structure fire in our first end district where if our truck company had not of been there, instead of having one structure on fire we would have had three," LAFD Capt. Arthur Burgess said to ABC 7.

Chief Barry acknowledges that response times and workload will increase, but all city fire stations will stay open with at least one active fire truck and ambulance.

The United Firefighters of Los Angeles City Local 112, who organized the public information campaign today in front of city hall, accuses the city of using the cutbacks as a negotiating tool in contract talks, according to ABC 7.

Los Angles City Councilwoman Janice Hahn explains, "They're willing to give up their sick pay payout, they're willing to give up their uniform allowance for a year and they think that'll save about \$4 million which would keep, for the month of August, all of the stations fully operational." The Councilwoman has a plan in motion to try to work out that arrangement.

Brownouts are still slated to start tomorrow morning where firefighters normally assigned to the units will be shifted to fill vacancies on other trucks and ambulances, saving overtime pay.

# State of the Cities in 2011: Infrastructure a Prerequisite for Economic Success March 18, 2011 by Caitlin Geary

# This is the fifth in a seven-part series about mayors' 2011 State of the City speeches.

In difficult economic times, the need to invest in city infrastructure—transportation, public works and technology—does not decline. Rather, residents still expect usable roads, transit options, clean water and technological advances. And as cities struggle to maintain economic competitiveness, mayors recognize that city infrastructure is the necessary shell that allows cities to develop their economies and attract new investment.

In their State of the City addresses, mayors routinely stressed the importance of infrastructure investment as a way, not only to increase quality of life, but to create jobs and spur development. Their focus is on the future of their cities.

For instance, Mayor Benjamin of Columbia, S.C., declared that "if we're going to lead on job creation, we must first lead on transportation." His intention is to promote public transportation in an entirely different way than the city has in the past, which includes energy efficient buses, regional transportation hubs and inter-modal options. "This is about a new vision that sees public transportation not as a burden to be carried but a boon that can carry us into a bright new future together," he said.

In addition, one major aspect of Mayor Jim Suttle's speech of Omaha, Neb., was the city's recent efforts to develop a Transportation Master Plan in order to ensure the mobility of residents now and into the future. "Transportation connects our community and we want to see policies providing choices in mobility to the citizens of Omaha. The goal is to determine the most effective and efficient choices for moving people throughout our city," he said.

Even smaller cities like Greenville, Miss., that rely heavily on investment from small businesses, realize the connection between infrastructure development and the ability to attract businesses and create jobs. That is why Mayor Hudson declared that the city is working to deliver broadband internet throughout the city so that businesses are able to interact with suppliers and customers. "We must be able to deliver the goods of our local businesses to the world that awaits and that is willing to buy," she said.

Mayors attributed their infrastructure successes to the productive use of available sources of funding. In Bowie, Md., Mayor Frederick Robinson declared that the city had been successful in obtaining almost \$2 million in federal, state and foundation grants for capital projects. And in West Palm Beach, Fla., Mayor Frankel stressed the importance of federal and state funding for infrastructure projects, which have in turn improved the lives of residents and created hundreds of jobs.

Cities are already seeing the positive economic effects of their infrastructure investments, and mayors have no plans to curtail infrastructure advances that will play a major role in local economic recovery. Rather, cities like Bowie, Md. and Syracuse, N.Y., plan to be even more proactive about seeking federal funding to support city operations and work with their city councils to make the process for obtaining federal Community Development Block Grant (CDBG) funds more professional, transparent and results-oriented.

Echoing <u>NLC's recent call for continued CDBG funding</u> at the local level, Joe Scarborough, the Tuesday afternoon general session speaker at the NLC Congressional City Conference put partisan politics aside for the session to voice his concern for the federal government's apparent lack of concern for "domestic development," as he termed it. The emphasis on infrastructure investment in the 2011 State of the City speeches is on-the-ground evidence that this "domestic development," and the resources required to fund it, are necessary prerequisites for local economic success.

Case No.

# IN THE SUPREME COURT OF THE STATE OF CALIFORNIA

# NEIGHBORS FOR SMART RAIL, a non-profit California corporation, *Petitioner and Appellant*

v.

# EXPOSITION METRO LINE CONSTRUCTION AUTHORITY, EXPOSITION METRO LINE CONSTRUCTION AUTHORITY BOARD, *Respondents*,

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY; LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY BOARD, *Real Parties-in-Interest and Respondents.* 

> AFTER A DECISION BY THE COURT OF APPEAL SECOND APPELLATE DISTRICT, DIVISION EIGHT CASE NO. B232655

LOS ANGELES COUNTY SUPERIOR COURT CASE NO. BS125233 HONORABLE THOMAS I. MCKNEW, JR.

# **PETITION FOR REVIEW**

JOHN M. BOWMAN, SBN 137383 C.J. LAFFER, SBN 260546 ELKINS KALT WEINTRAUB REUBEN GARTSIDE LLP 2049 Century Park East, Suite 2700 Los Angeles, CA 90067 Telephone: (310) 746-4400 Facsimile: (310) 746-4499 Attorneys for Petitioner and Appellant NEIGHBORS FOR SMART RAIL

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OTHER AUTHORITIES
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Cal. Code Regs., tit 14, § 1506520
Cal. Code Regs., tit 14, § 1509127
Cal. Code Regs., tit 14, § 1512510, 13, 14, 20
Cal. Code Regs., tit 14, § 15126.210, 18
Cal. Code Regs., tit 14, § 15126.620
Cal. Code Regs., tit 14, § 1513020

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# I. QUESTIONS PRESENTED FOR REVIEW

1. Under the California Environmental Quality Act ("CEQA"), Pub. Resources Code, § 21000 *et seq.*, is a public agency required to evaluate a project's potential traffic and other impacts using a baseline consisting of the existing physical conditions in the affected area during the period of environmental review, or may an agency instead elect to evaluate the impacts of a project only against projected future conditions?

2. Under CEQA, is a mitigation measure that merely identifies several possible remedial actions, all of which lie outside the lead agency's jurisdiction and control, adequate to support a finding that a significant impact of a project will be mitigated or avoided, where there is no assurance that any of the actions will be incorporated into the project or otherwise actually implemented?

# II. REASONS FOR GRANTING REVIEW

This case involves a challenge to the adequacy of the environmental impact report (the "EIR") for a controversial light rail transit line along the Exposition Corridor from Culver City to Santa Monica (the "Project"). As approved, the proposed 6.6-mile rail line will run dual tracks through primarily residential neighborhoods in Los Angeles, crossing some of the region's most congested northsouth thoroughfares at street level.

# A. The Baseline Issue

In order to determine whether a potential environmental impact of a project is significant, a lead agency must measure the impact against the existing environmental conditions in the absence of the project, which is referred to as the "baseline" for environmental analysis. The use of a proper baseline is critically important because an environmental impact may not be significant when measured against one baseline, but may be significant when measured against another.

The EIR, which was certified by Respondent Exposition Metro Line Construction Authority ("Expo Authority") on February 4, 2010, did <u>not</u> measure the potential traffic and air quality impacts of the Project against the existing physical conditions in the affected area as of (1) the time that environmental review had commenced (which, according to the State CEQA Guidelines,<sup>1</sup> will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant); (2) the date of EIR certification and Project approval; or (3) the anticipated date of Project completion. Rather, in preparing the EIR, the Expo Authority "elected" to evaluate these potential impacts only against a long-range forecast of future conditions in the year 2030 – two decades after Project approval and 15 years after the date that the Project is expected to commence operations.

In its published opinion upholding the EIR (the "Opinion" or "Op."),<sup>2</sup> the Second District Court of Appeal held for the first time

<sup>2</sup> The Opinion is attached to this Petition as Exhibit "A."

<sup>&</sup>lt;sup>1</sup> "Guidelines" refers to the regulations codified in title 14, sections 15000 *et seq*. of the California Code of Regulations, which have been "prescribed by the Secretary of Resources to be followed by all State and local agencies in California in the implementation of [CEQA]." Guidelines, § 15000..

that a public agency's use of projected future conditions as the sole baseline for evaluating a project's environmental impacts is proper, so long as the agency's predictions regarding such future conditions are supported by substantial evidence. In reaching this conclusion, the Second District expressly disagreed with the Sixth District's decision in Sunnyvale West Neighborhood Ass'n. v. City of Sunnyvale (2010) 190 Cal.App.4th 1351 and with the Fifth District's decision in Madera Oversight Coalition, Inc. v. County of Madera (2011) 199 Cal.App.4th 48, each of which expressly held that an EIR must include an evaluation of a project's potential effects on the environment using a baseline consisting of the existing conditions during the period of environmental review. Consequently, there is now a clear split of authority on what constitutes a proper environmental baseline. Moreover, the Opinion clears the way for public agencies to dramatically curtail the scope of EIR's by omitting relevant information concerning the impacts of projects on the existing environment, thereby precluding informed decision-making and informed public participation in contravention of CEQA's mandates.

Throughout California, government agencies, project proponents, EIR preparers, and the public need clarity on the baseline question, which is fundamental to the manner in which environmental analyses are conducted under the California Environmental Quality Act ("CEQA"), Pub. Resources Code, §§ 21000 *et seq.* Review by this Court is critical to securing uniformity of decision and to settle this important question of law.

# **B.** Adequacy of Mitigation Measures

The EIR acknowledges that without mitigation, the Project will have a significant adverse impact on surrounding neighborhoods because the demand for parking will exceed the supply at several proposed stations. (Op. at 31.) To mitigate this impact, the EIR relies upon a mitigation measure that only requires Respondent and Real Party in Interest Los Angeles County Metropolitan Transportation Authority ("Metro") to "work with the appropriate local jurisdiction and affected communities to assess the need for and specific elements of a permit parking program for the impacted neighborhoods," and identifies several other "mitigation options" for those locations where spillover parking impacts cannot be addressed through a permit parking program, including "time-restricted, metered, or shared parking arrangements." (Op. at 32.) However, all of the identified "options" are outside of Metro's jurisdiction and control, and there is no requirement that any of these options actually be implemented.

Despite the obvious uncertainty as to whether any of the remedial actions identified in this amorphous mitigation measure will ever be implemented, and despite the fact that implementation of these actions is squarely outside the jurisdiction and control of Expo Authority and Metro, the EIR nevertheless concluded that the identified mitigation measure would reduce the spillover parking impacts of the Project to a less than significant level. The published Opinion upholds this conclusion, stating that there is no reason to "assume" that the measures won't be implemented by the affected cities simply because Expo Authority cannot require the cities to do so. (Op. at 34.)

The Opinion's discussion regarding the adequacy of this and similar mitigation measures in the EIR represents a stark departure from established law, including numerous reported decisions holding that that a mitigation measure that merely states a "generalized goal" of mitigating a significant environmental effect without committing to any specific criteria or standard of performance violates CEQA by improperly deferring the formulation and adoption of enforceable measures. See, e.g., San Joaquin Raptor Rescue Center v. County of Merced (2007) 149 Cal.App.4th 645, 670 and Communities for a Better Environment v. City of Richmond (2010) 184 Cal.App.4th 70, 93. See also Federation of Hillside & Canyon Associations v. City of Los Angeles (2000) 83 Cal.App.4th 1252, 1260 (holding that the agency's finding that mitigation measures had been "required in, or incorporated into" the project was not supported by substantial evidence because there was "great uncertainty as to whether the mitigation measures would ever be funded or implemented" and no policy would prevent development of the project without mitigation). The Opinion also conflicts with the holding of the Fourth District Court of Appeal in a decision that is currently pending before this Court. See City of San Diego v. Trustees of the California State University, Case No. S199557 (D057446; 201 Cal. App.4th 1134) (holding that a mitigation measure that required San Diego State University to develop a campus Transportation Demand Management program in consultation with specified regional planning agencies, but did not commit the University to take any specific mitigation measures to reduce vehicle trips or provide any objective performance standards by which the success of any mitigation measures can be measured, constitutes improper deferral of mitigation).

The Opinion, if allowed to stand, will significantly erode established principles of law regarding an agency's duty to mitigate, to the extent feasible, the potential impacts of those projects they propose to approve or carry out. Review should be granted in order to clarify that a mitigation measure that merely identifies a laundry list of actions that other agencies could or should take, but does not actually require that any of the actions be incorporated into the project or otherwise required as conditions of approval, constitutes improper deferral and cannot support a finding that the impact will be reduced to a level of insignificance.

# III. FACTUAL AND PROCEDURAL BACKGROUND

On February 12, 2007, the Expo Authority issued a Notice of Preparation ("NOP") announcing its intent to prepare an EIR for the Project, known as the Exposition Corridor Transit Project Phase 2 ("Expo Phase 2"), thereby initiating the Project's environmental review period. Administrative Record ("AR") at 156, 20839.

On January 28, 2009, Expo released a draft EIR for the Project, which described and evaluated six project alternatives, including four light rail alternatives with slightly different alignments, each beginning in Culver City and ending in downtown Santa Monica. (Op. at 5.) The Project, identified as Light Rail Transit ("LRT") Alternative 2, included four consecutive at-grade (*i.e.*, surface) crossings of major north/south thoroughfares, from and including Overland Avenue, Westwood Boulevard, Military Avenue, and

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Sepulveda Boulevard. Light rail trains would pass through the atgrade crossings of these major north/south streets 280 times per day (one train every 2 ½ minutes during peak periods), thereby severely impeding the flow of automobile traffic on already congested streets. AR at 21, 368, 382, 38388.

During the public comment period, the Expo Authority received thousands of comments from public agencies, individuals, homeowners' associations, and businesses regarding the potential traffic and other impacts of the Project, including the Project's impacts on public safety. For example, the City of Los Angeles Department of Transportation, the Los Angeles Unified School District, and others expressed concerns regarding the potential safety hazards associated with the at-grade Overland Avenue crossing, which is immediately adjacent to an elementary school. AR at 1181-1192, 1265-1271, 1764-1767.

On February 4, 2010, the Expo Board certified the final EIR and approved the Project. (Op. at 6-7.) The EIR described the physical conditions in the vicinity of the Project as they existed at the time of environmental review. However, the EIR did not use the existing conditions as the baseline for evaluating the Project's potential traffic and air quality impacts. Rather, the EIR measured the Project's traffic and air quality impacts only against a long-range forecast of future conditions in the year 2030. AR at 242, 346-347, 505-510, 1057, 10722, 10737. The EIR and the Expo Authority assumed that the Project would be completed and operational by 2015. AR at 1063, 1130, 1307, 4017, 14956, 28926. Thus, the EIR

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failed to evaluate or discuss the traffic and air quality impacts of the Project for the first fifteen years of its operation.

In its findings, the Expo Board further acknowledged that the EIR used only "future" (rather than existing) baseline conditions in assessing the traffic and air quality impacts:

For most of the environmental topics in the FEIR and in these Findings, the Authority finds that existing environmental conditions are the appropriate baseline condition for the purpose of determining whether an impact is significant. However, the Authority ... is *electing* to utilize the *future baseline conditions* for the purposes of determining the significance of impacts to traffic and air quality.

AR at 17 (emphasis added).

The EIR concluded that the Project would have "significant and unavoidable" impacts on aesthetics and air quality (during construction). In all other respects, the final EIR concluded that the Project's potential impacts would either be less than significant or would be reduced to a "less than significant" level by implementing specified mitigation measures. For example, the EIR concludes that without mitigation, the Project would have a significant impact on the existing parking supply because the demand for parking "will exceed the proposed supply at several stations, potentially resulting in some parking intrusion into adjacent neighborhoods." (Op. at 31.) However, the EIR further concludes that the impacts associated with station spillover parking would be reduced to a less than significant level by adopting a mitigation measure that requires Metro to "work with the appropriate local jurisdiction and affected communities" on

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the elements of a permit parking program for the impacted neighborhoods. (Op. at 32.)

Petitioner Neighbors For Smart Rail ("NFSR"), a non-profit corporation comprised of a coalition of community residents, organizations and other interested persons, filed a petition for writ of mandate challenging the adequacy of the EIR under CEQA. Judgment was entered denying the petition on March 4, 2011. 3 Joint Appendix ("JA") 0745-746. NFSR subsequently appealed the judgment to the Court of Appeal for the Second Appellate District (the "Court of Appeal"). 3 JA 0806-809. On April 17, 2012, the Court of Appeal filed its opinion affirming the trial court's decision. A copy of the Opinion is attached hereto as Exhibit "A."

The Opinion was originally certified for publication with the exception of parts 3 through 8 of the Discussion (parts 1 and 2 of the Discussion concerned the standard of review and the baseline issue). On May 7, 2012, Metro submitted a letter requesting publication of parts 5 (cumulative traffic impacts), 6 (adequacy of mitigation measures), 7 (project alternatives), and 8 (recirculation). A copy of this request is attached hereto as Exhibit "B." On May 9, 2012, the Court of Appeal granted Metro's request. A copy of the Court of Appeal's publication order is attached hereto as Exhibit "C."

A petition for rehearing was not filed.

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# IV. DISCUSSION

# A. Review Should Be Granted to Settle an Important Question of Law Regarding the Proper Baseline for Environmental Review Under CEQA and to Secure Uniformity of Decision on the Baseline Question

"An EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, from both a local and regional perspective." Guidelines, § 15125, subd. (a). (Emphasis These existing conditions "will normally constitute the added.) baseline physical conditions by which a Lead Agency determines whether an impact is significant." Id. See also Guidelines, § 15126.2, subd. (a). In the absence of an accurate baseline, "the goals of CEQA are thwarted and a prejudicial abuse of discretion has occurred." Save Our Peninsula Committee v. Monterey County (2001) 87 Cal.App.4th 99, 128. See also Citizens for East Shore Parks v. California State Lands Comm. (2011) 202 Cal.App.4th 549, 557 ("[A]n inappropriate baseline may skew the environmental analysis flowing from it, resulting in an EIR that fails to comply with CEQA.").

This Court recently affirmed that an EIR must analyze a project's impacts in comparison to actual physical conditions existing in the area affected by the project at the time of analysis. Specifically, in *Communities for a Better Environment v. South Coast Air Quality Management District* (2010) 48 Cal. 4th 310 ("*CBE*"), this Court held that the South Coast Air Quality Management District (the "District") violated CEQA when it analyzed the impacts of a proposed refinery project by erroneously comparing the increased air emissions from the
project to maximum capacity limits allowed under previously issued permits, rather than existing conditions. "By comparing the proposed project to what could happen, rather than to what was actually happening," the District utilized "hypothetical" conditions as its baseline, resulting in "illusory' comparisons that 'can only mislead the public to the reality of the impacts and subvert full consideration of the actual environmental impacts" of the project. *Id.* at 322 (emphasis in the original).

In *CBE*, this Court described the limited circumstances under which agencies may deviate from the "normal" practice, pursuant to CEQA Guidelines section 15125, subd. (a), of utilizing existing environmental conditions "at the time the notice of preparation [of an EIR] is published" as the baseline, as follows:

In some circumstances, peak impacts or recurring periods of resource scarcity may be as important environmentally as average conditions. Where environmental conditions are expected to change quickly *during the period of environmental review* for reasons other than the proposed project, project effects might reasonably be compared to predicted conditions at the *expected date of approval*, rather than to conditions at the time analysis is begun. [citation omitted.] A temporary lull or spike in operations that happens to occur at the time environmental review for a new project begins should not depress or elevate the baseline; overreliance on shortterm activity averages might encourage companies to temporarily increase operations artificially, simply in order to establish a higher baseline.

*CBE*, *supra*, 48 Cal.4th at 328 (emphasis added).

Thus, while recognizing that lead agencies have some discretion to determine the baseline, this Court indicated that the

baseline must be the existing conditions during the "period of environmental review" (*i.e.*, no later than the date of EIR certification). However, this Court did not address the question that is squarely presented here: whether a lead agency is required to evaluate a project's potential traffic and other impacts using a baseline consisting of the existing physical conditions in the affected area during the period of environmental review, or may instead elect to only evaluate a project's impacts against projected future conditions beyond the period of environmental review.

# 1. The Opinion Directly Conflicts With Recent Decisions Issued by the Fifth and Sixth Appellate Districts

Citing this Court's decision in *CBE*, the Court of Appeal for the Sixth District recently rejected the use of projected future conditions as the sole baseline for evaluating the potential traffic impacts of a project in *Sunnyvale, supra*, 190 Cal.App.4th 1351. In *Sunnyvale*, an EIR was prepared for a public infrastructure improvement project using projected traffic conditions in the year 2020 as the environmental baseline, rather than the existing conditions during the period of environmental review, on the theory that this methodology offered "the most accurate and informative portrayal" of the impacts of the project. *Id.* at 1358. The City of Sunnyvale used a projected 2020 baseline because, it was assumed, the proposed street extension would "not be complete and in use" until that date. *Id.* at 1359. The *Sunnyvale* Court held that the City's use of a future baseline was improper, even if supported by substantial evidence, stating that "nothing in the law authorizes environmental impacts to be evaluated only against predicted conditions more than a decade after EIR certification and project approval." *Id.* at 1380 (emphasis added). The Court reasoned that "[w]e do not construe the word "normally," as used in Guidelines section 15125, subdivision (a)...to mean that a lead agency has carte blanche to select the conditions on some future, post-approval date as the 'baseline' so long as it acts reasonably as shown by substantial evidence." *Id.* at 1379.

Building on *CBE* and *Sunnyvale*, the Fifth District Court of Appeal recently held in *Madera Oversight Coalition, supra*, 199 Cal.App.4th 48 that an EIR for a mixed-use project did not comply with CEQA because the Court was unable to determine with certainty that the EIR had used existing (as opposed to future predicted) conditions as the baseline for determining the significance of the project's potential traffic impacts. In *Madera*, the Court specifically held as follows:

We adopt the following legal conclusions based on the precedent established by *Sunnyvale*: (a) A baseline used in an EIR must reflect existing physical conditions; (b) lead agencies do not have the discretion to adopt a baseline that uses conditions predicted to occur on a date subsequent to the certification of the EIR; and (c) lead agencies do have the discretion to select a period or point in time for determining existing physical conditions other than the two points specified in subdivision (a) of Guidelines section 15125, so long as the period or point selected predates the certification of the EIR.

### *Id*. at 90.

The *Madera* Court rejected the county's argument that the *Sunnyvale* decision went too far in limiting the lead agency's discretion, finding "the extensive analysis undertaken by the

*Sunnyvale* court to be persuasive." *Id.* at 89. The *Madera* Court also made the following important observation:

The proper interpretation of Guidelines section 15125, subdivision (a) requires an examination of what is implied by the use of the term "normally" as well as consideration of the meaning of the term "exist." *The term "exist" is especially important because it was used by the Legislature in CEQA itself*. (E.g., §§ 21060.5 ["environment" defined as the physical conditions that *exist* within the affected area], 21151, subd. (B) [when preparing an EIR, "any significant effect on the environment shall be limited to substantial, or potentially substantial, adverse changes in physical conditions which *exist* within the area"], italics added.) A regulation must be "consistent and not in conflict with the statute" to be valid. (Gov't. Code, § 11342.2.).

*Id* at 89. (italics in original; underline added).

In this case, the EIR did not use "existing" conditions as the baseline for evaluating the Project's impacts on traffic and air quality. Instead, Expo Authority "elected" to use only predicted "future" conditions in the year 2030 as the baseline for analyzing these impacts, thereby ignoring the potential traffic and air quality impacts of the Project for the first 15 years of its operation. The selected 2030 baseline year clearly falls outside the "period of environmental review" in this case (*i.e.*, from the issuance of the Notice of Preparation in 2007 to EIR certification in 2010), and bears no relationship to the date on which Project is expected to commence operations.

In its published Opinion, the Second District expressly disagrees with *Sunnyvale* and *Madera* and upholds the EIR's use of projected future (2030) conditions as the sole baseline for evaluating the Project's impact on traffic and air quality. (Op. at 4, 15-16.) The

Court of Appeal explained its reasoning as follows:

We agree with the Expo Authority and amici curiae that, in a proper case, and when supported by substantial evidence, use of projected conditions may be an appropriate way to measure the environmental impacts that a project will have on traffic, air quality and greenhouse gas emissions. As a major transportation infrastructure project that will not even begin to operate until 2015 at the earliest, its impact on *presently existing* traffic and air quality conditions will yield no practical information to decision makers or the public. An analysis of the environmental impact or the project on conditions existing in 2009, when the final EIR was issued (or at any time from 2007 to 2010), would only enable decision makers and the public to consider the impact of the rail line if it were here today. Many people who live in neighborhoods near the proposed light rail line may wish things would stay the same, but no one can stop change. The traffic and air quality conditions of 2009 will no longer exist (with or without the project) when the project is expected to come on line in 2015 or over the course of the 20-year planning horizon for the An analysis of the project's impacts on project. anachronistic 2009 traffic and air quality conditions would rest on the false hypothesis that everything will be the same 20 years later.

Op. at 14-15 (emphasis in original).

As acknowledged by the Second District, the Opinion is directly contrary to the holdings of the Sixth District in *Sunnyvale* and the Fifth District in *Madera*. Consequently, there is now a clear split of authority among the Courts of Appeal on the issue of whether an agency may omit any evaluation of the potential impacts of a project against existing conditions and instead evaluate the impacts only against projected future conditions, so long as those projections are supported by substantial evidence.

As this Court observed in CBE, "[t]o decide whether a given project's environmental effects are likely to be significant, the agency must use some measure of the environment's state absent the project, a measure sometimes referred to as the 'baseline' for environmental analysis." CBE, supra, 48 Cal. 4th at 315. See also Remy et al., Guide to the Cal. Environmental Quality Act (11th ed. 2006) p. 198 (although neither CEQA nor the Guidelines define the term "baseline," "as a conceptual matter, the determination of whether impacts are 'significant' requires a 'baseline' set of environmental conditions against which to compare a project's anticipated impacts."). With the publication of the Opinion, there is now great uncertainty among public agencies, EIR preparers, and project sponsors across the State regarding this most fundamental aspect of the environmental review process. Review by this Court is necessary to provide much-needed guidance regarding the limits of an agency's discretion to deviate from the "normal" baseline for environmental review.

2. The Opinion Misconstrues CEQA's Mandates

In addition to being a stark departure from established precedent, the Opinion reflects flawed reasoning and is contrary to the provisions and intent of CEQA in several important respects.

First, as noted by the Court in *Madera*, CEQA itself defines the term "environment" to mean "the physical conditions which exist within the area which will be affected by a proposed project ...." Pub. Resources Code, § 21060.5. Moreover, CEQA expressly requires

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that an EIR discuss the "substantial, or potentially substantial, adverse changes in *physical conditions which exist within the area* as defined in Section 21060.5." Pub. Resources Code, § 21151, subd. (b). See also Pub. Resources Code, § 21068 ("Significant effect on the environment' means a substantial, or potentially substantial, adverse change in the environment."). Although CEQA does not define the term "exist," it is generally understood to mean something having "real being." See Merriam-Webster's Collegiate Dictionary (10th ed., 1998). "Future," on the other hand, is understood to mean something "that is to be." Ibid. Thus, by assessing the impacts of the Project only against projected future conditions, Expo Authority did not evaluate the Project's traffic and air quality impacts on the "environment" as required by CEQA. Rather, Expo Authority considered only those changes to environmental conditions that are predicted to happen two decades in the future.

The Opinion does not attempt to explain how the statutory term "existing" can be reasonably construed to mean "future" in this or any other case. More importantly, the Opinion overlooks the fact that by relying solely on a comparison of two future scenarios (*i.e.*, predicted conditions in 2030 with and without the Project), the EIR in this case omits any consideration of the "relevant change," which "is identified by comparing *existing* physical conditions with the physical conditions that are predicted to exist at a later point in time, after the proposed activity has been implemented." *Wal-Mart Stores, Inc. v. City of Turlock* (2006) 138 Cal.App.4th 273, 289 (emphasis added). See also *San Joaquin Raptor Rescue Center, supra,* 149 Cal.App.4th at 658 (baseline for proposed expansion of a mining operation must be

the "realized physical conditions on the ground ..."); *Woodward Park Homeowners Ass'n., Inc. v. City of Fresno* (2007) 150 Cal.App.4th 683, 693 (effects of office and shopping center development must be compared to the current undeveloped condition of the property, rather than to an office park that could be developed under existing zoning); *Citizens for East Shore Parks, supra,* 202 Cal.App.4th at 558 ("[T]o afford meaningful environmental review of a proposed project's impact, a CEQA baseline must reflect 'the 'existing physical conditions in the affected area' [citation], that is the 'real conditions on the ground' [citation] ...").

Second, the Opinion rests on the flawed premise that the Project's impact "on presently existing traffic and air quality conditions will yield no practical information to decision makers or the public." (Op. at 15.) On the contrary, by relying on a comparison of two future (2030) scenarios, the EIR omits any consideration of possible traffic and air quality impacts of the Project during the 15 year period following the commencement of operations. See Guidelines, § 15126.2, subd. (a) ("Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects.") For example, in this case, NFSR demonstrated that, based on information contained in the EIR, the level of service ("LOS") at several street intersections along the Project alignment could potentially fall from an acceptable LOS of A through D to an unacceptable LOS of E or F during the first 15 years of Project operations - a potential significant impact that the EIR did not even consider. Respondents argued below that such impacts are not likely

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to occur, but did not – and cannot – show where this issue is even discussed in the EIR. 2 JA 466-469. As this Court observed in *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal. 4th 412, 443, the "audience to whom an EIR must communicate is not the reviewing Court but the public and the government officials deciding on the project." In this case, it is undisputed that, by relying solely on a 2030 baseline, the EIR did not evaluate or discuss the Project's potential impacts on nearby street intersections from 2015 to 2030. See *Santiago County Water Dist. v. County of Orange* (1981) 118 Cal.App.3d 818, 829 ("[T]he ultimate decision of whether to approve a project, be that decision right or wrong, is a nullity if based upon an EIR that does not provide the decision-makers, and the public with the information about the project that is required by CEQA.").

Third, the Opinion suggests that in order to evaluate the environmental impacts of a "major transportation infrastructure project," predicted future conditions must be used as the baseline and that use of existing conditions would be improper. (Op. at 15.) However, this rationale presents a false choice. It is not uncommon (or particularly difficult) for an EIR to evaluate certain impacts of a project using both existing conditions and projected future conditions as a baseline. See *Pfeiffer v. City of Sunnyvale* (2011) 200 Cal.App.4th 1552, 1571-1572 (upholding an EIR that used multiple baselines, including both existing conditions and future conditions, in its analysis of the project's traffic impacts). Furthermore, as the Sixth District observed in *Sunnyvale*, just because an EIR must include an evaluation of the impacts of the project using existing conditions as

the baseline does not mean "that discussions of the foreseeable changes and expected future conditions have no place in an EIR." Sunnyvale, supra, 190 Cal.App.4th at 1381. Specifically, in addition to evaluating "project specific" impacts, an EIR must separately discuss the potential cumulative impacts of a project "when the project's incremental effect is cumulatively considerable," which "means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." Guidelines, §§ 15130, subd. (a) and 15065, subd. (a)(3). This discussion, which must include either a list of past, present, and "probable future projects" producing related or cumulative impacts, or a "summary of projections contained in an adopted general plan or related planning document...," must necessarily consider future conditions. Guidelines, § 15130, subd. (b)(1). Moreover, in evaluating the required "no project" alternative, an EIR must discuss the existing conditions "as well as what would be reasonably expected to occur in the foreseeable future in the project were not approved, based on current plans and consistent with available infrastructure and community services." Guidelines, § 15126.6, subd. (e)(3)(C). See also Guidelines, § 15125, subd. (e) ("Where a proposed project is compared with an adopted plan, the analysis shall examine the existing physical conditions ... as well as the potential future conditions discussed in the plan."). Thus. requiring an EIR to evaluate the impacts of a project using existing conditions does not mean that future conditions will be overlooked. On the other hand, omitting any evaluation of the impacts of a project

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as compared to existing conditions during the period of environmental review would effectively conflate CEQA's requirement for separate analyses of project-specific impacts, cumulative impacts, and the "no project" alternative into one – which is precisely what occurred in this case.

Fourth, by effectively relieving agencies of the duty to evaluate a project's impacts on the physical conditions which "exist" within the area which will be affected by a proposed project (Pub. Resources Code, § 21060.5), the Opinion allows agencies to evaluate a Project's potential impacts entirely within the abstract confines of long range forecasts, which are subject to substantial error over time and can be easily manipulated by "experts" to support a desired conclusion. Although projections of future conditions may provide a useful analytical tool, they are inherently less reliable than existing conditions, which can be directly observed and measured during the period of environmental review. Thus, for example, while existing traffic conditions at street intersections can be independently verified with traffic counts, projected future traffic conditions—which cannot be verified—provide fodder for the inevitable "battle of the experts."

Finally, the Opinion conflicts with the Legislature's intent that CEQA "be interpreted in such manner as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." *Friends of Mammoth v. Bd. of Supervisors* (1972) 8 Cal. 3d 247, 259. Specifically, by allowing lead agencies to use projected future conditions as the sole baseline for environmental analysis, the potential short- and medium-term impacts of projects will be ignored. As such, the Opinion interprets CEQA in a manner

that will limit the CEQA's effectiveness in protecting the environment.

B. Review Should Be Granted to Clarify that a Mitigation Measure that Merely Identifies Actions that Could Be Taken By Other Public Agencies Without Actually Requiring the Implementation of Any of the Identified Actions, Constitutes Improper Deferral and Does Not, Standing Alone, Support a Finding that the Impact Will Be Reduced to a Less that Significant Level

"Each public agency shall mitigate or avoid the significant effects on the environment of projects that it carries out or approves whenever it is feasible to do so." Pub. Resources Code, § 21002.1, subd. (b). In order to achieve this goal, lead agencies "shall provide that measures to mitigate or avoid significant effect on the environment are fully enforceable through permit conditions, agreements, or other measures," and must adopt a monitoring program to ensure that the mitigation measures are implemented. Pub. Resources Code, § 21081.6. As aptly noted by the Court in *Federation of Hillside & Canyon Associations, supra*, 83 Cal.App.4th at 1261 (emphasis in original): *"The purpose of these requirements is to ensure that feasible mitigation measures will actually be implemented as a condition of development, and not merely adopted and then neglected or disregarded."* 

Here, the EIR acknowledged that without mitigation, the Project could have a significant adverse impact because "demand for parking will exceed the proposed supply at several stations, resulting in some parking intrusion into adjacent neighborhoods." AR at 178-9, 413. For example, the Expo/Westwood station is expected to have

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over 5,000 daily boardings, yet no off-street parking spaces will be provided at the station. AR at 412, 414. To mitigate this potentially significant impact, the EIR relies upon mitigation measure MM TR-4, which provides, in relevant part, as follows:

In the quarter mile area surrounding each station where spillover parking is anticipated, a program shall be established to monitor the on-street parking activity in the area prior to the opening of service .... If a parking shortage is determined to have occurred ... due to the parking activity of the LRT patrons, Metro shall work with the appropriate local jurisdiction and affected communities to assess the need for and specific elements of a permit parking program for the impacted neighborhoods. ... Metro shall reimburse the local jurisdictions for the costs associated with developing the local permit parking programs .... Metro will not be responsible for the costs of permits for residents desiring to park on the streets in the permit districts. For those locations where station spillover parking cannot be addressed through the implementation of a permit parking program, alternative mitigation options include metered. time-restricted, or shared parking Metro will work with the local arrangements. jurisdictions to determine which option(s) to implement.

AR at 413-414 (emphasis added).

In reliance on this measure, the EIR concludes, and Expo Authority found, that the station-area spillover parking impacts would be "less than significant." AR at 54, 413-414.

NFSR challenged Expo Authority's finding on the ground that MM-TR4 was inadequate as a matter of law. Specifically, NFSR argued that only requiring Metro to "work with" local agencies and affected communities to "assess" the need for a permit parking program provides absolutely no assurance that any such program will ever be formed or that the impacts will ever be mitigated.<sup>3</sup> NFSR further argued that MM-TR4 constitutes improper deferral of mitigation and is legally inadequate because all of the actions identified in MM TR-4, including the specified "back up" options (*i.e.*, time-restricted, metered, or shared parking), must be approved and/or implemented by other public agencies, and are therefore beyond Expo Authority's control. In other words, "working with" is fundamentally different than "doing." See Federation of Hillside & Canyon Associations, supra, 83 Cal.App.4th at 1260-62 (holding that traffic mitigation measures identified in an EIR for a general plan amendment did not comply with CEQA because they were not "incorporated into the project or required as a condition of project approval in a manner that will ensure their implementation"); San Joaquin Raptor Rescue Center, supra, 149 Cal.App. at 670 (mitigation measure that merely states a "generalized goal" to mitigate a significant effect without committing to any specific criteria or standard of performance violates CEQA); Communities, supra, 184 Cal.App.4th at 93 (mitigation plan that merely proposes a generalized goal of no net increase in greenhouse gas emissions and then sets out a handful of cursorily described mitigation measures for future consideration is deficient).

The Opinion rejects NFSR's arguments and concludes that MM TR-4 is adequate to support a finding that the Project's spillover

<sup>&</sup>lt;sup>3</sup> Indeed, in the City of Los Angeles, such programs not only require the approval the City Council, but also an affirmative vote of the majority of residents in the affected area.

parking impacts will be mitigated to a less than significant level. (Op. at 33-34.) In support of this conclusion, the Opinion states as follows:

Nor do we accept the claim that the measure is inadequate for lack of "assurance" that permit parking programs will be formed and effective in preventing spillover parking. The mitigation measure sets forth a specific performance standard – monitoring parking activity to determine if LRT activity increases parking utilization to 100 percent – and if it does, Metro undertakes to work with local jurisdictions, to follow their guidelines for permit parking programs, and to reimburse their costs. ... We will not assume, as petitioner implicitly suggests, that simply because Expo Authority cannot require a local jurisdiction to adopt a permit program, the mitigation measure is inadequate.

## Ibid (emphasis added).

Notably, while the Opinion declines to "assume" that MM-TR4 is inadequate, it offers no explanation as to how MM-TR4 meets the standards discussed in the authorities cited above. Even if a program to "monitor the on-street parking activity" could somehow be construed as a "performance standard," nothing in MM-TR4 requires the eventual achievement of any particular standard. Moreover, the Opinion fails to confront the fundamental underlying problem. Specifically, when parking utilization reaches 100 percent, Expo Authority lacks the legal authority to implement a parking permit program or any of the other actions identified in MM-TR4, and there is no evidence in the record to support a conclusion that the relevant local jurisdictions could and would implement such measures.

Where a project may have environmental impacts "for which mitigation is known to be feasible, the EIR may give a lead agency a choice of which measures to adopt, so long as the measures are

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coupled with specific and mandatory performance standards to ensure that the measures, as implemented, will be effective." *Communities*, *supra*, 184 Cal.App.4th at 94. For example, in *Sacramento Old City Ass'n. v. City Council* (1991) 229 Cal.App.3d 1011, 1028-1029, the Court upheld an EIR that set forth a range of mitigation measures to offset a project's significant traffic impacts where performance criteria would have to be met, even though the EIR did not specify which measure had to be adopted by the city. However, in *Sacramento Old City*, each of the measures identified in the EIR were within the City's power to implement. In contrast, the measures identified in MM-TR4 are outside Expo Authority's jurisdiction and control, and there is no actual requirement that any of these measures be implemented by the relevant local jurisdictions.<sup>4</sup>

To the extent feasible, lead agencies must mitigate the significant impacts of those projects that they decide to carry out.

<sup>4</sup> The deficiencies in MM-TR4 are also present in mitigation measure MM SAF-1, which was adopted to mitigate the Project's potential impacts on public safety. Specifically, the EIR acknowledges that the Project could impede emergency responder's access to residential neighborhoods, but asserts that these impacts would be reduced to level of insignificance by implementing MM SAF-1, which requires that Metro "coordinate" with the affected cities, "inform" them of Metro's emergency response procedures, "provide a detailed description" of its emergency response procedures so as to provide such agencies with "knowledge" of Metro's response plan, and "encourage" the cities to update their procedures to address implementation of an LRT Alternative. (AR at 726-7.) Of course, neither Metro nor Expo Authority has any power to compel the affected cities to update their response procedures (e.g., Fire Department response times), and there is no actual requirement that cities' response procedures be updated.

This requires the adoption of enforceable measures whose implementation will actually result in the mitigation of impacts, rather than solely relying on the mere possibility that a different agency may mitigate the identified impact.

The Opinion is the first reported case upholding a mitigation measure that relies entirely on actions that the lead agency has no power to implement. As such, it represents a significant departure from established law, and provides a roadmap for lead agencies to evade their mitigation duties under CEQA by simply shifting them to other agencies. Review should be granted in order to clarify that CEQA requires lead agencies to do more than simply establish a "to do" list for other agencies.<sup>5</sup>

## V. CONCLUSION

For the reasons stated herein, this Court should grant review in order to resolve important questions of law concerning the appropriate

<sup>&</sup>lt;sup>5</sup> Without elaboration, the Opinion cites Pub. Resources Code § 21081 and Guidelines,  $\S$  15091, subd. (a)(2), which provide that an agency may find that changes that will avoid or lessen a significant environmental effect "are within the responsibility and jurisdiction of another public agency" and "can and should be adopted by such other agency." (Op. at 30, 34.) However, Expo Authority did not make this finding in this case. Rather, Expo Authority made the finding specified in Guidelines,  $\S$  15091, subd. (a)(1) ("Changes or alterations" have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR".). (AR at 54-55.) Moreover, even if Expo Authority had made the finding set forth in Guidelines, § 15091, subd. (a)(2), such a finding would not support the EIR's conclusion that MM-TR4 will mitigate the Project's potential spillover parking impacts to a less than significant level, because there is no assurance that other agencies would in fact implement any of the identified measures.

baseline for environmental review under CEQA and the adequacy of mitigation measures, and to secure uniformity of decision on the "baseline" issue.

DATED: May 25, 2012

# ELKINS KALT WEINTRAUB REUBEN GARTSIDE LLP

By:

John M. Bowman Attorney for Neighbors for Smart Rail, Plaintiff and Appellants

202016v7

## **CERTIFICATE OF WORD COUNT** (Cal. Rules of Court, Rule 8.504(d)(1))

This Petition for Review contains 7,617 words as counted by the Microsoft Word version 2007 word processing program used to generate the petition.

DATED: May 25, 2012

# ELKINS KALT WEINTRAUB REUBEN GARTSIDE LLP

By:

JOHN M. BOWMAN Attorneys for Neighbors For Smart Rail, Petitioner and Appellant

202016v7

# **EXHIBIT** A

Filed 4/17/2012

## **CERTIFIED FOR PARTIAL PUBLICATION\***

#### IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA

SECOND APPELLATE DISTRICT

**DIVISION EIGHT** 

COURT OF APPEAL - SECOND DIST.

NEIGHBORS FOR SMART RAIL,

B232655

Apr 17, 2012 JOSEPH A. LANE, Clerk B. FISHER Deputy Clerk

Plaintiff and Appellant,

(Los Angeles County Super. Ct. No. BS 125233)

v.

EXPOSITION METRO LINE CONSTRUCTION AUTHORITY et al.,

Defendants and Respondents;

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY et al.,

Real Parties in Interest.

APPEAL from a judgment of the Superior Court for the County of Los Angeles. Thomas I. McKnew, Jr., Judge. Affirmed.

Elkins Kalt Weintraub Reuben Gartside, John M. Bowman and C.J. Laffer for Plaintiff and Appellant.

\* Pursuant to California Rules of Court, rules 8.1100 and 8.1110, this opinion is certified for publication with the exception of parts 3 through 8 of the Discussion.

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Cox, Castle & Nicholson, Michael H. Zischke, Andrew B. Sabey and Rachel R. Jones for League of California Cities and California State Association of Counties as Amici Curiae on behalf of Respondents and Real Parties in Interest.

Carmen A. Trutanich, City Attorney, Andrew J. Nocas, Supervising City Attorney, Timothy McWilliams and Siegmund Shyu, Deputy City Attorneys, for City of Los Angeles as Amicus Curiae on behalf of Respondents and Real Parties in Interest.

## SUMMARY

This appeal arises under the California Environmental Quality Act (CEQA; Pub. Resources Code, § 21000 et seq.)<sup>1</sup> and involves the second phase of the construction of a light rail line along the Exposition Corridor connecting downtown Los Angeles with Santa Monica. The first phase, approved in 2005, will run from downtown Los Angeles to Culver City. The second phase (the project or Expo Phase 2) consists of the proposed construction of 6.6 miles of light rail line from the terminus of the first phase in Culver City to Santa Monica. On February 4, 2010, the Board of the Exposition Metro Line Construction Authority (the Expo Authority) approved the project and certified as adequate and complete a final environmental impact report (EIR) for the project.<sup>2</sup>

CEQA describes the EIR as an informational document. Its purpose is to provide public agencies, and the public, with detailed information about the effect a proposed project is likely to have on the environment; to list ways in which the significant effects of a project might be minimized; and to identify alternatives to a project. (§ 21061.) Neighbors for Smart Rail (petitioner), a nonprofit California corporation comprised of a coalition of homeowners' associations, community groups and unaffiliated citizens, sought a writ of mandate. Petitioner asked the trial court to order the Expo Authority to vacate and set aside its approval of the EIR and other project approvals. The trial court denied the petition.

Petitioner appeals, arguing that the Expo Authority used an improper baseline for analyzing the impacts of the project on traffic, air quality and greenhouse gas emissions. Petitioner contends the Expo Authority improperly evaluated the significance of those

<sup>&</sup>lt;sup>1</sup> All statutory references are to the Public Resources Code unless otherwise specified.

<sup>&</sup>lt;sup>2</sup> The Expo Authority was created by statute in 2003 for the purpose of awarding and overseeing final design and construction contracts for completion of the light rail project from downtown Los Angeles to Santa Monica. (Pub. Util. Code, §§ 132600, 132605.) The Los Angeles County Metropolitan Transportation Authority (Metro) and its Board are real parties in interest.

environmental impacts using baseline conditions in 2030. According to petitioner, the Expo Authority should have used baseline conditions that existed sometime between 2007, when the notice of preparation of the Expo Phase 2 project was filed, and 2010, when the Expo Authority certified the final EIR. The use of hypothetical future conditions as the baseline for analyzing the environmental impacts of the project, petitioner argues, violates CEQA, as held in *Sunnyvale West Neighborhood Assn. v. City of Sunnyvale City Council* (2010) 190 Cal.App.4th 1351, 1382-1383 (*Sunnyvale*) and *Madera Oversight Coalition, Inc. v. County of Madera* (2011) 199 Cal.App.4th 48, 90 (*Madera*).

Petitioner also contends the EIR was inadequate on several other grounds, arguing (1) the traffic analysis failed to address potential traffic impacts on Sepulveda Boulevard, which serves as a de facto alternative route when traffic is particularly bad on the Interstate 405 Freeway (I-405); (2) the analysis of growth-inducing impacts did not discuss the potential impacts of concentrating new development around the planned transit stations; (3) the analysis of cumulative traffic impacts did not consider the localized traffic impacts of related projects, in particular the Casden Project, a probable future mixed-use project adjacent to the proposed Sepulveda transit station; (4) mitigation measures were inadequate (and improperly deferred) to reduce adverse impacts related to parking, noise and vibration, safety and construction; and (5) the EIR failed to adequately evaluate grade separation as a design alternative to at-grade crossings between Overland Avenue and Sepulveda Boulevard.

Finally, petitioner contends the Expo Authority made "major changes" after circulation of the draft EIR, but failed to recirculate the EIR and permit additional comment, as is required when significant new information is added to an environmental impact report after notice and public comment but before certification.

We find no merit in petitioner's contentions and affirm the judgment. Because we disagree with *Sunnyvale* and *Madera*, and hold that use of projected future conditions as a baseline for analyzing environmental impacts is proper in this case, we publish that portion of our opinion.

#### FACTUAL AND PROCEDURAL BACKGROUND

The project under review is called the Exposition Corridor Transit Project Phase 2, referred to in the EIR as "Expo Phase 2." Its purpose is to extend high-capacity, high-frequency transit service from the Expo Phase 1 terminus at the Venice/Robertson Station in Culver City to Santa Monica.

After various preliminary procedures, including a public "scoping" period during which the Expo Authority received and considered over 1,800 comments from public agencies and individuals concerning the project design and proposed alternatives, the Expo Authority circulated a draft EIR. The draft EIR included six alternatives: a "No-Build" alternative, consisting of the existing transit services plus improvements "explicitly committed to be constructed by the year 2030" as defined in the Southern California Association of Governments (SCAG) Regional Transportation Plan; a "Transportation System Management" alternative, involving the addition of a rapid bus route connecting downtown Culver City with downtown Santa Monica, with associated service improvements on selected routes; and four light rail transit (LRT) alignments, all beginning at the terminus of Expo Phase 1 and ending in downtown Santa Monica near the intersection of 4th Street and Colorado Avenue.

The four LRT alignments were further broken down into segments for purposes of environmental analysis. Segment 1 of two of the LRT alignments included four consecutive at-grade (street level) crossings, where the proposed LRT line crosses Overland Avenue, Westwood Boulevard, Military Avenue, and Sepulveda Boulevard, as well as an at-grade station and a 170-space parking lot within the right-of-way east of Westwood Boulevard. The draft EIR also discussed several alternatives that were rejected by the Expo Authority; none of them included grade-separated crossings in Segment 1.

The Expo Authority received almost 9,000 written and oral comments on the draft EIR. In response to the comments, the Expo Authority undertook more technical and environmental analyses, as well as agency coordination and community outreach. These

additional efforts resulted in changes to the LRT alternatives and new design options that were included in the final EIR.

The changes to the LRT alternatives included a grade-separated (elevated) crossing at Centinela Avenue, a third northbound lane on Sepulveda Boulevard, and the redistribution of parking from the Colorado/4th Street station to nearby City of Santa Monica public parking facilities. The new design options included, among others, a grade-separated (elevated) crossing at Sepulveda Boulevard, elimination of parking at the Expo/Westwood station, and an alternative layout for the maintenance facility that created additional space between the facility and a nearby residential area.

The Expo Authority also further analyzed the Overland Avenue and Westwood Boulevard grade crossings in coordination with the Los Angeles Department of Transportation (LADOT), and confirmed that those crossings would operate safely at grade, with effects mitigated to a less than significant level. (The final EIR described two design options for grade separation (a trench under Overland Avenue and Westwood Boulevard and an aerial structure) at those crossings, but concluded that grade separation at those locations "would not be needed to mitigate significant impacts, and if anything, would generate other environmental impacts," and did not evaluate either of those design options.)

The final EIR, including the changes just described, was circulated on December 21, 2009, identifying LRT Alternative 2 as the preferred alternative for the project. LRT Alternative 2 follows the existing, Metro-owned railroad right-of-way known as the Exposition Corridor right-of-way (part of which runs adjacent to Cheviot Hills) from the Expo Phase 1 terminus in Culver City to the Sepulveda Boulevard intersection. The route continues along the Exposition Corridor right-of-way to its intersection with Olympic Boulevard, and follows the right-of-way to west of 19th Street in Santa Monica, where it diverges onto Colorado Avenue east of 17th Street and continues along the center of Colorado Avenue, terminating between 4th and 5th Streets.

On February 4, 2010, after a public hearing, the Expo Authority certified the final EIR and approved the Expo Phase 2 project, adopting LRT Alternative 2 with

modifications. The Expo Authority adopted detailed findings of fact, a statement of overriding considerations, and a mitigation monitoring and reporting program.

Petitioner sought a writ of mandate invalidating the Expo Authority's certification of the EIR and setting aside the approval of the Expo Phase 2 project. Judgment was entered denying the petition for a writ of mandate on March 4, 2011, and this appeal followed.

The relevant details of the EIR will be set out in the course of our discussion.

## DISCUSSION

We first describe the settled principles guiding our review in CEQA cases, and then address in turn each of the challenges petitioner interposes to the adequacy of the final EIR.

#### 1. CEQA Principles and the Standard of Review

A comprehensive discussion of CEQA and the purposes and role of an EIR appears in *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 390-393 (*Laurel Heights I*). The Legislature intended CEQA to be interpreted to afford the fullest possible protection to the environment within the reasonable scope of the statutory language. (*Laurel Heights I*, at p. 390.) Before approving a project, the lead agency—here, the Expo Authority—must find either that the project's significant environmental effects identified in the EIR have been avoided or mitigated, or that unmitigated effects are outweighed by the project's benefits. (*Id.* at p. 391, citing §§ 21002, 21002.1 & 21081.) The EIR has been described as " the heart of CEQA," an " environmental "alarm bell," " and a "document of accountability." (*Laurel Heights I*, at p. 392.) "If CEQA is scrupulously followed, the public will know the basis on which its responsible officials either approve or reject environmentally significant action, and the public, being duly informed, can respond accordingly to action with which it disagrees." (*Ibid.*)

In an action to set aside an agency's decision under CEQA, the court's inquiry extends only to whether there was a prejudicial abuse of discretion. Abuse of discretion occurs if the agency has not proceeded in a manner required by law, or if its decision is

not supported by substantial evidence. The court passes only upon the EIR's sufficiency as an informative document, not upon the correctness of its environmental conclusions. (*Laurel Heights I, supra*, 47 Cal.3d at p. 392.) CEQA Guidelines, which implement the provisions of CEQA, define "substantial evidence" as "enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached." (Guidelines, § 15384, subd. (a).)<sup>3</sup>

Laurel Heights I cautions that a court may not set aside an agency's approval of an EIR on the ground that an opposite conclusion would have been equally or more reasonable. (Laurel Heights I, supra, 47 Cal.3d at p. 393.) CEQA's purpose is to compel government to make decisions with environmental consequences in mind, but CEQA " 'does not, indeed cannot, guarantee that these decisions will always be those which favor environmental considerations.' " (Laurel Heights I, at p. 393.) Technical perfection in an EIR " ' "is not required; the courts have looked not for an exhaustive analysis but for adequacy, completeness and a good-faith effort at full disclosure." '" (California Native Plant Society v. City of Santa Cruz (2009) 177 Cal.App.4th 957, 979.)

The appellate court's inquiry is the same as that of the trial court. The appellate court reviews the administrative record independently to determine whether the Expo Authority complied with CEQA or made determinations that were not supported by substantial evidence. (*Planning & Conservation League v. Department of Water Resources* (2000) 83 Cal.App.4th 892, 912; see also § 21168.) "The burden of showing that the EIR is inadequate is on the party challenging the EIR." (*Pfeiffer v. City of Sunnyvale City Council* (2011) 200 Cal.App.4th 1552, 1562 (*Pfeiffer*).)

<sup>&</sup>lt;sup>3</sup> All references to "Guidelines" are to the current CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq.). Courts "should afford great weight to the Guidelines except when a provision is clearly unauthorized or erroneous under CEQA." (*Laurel Heights I, supra*, 47 Cal.3d at p. 391, fn. 2.)

# 2. The Baseline for Analysis of Traffic, Air Quality and Greenhouse Gas Issues

An EIR uses an environmental baseline to analyze the impacts of a project. The Expo Authority found the population and traffic levels that were current in 2009 did not provide a reasonable baseline for determining the significance of traffic and air quality impacts of the project and, instead, used future, 2030 baseline conditions to make that determination. Petitioner contends that, as a matter of law, projected future conditions cannot provide the baseline for reviewing the significance of environmental impacts. We disagree.

Before we address petitioner's contention in the context of this case, we summarize the law on the point as it has developed so far.

## a. The law

CEQA itself does not refer to a baseline, but CEQA Guidelines tell us the following: "An EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective. *This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant*." (Guidelines, § 15125, subd. (a), italics and boldface added.)<sup>4</sup>

As the Supreme Court has observed, "A long line of Court of Appeal decisions holds, in similar terms, that the impacts of a proposed project are ordinarily to be compared to the actual environmental conditions existing at the time of CEQA analysis,

<sup>&</sup>lt;sup>4</sup> See also Guidelines, section 15126.2, subdivision (a): "An EIR shall identify and focus on the significant environmental effects of the proposed project. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced."

rather than to allowable conditions defined by a plan or regulatory framework." (Communities for a Better Environment v. South Coast Air Quality Management Dist. (2010) 48 Cal.4th 310, 320-321 (CBE).) "This line of authority includes cases where a plan or regulation allowed for greater development or more intense activity than had so far actually occurred, as well as cases where actual development or activity had, by the time CEQA analysis was begun, already exceeded that allowed under the existing regulations. In each of these decisions, the appellate court concluded the baseline for CEQA analysis must be the 'existing physical conditions in the affected area' [citation], that is, the '"real conditions on the ground" '[citations], rather than the level of development or activity that could or should have been present according to a plan or regulation." (Id. at p. 321, fns. omitted.)

*CBE* involved modifications at a petroleum refinery where the operation of four boilers (the existing steam generation equipment) was restricted by permits stating a maximum rate of heat production. To evaluate changes in nitrogen oxide (NOx) emissions that would be caused by the proposed modifications, the agency used as a baseline the maximum emissions allowed under the current permits, that is, all four boilers running at maximum capacity simultaneously, even though such simultaneous operation was not the norm. In ordinary operation, a boiler would run at maximum allowed capacity only when one or more of the other boilers were shut down for maintenance. (*CBE*, supra, 48 Cal.4th at p. 322.)

The court concluded the agency's baseline—simultaneous maximum operation was "not a realistic description of the existing conditions without the [project]. . . . By comparing the proposed project to what *could* happen, rather than to what was actually happening, the District set the baseline not according to 'established levels of a particular use,' but by 'merely hypothetical conditions allowable' under the permits." (*CBE*, *supra*, 48 Cal.4th at p. 322.) This approach, using "hypothetical allowable conditions as the baseline," provided "an illusory basis for a finding of no significant adverse effect despite an acknowledged increase in NOx emissions exceeding the District's published significance threshold." (*Ibid*.) This use of maximum capacity levels rather than actually

existing levels of emissions from the boilers, as a baseline to analyze emissions from the project, was "inconsistent with CEQA and the CEQA Guidelines." (*Id.* at pp. 326-327.)

*CBE* also observed: "Neither CEQA nor the CEQA Guidelines mandates a uniform, inflexible rule for determination of the existing conditions baseline. Rather, an agency enjoys the discretion to decide, in the first instance, exactly how the existing physical conditions without the project can most realistically be measured, subject to review, as with all CEQA factual determinations, for support by substantial evidence." (*CBE*, supra, 48 Cal.4th at p. 328.)<sup>5</sup>

Since *CBE*, two Courts of Appeal have held it was improper to use predicted conditions on a date after EIR certification or project approval as the baseline for assessing environmental consequences. In *Sunnyvale*, the Sixth District found that projected 2020 conditions provided an improper baseline for determining traffic and related impacts of a roadway extension project. (*Sunnyvale, supra*, 190 Cal.App.4th at p. 1383.) In *Madera*, a case involving the development of 1,579 acres for residential,

"But, as one appellate court observed, 'the date for establishing baseline cannot be a rigid one. Environmental conditions may vary from year to year and in some cases it is necessary to consider conditions over a range of time periods.' [Citation.] In some circumstances, peak impacts or recurring periods of resource scarcity may be as important environmentally as average conditions. Where environmental conditions are expected to change quickly during the period of environmental review for reasons other than the proposed project, project effects might reasonably be compared to predicted conditions at the expected date of approval, rather than to conditions at the time analysis is begun. [Citation.] A temporary lull or spike in operations that happens to occur at the time environmental review for a new project begins should not depress or elevate the baseline; overreliance on short-term activity averages might encourage companies to temporarily increase operations artificially, simply in order to establish a higher baseline." (*CBE*, supra, 48 Cal.4th at pp. 327-328.)

<sup>5</sup> The court again quoted the Guidelines (§ 15125, subd. (a)) directing that the lead agency "normally" use a measure of physical conditions at the time a notice of preparation is published or when the environmental analysis is commenced. (*CBE*, *supra*, 48 Cal.4th at p. 327.) The court continued:

commercial and light industrial uses, the Fifth District followed *Sunnyvale*, concluding the EIR failed to clearly identify the baseline being used to quantify the project's impacts on traffic, and holding that "a baseline . . . must reflect existing physical conditions" and "lead agencies do not have the discretion to adopt a baseline that uses conditions predicted to occur on a date subsequent to the certification of the EIR." (*Madera, supra,* 199 Cal.App.4th at pp. 89-90, 92, 96.)

In still another case, involving a proposal to expand a medical campus in the City of Sunnyvale, the Sixth District rejected a claim the EIR used a legally incorrect traffic baseline for determining the project's traffic impacts. (*Pfeiffer, supra*, 200 Cal.App.4th at p. 1557.) In *Pfeiffer*, the EIR used multiple traffic baselines to analyze traffic impacts: existing conditions, background conditions (existing traffic volumes multiplied by a growth factor plus traffic from approved but not yet constructed developments), project conditions and cumulative conditions. (Id. at pp. 1560, 1571.) The court rejected the claim that use of background "predicted" conditions was improper and that the baseline should be limited to existing conditions. (Id. at p. 1572.) The court observed: "[A]ppellants' contention that a traffic baseline is limited to existing conditions lacks merit because . . . the California Supreme Court has instructed that predicted conditions may serve as an adequate baseline where environmental conditions vary. . . . ([CBE], supra, 48 Cal.4th at pp. 327-328.) Here, there was substantial evidence, undisputed by appellants, that traffic conditions in the vicinity of the . . . project could vary from existing conditions due to a forecast for traffic growth and the construction of alreadyapproved developments. Moreover, appellants overlook the fact that the EIR included existing conditions, based on actual traffic counts, in its analysis of traffic impacts." (*Pfeiffer*, at p. 1572.)

*Pfeiffer* distinguished *Sunnyvale* because in *Sunnyvale*, the traffic baselines included only projected traffic conditions in 2020, while in *Pfeiffer* the baselines also "included existing conditions and the traffic growth anticipated from approved but not yet constructed developments." (*Pfeiffer*, *supra*, 200 Cal.App.4th at p. 1573.) In addition, *Sunnyvale* had acknowledged that discussions of expected future conditions may be

necessary to an intelligent understanding of a project's impacts over time. (*Pfeiffer*, at p. 1573; *Sunnyvale*, *supra*, 190 Cal.App.4th at p. 1381.)

#### b. This case

In this case, the Expo Authority described the existing physical environmental conditions in the EIR and acknowledged that, under CEQA Guidelines, those conditions would normally constitute the appropriate baseline physical conditions for determining whether an impact is significant. For most environmental topics, the Expo Authority found existing conditions to be the appropriate baseline—but not for traffic and air quality impacts. Instead, the Expo Authority "elect[ed] to utilize the future baseline conditions for the purposes of determining the significance of impacts to traffic and air quality," finding that "the existing physical environmental conditions (current population and traffic levels) do not provide a reasonable baseline for the purpose of determining whether traffic and air quality impacts of the Project are significant."

Thus, the Expo Authority defined the "No-Build" alternative as consisting of existing transit services and "improvements explicitly committed to be constructed by the year 2030" as defined in the 2008 SCAG Regional Transportation Plan,<sup>6</sup> and evaluated projected future traffic and air quality conditions with and without the project. SCAG identified the project as a necessary component of the regional transportation system in Southern California, and the Expo Authority relied on various SCAG projections for 2030, which it identified as the project's planning horizon. The Expo Authority "adopted official demographic and [*sic*] projections for the project area and region" and further explained: "Past experience with the adopted demographic projections indicate[s] that it is reasonable to assume that the population of the project area and the region will continue to increase over the life of the project. The projected population increases will,

<sup>&</sup>lt;sup>6</sup> The Expo Authority's findings of fact further explain that the No-Build alternative "includes only transit service and roadway construction projects that are programmed and funded and would be expected to occur, independent of and regardless of whether one of the proposed Transportation Systems Management . . . or LRT Alternatives is approved."

in turn, result in increased traffic congestion and increased air emissions from mobile sources in the project area and in the region." The Expo Authority found it was necessary to evaluate future projected traffic and air quality conditions with and without the project "so that the public and the decision makers may understand the future impacts on traffic and air quality of approving and not approving the project." So, for example, in traffic studies analyzing the impact of the project on intersection delay, the EIR assessed project impacts "under 'future' conditions," evaluating "the impacts of the project alternatives against projected future traffic conditions in the year 2030," identifying impacts both with and without the project.

Petitioner objects to the Expo Authority's approach, contending, based on *Sunnyvale* and *Madera*, that it fails to comply with CEQA by using "hypothetical 'future' conditions as the baseline for analyzing impacts on traffic, air quality, and climate change . . . ." Further, petitioner objects that use of the No-Build conditions as the environmental baseline was improper because the No-Build conditions represent a future, hypothetical scenario that assumes the completion of various regional transportation improvements. Petitioner objects, for example, that the "threshold for assessing the Project's potential impacts on the operation of selected street intersections was whether the Project would cause an intersection's level of service ('LOS') 'under the No-Build [alternative]' to deteriorate from an acceptable LOS to an unacceptable LOS . . . []' by 2030." Petitioner argues that the use of existing conditions at the intersections as the baseline "would have likely revealed additional and/or more severe traffic impacts" than were identified with the use of 2030 as the baseline. Petitioner makes similar objections with respect to the EIR's analysis of air quality and greenhouse gases.

We agree with the Expo Authority and amici curiae that, in a proper case, and when supported by substantial evidence, use of projected conditions may be an appropriate way to measure the environmental impacts that a project will have on traffic,

air quality and greenhouse gas emissions.<sup>7</sup> As a major transportation infrastructure project that will not even begin to operate until 2015 at the earliest, its impact on *presently existing* traffic and air quality conditions will yield no practical information to decision makers or the public. An analysis of the environmental impact of the project on conditions existing in 2009, when the final EIR was issued (or at any time from 2007 to 2010), would only enable decision makers and the public to consider the impact of the rail line *if it were here today*. Many people who live in neighborhoods near the proposed light rail line may wish things would stay the same, but no one can stop change. The traffic and air quality conditions of 2009 will no longer exist (with or without the project) when the project is expected to come on line in 2015 or over the course of the 20-year planning horizon for the project. An analysis of the project's impacts on anachronistic 2009 traffic and air quality conditions would rest on the false hypothesis that everything will be the same 20 years later.

Consequently, we reject the notion that CEQA forbids, as a matter of law, use of projected conditions as a baseline. Nothing in the statute, the CEQA Guidelines, or *CBE* requires that conclusion. To the extent *Sunnyvale* and *Madera* purport to eliminate a lead

<sup>7</sup> The Expo Authority also argues that petitioner did not exhaust its administrative remedies on the baseline issue in the proceedings below, pointing out that in fact petitioner criticized the Expo Authority for not using a 2035 baseline. (Petitioner asserted in a letter to the Expo Authority that the "traffic study and corresponding air quality analysis should be based upon a 20-year planning horizon for environmental analysis," and "the environmental analysis should be based upon modeling that forecasts out to the project design year of 2035, not 2030," because "[o]therwise, the environmental analysis is only based upon a 15-year window with a base year [2005] that occurs 9 years before the project is projected to be implemented [2014].") Another commenter, however, did raise the issue, asserting that the draft EIR "understates the impact of the Project's traffic," measuring the impact "by comparing the change in intersection performance between the No-Build alternative and LRT alternative in 2030," but nowhere evaluating "the impact between the Project-added traffic to existing conditions." While petitioner did not raise the issue, we think the quoted comment was sufficiently specific to preserve the claim for appeal. (See Sierra Club v. City of Orange (2008) 163 Cal.App.4th 523, 536.)

agency's discretion to adopt a baseline that uses projected future conditions under any circumstances, we disagree with those cases.

Recognizing that we are bound to follow the Supreme Court's teaching in *CBE*, we find *CBE* does not resolve this case. *CBE* rejected the use of "hypothetical allowable conditions" when those conditions were "not a realistic description of the existing conditions" without the project, as that would be an "illusory basis" for a finding of no significant impact from the project. (*CBE*, supra, 48 Cal.4th at p. 322.) But present-day "hypothetical allowable" conditions are quite different from projected future conditions. And the timeline for building a major new transportation project is likewise different from the timeline to modify already-operating steam generation equipment. It is "illusory" to assume something is happening (and use it for a baseline) when it is not happening and never has, such as with the NOx emissions in *CBE*. But there is nothing "illusory" about population growth and its inevitable impacts on traffic and air quality: population *is* growing, and population increases *do* affect traffic and air quality, with or without the project. A decision to measure environmental effects of a long-term project by looking at those effects in the long term is neither hypothetical nor illusory. It is a realistic and rational decision.

*CBE* is not to the contrary. The choices in *CBE both* involved measuring the project's effects against "existing" conditions: the existing *allowable* emissions versus the existing *actual* emissions. The court insisted on a *realistic* description of existing conditions, and that meant actual, not hypothetical, existing conditions. Here, by contrast, existing conditions—population and traffic levels—are not static, and are not in any sense a "realistic" baseline from which to measure the traffic and air quality impacts of a long-term rail infrastructure project. On the contrary, using a 20-year planning horizon, based on reasonable demographic projections, to measure those impacts is, it seems to us, eminently realistic.

We turn now to *Sunnyvale* and *Madera*, cases that petitioner contends require the measurement of environmental impacts against presently existing conditions under any
and all circumstances.<sup>8</sup> Sunnyvale involved a roadway extension project. The EIR used projected traffic conditions in the year 2020, "based on expected growth under the City of Sunnyvale's general plan and in neighboring communities, as its 'baseline' to evaluate the roadway project's traffic and related impacts," and "did not consider the project's traffic and related impacts," and "did not consider the project's traffic and related impacts," and "did not consider the project's traffic and related impacts on the existing environment." (Sunnyvale, supra, 190 Cal.App.4th at p. 1358.) The court concluded this was "a failure to proceed in the manner required by law." (Id. at p. 1383.)

Sunnyvale emphasized case law indicating that an EIR " 'must focus on impacts to the existing environment, not hypothetical situations.' " (Sunnyvale, supra, 190 Cal.App.4th at p. 1373.) And the court cited CBE's conclusion that the lead agency in that case was required to "compare 'existing physical conditions' without the project to the conditions expected to be produced by the project because '[w]ithout such a comparison, the EIR will not inform decision makers and the public of the project's significant environmental impacts, as CEQA mandates. (§ 21100).'" (Sunnyvale, at p. 1375, quoting CBE, supra, 48 Cal.4th at p. 328.) Sunnyvale pointed out that in CBE the Supreme Court "never sanctioned the use of predicted conditions on a date subsequent to EIR certification or project approval as the 'baseline' for assessing a project's environment consequences." (Sunnyvale, at p. 1375.) But neither did the Supreme Court forbid the use of projected future conditions; the point was simply not at issue.

In the end, *Sunnyvale* holds that "[t]he statute [CEQA] *requires* the impact of *any* proposed project to be evaluated against a baseline of existing environmental conditions

<sup>&</sup>lt;sup>8</sup> The League of California Cities, the California State Association of Counties, the City of Los Angeles, SCAG, and some 11 other regional transportation and water agencies have joined in briefs supporting the use of projected future conditions and asking this court to reject the *Sunnyvale* approach. They contend that use of a future-conditions baseline is essential for long-range transportation and water supply projects, in order to isolate project-generated environmental effects from ambient effects that would occur in any event. It is the *Sunnyvale* approach, they say, that would study hypothetical conditions: "the project is constructed *today* and conditions remained *unchanged* over the next 20 to 30 years."

(see §§ 21060.5, 21100, subd. (d), 21151, subd. (b); see also CEQA Guidelines, § 15125, subd. (a)), which is the *only* way to identify the environmental effects specific to the project alone." (*Sunnyvale, supra*, 190 Cal.App.4th at p. 1380, italics added.) But none of the statutory provisions or Guidelines cited "requires" that conclusion. Moreover, *Sunnyvale* cites no authority for its own conclusion that use of a baseline of current conditions "is the only way" to identify impacts "specific to the project alone" (*Sunnyvale*, at p. 1380)—and we find that conclusion is erroneous when applied to traffic and air quality impacts of a long-term infrastructure project, the very purpose of which is to improve traffic and air quality conditions over time.

We construe the Guidelines to permit analysis of environmental impacts using a baseline other than the environmental setting as it exists when the notice of preparation of an EIR is published or when environmental analysis is begun. The Guidelines state that publication of the notice of preparation of an EIR or the beginning of environmental analysis "will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant." (Guidelines, § 15125, subd. (a), italics added.) To state the norm is to recognize the possibility of departure from the norm. We see no rational basis for Sunnyvale's constricted view of the word "normally." Sunnyvale construed the term as allowing discretion to change the baseline from the times identified in the regulation to an earlier date (e.g., if current conditions temporarily deviate from the usual historic conditions) or to a later date (e.g., if "traffic levels are expected to increase significantly during the environmental review process due to other development actually occurring in the area"), but not to any date later than the date of project approval. (Sunnyvale, supra, 190 Cal.App.4th at p. 1380.) We do not agree these are the only appropriate scenarios for using a baseline other than present-day conditions irrespective of the nature of the project under analysis.

If "projected traffic levels as of the expected date of project approval" (*Sunnyvale*, *supra*, 190 Cal.App.4th at p. 1380) may be an appropriate baseline, then projected traffic levels as of the expected date the project will come on line, or some later date in the planning horizon, may also be appropriate. The important point, in our view, is the

reliability of the projections and the inevitability of the changes on which those projections are based. The objective is to provide information that is relevant and permits informed decisionmaking. Nothing in the use of a baseline of future projected conditions, not "hypothetical allowable" conditions, has been shown to be inconsistent with the provisions of CEQA or with its purpose. Accordingly, we reject *Sunnyvale*'s conclusion that, as a matter of law, CEQA requires, for "any proposed project," that the significance of its impact on the environment be measured against a baseline of conditions existing, at the latest, at the time the project is approved. (*Sunnyvale*, at p. 1380.) Neither the language nor the purpose of the statute and the Guidelines requires that conclusion in every case.

Petitioner also relies on Madera, a case involving a mixed-use development project and whether a proper baseline was used to analyze the project's traffic impacts. In that case, the Fifth District followed Sunnyvale, finding its analysis "persuasive" and declining to "set forth a redundant analysis here." (Madera, supra, 199 Cal.App.4th at p. 89.) In Madera, the lead agency asserted that two baselines were used and existing conditions were the primary baseline (id. at pp. 92-93), but the Court of Appeal was "unable to state with certainty that existing conditions were used as the baseline ...." (Id. at p. 95.) Based on Sunnyvale, Madera adopted the legal conclusions that "[a] baseline used in an EIR must reflect existing physical conditions," and lead agencies "do not have the discretion to adopt a baseline that uses conditions predicted to occur on a date subsequent to the certification of the EIR" (although lead agencies "do have the discretion to select a period or point in time for determining existing physical conditions other than the two points specified in subdivision (a) of Guidelines section 15125, so long as the period or point selected predates the certification of the EIR"). (Madera, at pp. 89-90.) Madera adds nothing to the Sunnyvale analysis, with which we are in fundamental disagreement.

To summarize: We agree with the Expo Authority that there is a "profound difference" between projected conditions supported by substantial evidence and the "hypothetical" or "illusory" conditions discussed in the cases. Population growth, with

its concomitant effects on traffic and air quality, is not hypothetical in Los Angeles County; it is inevitable. Neither *CBE* nor CEQA forbids the use of a future baseline, and an agency's use of discretion in selecting a baseline is expressly reserved in the Guidelines by the use of the word "normally." In a major infrastructure project such as Expo Phase 2, assessment of the significance of environmental effects based on 2009 conditions (or conditions at any point from 2007 to 2010) yields no practical information, and does nothing to promote CEQA's purpose of informed decisionmaking on a project designed to serve a future population. We therefore hold that an agency's use of a projected future baseline, when supported by substantial evidence, is an appropriate means to analyze the traffic and air quality effects of a long-term infrastructure project.<sup>9</sup>

Before we leave this subject, we note that respondents devote a considerable part of their briefs to showing that substantial evidence supports the methodologies and projections used by the Expo Authority to determine the significance of traffic and air quality impacts in this case. We need not dwell on this point at any length, because petitioner does not suggest that the methodologies, forecasts, models, and other data are insufficient to support the projections the Expo Authority has used—but rather only that the Expo Authority should not be permitted to use them. Petitioner has made no effort to demonstrate how the use of projected traffic and air quality conditions as a baseline to measure the impact of this project has precluded or could preclude informed decisionmaking (or, conversely, how the use of current conditions to measure those impacts would or could contribute to informed decisionmaking). In our review of the record, we found the Expo Authority's use of 2030 projections is supported by both

<sup>&</sup>lt;sup>9</sup> Petitioner also complains that the Expo Authority "elected to use 2030 as the baseline for the [final EIR's] traffic analysis, although operation of the system is expected to begin in 2015," and this "ignores the Project's first fifteen years of impacts." But petitioner did not raise this claim in the administrative proceedings (and does not identify any other commenter who did). In any event, because we find that use of a future baseline is permissible for a major infrastructure project, the decision on whether to use the opening year or a later year within the planning horizon is within the agency's discretion. Petitioner has shown no abuse of that discretion.

substantial evidence and common sense, and is entirely consonant with the EIR's purpose as an informational document. It is only when an EIR "fails to include relevant information and precludes informed decisionmaking and public participation" that a prejudicial abuse of discretion occurs. (See *Save Our Peninsula Committee v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 128.) That is not this case.

#### 3. The EIR's Analysis of Traffic Impacts

Petitioner contends the EIR's traffic analysis was inadequate because it failed to address potential traffic impacts on Sepulveda Boulevard, which serves as a de facto alternative route for the I-405 when traffic is bad on the freeway. Petitioner points out that, in response to the draft EIR, the LADOT commented on the at-grade rail crossing at Sepulveda Boulevard, stating that "[i]t must be recognized that Sepulveda Boulevard serves as an alternate route to the Interstate 405 Freeway when incidents occur and the traffic volumes used for analysis do not consider these occurrences."

After the comments were received, however, additional studies and discussions with LADOT occurred, and the at-grade crossing at Sepulveda Boulevard was reconsidered and re-analyzed. California Public Utilities Commission standards and other environmental factors were also taken into consideration, and both at-grade improvements and grade-separation options were discussed. Thus, "as a result of the additional analysis and coordination with LADOT," the final EIR added a third northbound lane on Sepulveda Boulevard between the LRT crossing and Pico Boulevard. In addition, the Expo Authority included an aerial station and grade separation at Sepulveda Boulevard as a design option in the final EIR, "which could be constructed subject to the provision of additional funding by others."

These actions were consistent with the contents of an October 15, 2009 letter from the LADOT summarizing the measures proposed by the Expo Authority concerning grade crossings, including at Sepulveda Boulevard. After concluding that the level of service was acceptable to LADOT, the LADOT concluded: "The queue lengths and delay cited above reflect normal conditions. We note that Sepulveda Boulevard sometimes serves as a *de facto* alternate route for Interstate 405 during freeway incidents.

When this occurs, motorists divert to Sepulveda Boulevard and traffic demand increases dramatically. Accordingly, we encourage consideration of the Design Option and believe that an aerial grade separation at Sepulveda Boulevard would be a better long-term measure than at-grade operation."

In short, the changes rendered the at-grade crossing acceptable to LADOT, although it preferred an aerial grade separation as a long-term measure. Moreover, after the judgment was entered below, the Expo Authority's Board, at a special meeting held on March 18, 2011, adopted a resolution in which it "selected and adopted" the Sepulveda grade-separation design option. (This court granted the Expo Authority's request for judicial notice of the Board's resolution.) Consequently, petitioner's claim the final EIR did not contain a "sufficient degree of analysis" of the traffic impacts on Sepulveda Boulevard "during freeway incidents," assuming it had any merit, has been effectively eliminated.

In its reply brief, petitioner says that providing the grade separation at Sepulveda, but not at Overland, Westwood or Military, "will merely attract more vehicles toward Sepulveda Boulevard" and "may actually exacerbate the traffic impacts resulting from the diversion of traffic during incidents on I-405." This is speculation, unsupported by any citation to the record, and is insufficient to meet petitioner's burden to demonstrate any inadequacy in the final EIR.

### 4. Growth-inducing Impacts

Petitioner's next claim is that the EIR's analysis of growth-inducing impacts of the project was inadequate.

CEQA Guidelines require an EIR to discuss "the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment." (Guidelines, § 15126.2, subd. (d).) The Guidelines explain:

"Included in this are projects which would remove obstacles to population growth (a major expansion of a waste water treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment." (Guidelines, § 15126.2, subd. (d).)

Thus, for example, a transportation project in an isolated or undeveloped area may be considered growth-inducing.

The EIR ultimately concluded that the Expo Phase 2 project would not result in growth-inducing impacts. The EIR explained:

"The Expo Phase 2 project would be built within a well-developed urban area, where only in-fill development opportunities remain. The project would be located in an area that is already well served by an existing network of electricity, water, sewer, storm drain, and other infrastructure that accommodates existing and planned growth.

"The project would not provide new accessibility but would enhance accessibility by transit, thereby reducing private automobile use. The need for a high-capacity, major transit investment in the Expo Phase 2 community is driven by significant population and employment concentrations, along with continued growth trends in the greater area. The project would accommodate and serve residents and visitors to the project cities and would provide an increased level of public transit service that is consistent with local and regional growth projections and land use/transportation policies. The project also is consistent with local and regional planning to accommodate anticipated corridor growth by reducing VMT [vehicle miles traveled] and other impacts attendant on private automobile use. In fact, the proposed project is the culmination of a planning process that has been underway for over 30 years .... Given that the Exposition transit corridor area is a planned and desired land use as reflected in local and regional plans, it would be compatible with the study area's general land use characteristics and would serve to link activity centers within the area. Notably, the intensification of land uses around transit station areas with mixed uses and higher densities reflects an embracement of 'smart growth' principles-that projected growth should be focused or directed towards areas with available infrastructure and supportive of reduced vehicle miles traveled, fewer air emissions, and reduced energy consumption. Under smart growth principles, this growth that is projected to occur anyway is directed through general plan,

community plan, and specific plan amendments, and rezonings towards station areas." (Boldface & italics added.)

Petitioner points out that the EIR stated the project "could result in community investment and the development of Transit Oriented Development (TOD) around station areas," and contends that by "failing to discuss the potential impacts of concentrating new development around the planned stations," the EIR's discussion of growth-inducing impacts is "fatally incomplete." Further, the EIR (in its assessment of cumulative impacts) lists past, present, and reasonably foreseeable future projects, and these include a mixed-use construction project (the Casden project) adjacent to the proposed Sepulveda transit station. Thus, petitioner claims, the EIR should have discussed "the potential localized impacts" of the intensification of land uses around transit station areas, such as "traffic, parking, aesthetics, noise, light and glare, etc."

Petitioner ignores the law on the point. "An EIR must analyze the growthinducing impact of a project, including reasonably foreseeable consequences but not speculative effects." (*Federation of Hillside & Canyon Associations v. City of Los Angeles* (2000) 83 Cal.App.4th 1252, 1265 (*Federation*); see also *Napa Citizens for Honest Government v. Napa County Bd. of Supervisors* (2001) 91 Cal.App.4th 342, 368-369 (*Napa Citizens*) [an EIR is not required "to make a detailed analysis of the impacts of a project on housing and growth"; "Nothing in the Guidelines, or in the cases, requires more than a general analysis of projected growth."].) "The detail required in any particular case necessarily depends on a multitude of factors, including, but not limited to, the nature of the project, the directness or indirectness of the contemplated impact and the ability to forecast the actual effects the project will have on the physical environment. In addition, it is relevant, although by no means determinative, that future effects will themselves require analysis under CEQA." (*Napa Citizens*, at p. 369.)

The EIR's discussion of growth-inducing impacts (and its conclusion there were none, as the project accommodated projected growth and travel demand rather than inducing it) satisfied the CEQA guideline. First, the purpose and nature of the Expo Phase 2 project "was not to facilitate additional development after the project is completed" (*Clover Valley Foundation v. City of Rocklin* (2011) 197 Cal.App.4th 200, 227) or to remove an obstacle to growth. (Guidelines, § 15126.2, subd. (d).) As the EIR notes, the growth in question "is projected to occur anyway" and is "directed through general plan, community plan, and specific plan amendments, and rezonings towards station areas." And, "any future effects of that additional development will undergo CEQA analysis." (*Clover Valley*, at p. 228; see also *Napa Citizens*, *supra*, 91 Cal.App.4th at p. 369.)

Second, nothing in the Guidelines requires the detail petitioner suggestsdiscussion of "potential localized impacts" such as "traffic, parking, aesthetics, noise, light and glare" from a project (the Casden project) which was not even under environmental review until several months after the draft EIR for the Expo Phase 2 project was circulated. (Cf. San Franciscans for Reasonable Growth v. City and County of San Francisco (1984) 151 Cal.App.3d 61, 74, 75 (San Franciscans) [for purposes of cumulative impact analysis, an EIR must consider "other closely related projects that were currently under environmental review," as these are " '[reasonably] foreseeable probable future projects' "]; see also § 21002.1, subd. (e) ["lead agencies shall, in accordance with Section 21100, focus the discussion in the environmental impact report on those potential effects on the environment of a proposed project which the lead agency has determined are or may be significant. Lead agencies may limit discussion on other effects to a brief explanation as to why those effects are not potentially significant."]; § 21100, subd. (c) [the EIR "shall also contain a statement briefly indicating the reasons for determining that various effects on the environment of a project are not significant and consequently have not been discussed in detail in the environmental impact report"].)10

<sup>&</sup>lt;sup>10</sup> Petitioner cites Bakersfield Citizens for Local Control v. City of Bakersfield (2004) 124 Cal.App.4th 1184, 1218 (Bakersfield) and San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus (1994) 27 Cal.App.4th 713, 732-733 (San Joaquin), but neither case is relevant to petitioner's contention. Bakersfield held that EIR's for two shopping center projects—neither of which considered the other, despite overlapping

In short, petitioner has failed to meet its burden of demonstrating any error in the EIR's analysis of growth-inducing impacts.

# 5. Cumulative Traffic Impacts

CEQA Guidelines require an EIR to discuss cumulative impacts of a project "when the project's incremental effect is cumulatively considerable, as defined in section 15065(a)(3)." (Guidelines, § 15130, subd. (a).) " 'Cumulatively considerable' means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." (*Id.*, § 15065, subd. (a)(3).) A cumulative impact "is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts." (*Id.*, § 15130, subd. (a)(1).)

The CEQA Guidelines say that several elements are necessary to an adequate discussion of significant cumulative impacts. As relevant here, these include:

1. *Either* a "list of past, present, and probable future projects producing related or cumulative impacts," *or* a "summary of projections contained in an adopted local, regional or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect" (Guidelines, § 15130, subd. (b)(1));

2. "A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available" (Guidelines, § 15130, subd. (b)(4)); and

3. "A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable, feasible options for mitigating

market areas and shared roadways—were legally inadequate because of "underinclusive and misleading cumulative impacts analysis." (*Bakersfield*, at pp. 1216-1217.) In *San Joaquin*, sewer expansion (for which a separate EIR had been certified) was recognized in the draft EIR for a development project as necessary to the project, "yet was excluded from the description of the development project and its effects ignored" in the final EIR. (*San Joaquin*, at pp. 729-730, 732.) Both cases involved two projects, both of which were undergoing environmental review. or avoiding the project's contribution to any significant cumulative effects." (Guidelines, § 15130, subd. (b)(5).)

The Guidelines specifically state that previously approved land use documents, "including, but not limited to, general plans, specific plans, [and] regional transportation plans . . . may be used in cumulative impact analysis." (Guidelines, § 15130, subd. (d).)

The EIR in this case identified the two alternatives permitted by the CEQA Guidelines for discussion of cumulative impacts (the "list of projects" approach and the "summary of projections" approach), and indicated that: "For purposes of this project, a 'blended' cumulative impacts analysis has been conducted based on a summary of projections from SCAG's 2008 RTP [Regional Transportation Plan], Metro's 2009 Long Range Transportation Plan, and the Culver City, Los Angeles and Santa Monica General Plans, together with funded and unfunded improvement projects from the 2008 RTP and Metro's 2009 Long-Range Transportation Plan. In addition, a list of recently proposed or planned projects was evaluated for potential cumulative effects."

With respect to cumulative traffic impacts, the EIR contains no separate analysis, instead referring the reader to the analysis provided in the EIR's discussion of transportation and traffic impacts of the project itself, explaining that the latter analysis was "based upon both existing and future conditions, with and without the project."

Petitioner contends the EIR's analysis of cumulative traffic impacts was inadequate because it failed "to consider the *localized* traffic impacts of related projects and other deficiencies." No "other deficiencies" are identified. Petitioner asserts the EIR does not meet the second and third of the three requirements listed above—that it does not "provide a summary of the expected environmental effects to be produced by the related projects . . . and fails to meaningfully analyze the Project's potential cumulative impacts." Petitioner complains that the EIR "ignores known, related projects that will have direct, localized, cumulative impacts that are not captured by the 'summary of projections,' thereby failing to comply" with the CEQA Guidelines.

Petitioner identifies only one specific deficiency. Petitioner cites the Casden Project—which is identified in the EIR as proposing 265,000 square feet of retail floor space and 500 residential units, but for which no applications had been filed when the draft EIR was circulated. Petitioner complains that the EIR "made no attempt to actually quantify the traffic generated by the Casden Project or even discuss the potential cumulative traffic impacts" at the highly congested intersection of Pico and Sepulveda Boulevards and, instead, "merely relied on regional traffic volumes and adjusted for assumed trip reduction based on transit ridership, station-area parking and drop-off/pick-up, and trip diversions."<sup>11</sup>

We see no inadequacy in the Expo Authority's approach. The Expo Authority identified the Casden Project along with many others in its "List of Recent Projects Included in the Cumulative Assessment." But no application had been made for that project when the notice of preparation of the Expo Phase 2 project was filed in February 2007, or when the draft EIR was issued in January 2009. On that basis alone, the Expo Authority arguably was not required to consider the Casden Project.

In *San Franciscans*, *supra*, 151 Cal.App.3d at pages 74-75, the court held that " 'foreseeable probable future projects' " included projects "currently under environmental review," and found CEQA was violated when a cumulative impacts

<sup>11</sup> Respondents assert that we need not consider petitioner's contention, because the claimed failure to analyze adequately the "localized" cumulative traffic impacts at the intersection of Sepulveda and Pico Boulevards was never brought to the Expo Authority's attention during the administrative proceedings. (See § 21177, subd. (a), & fn. 7, ante, at p. 15.) It is true that, while petitioner raised many alleged inadequacies in the cumulative impact analysis during the proceedings below, the failure to analyze the impact of the Casden Project on the Sepulveda/Pico intersection was not one of them. But another commenter stated that the draft EIR "fails to mention the impacts of the proposed Casden Project on Sepulveda Boulevard and Pico Boulevard. The construction of this project and Expo Phase 2 will cause a combined negative impact upon the neighborhood surrounding the right-of-way. The impact of the Casden Project must be studied." Still another commenter stated that "The [draft] EIR fails to evaluate known related projects. Specifically, it fails to evaluate interactions with [among a half dozen other items] the Casden project at Exposition/Sepulveda .... [¶] This failure renders the [draft] EIR inaccurate and useless as an environmental document." Again, we think the other comments were sufficiently specific to preserve the claim for appeal. (See Sierra Club v. City of Orange, supra, 163 Cal.App.4th at p. 536.)

analysis is based only on approved projects and projects under construction. (San Franciscans, at p. 72.) (While it did not discuss the point, the court apparently rejected the contention that "projects formally announced by developer also should have been considered." (Id. at p. 74.)) Petitioner relies on Gray v. County of Madera (2008) 167 Cal.App.4th 1099, 1127-1128 (Gray), where the court said that "any future project where the applicant has devoted significant time and financial resources to prepare for any regulatory review should be considered as probable future projects for the purposes of cumulative impact." (Ibid.) But petitioner fails to note that Gray endorsed a reasonable cutoff date for the inclusion of projects in a cumulative analysis: The lead agency "had the discretion to set the date of the application for the current Project as the cutoff date to determine which projects should be included in the cumulative impacts analysis." (Id. at p. 1128.)

The more important point, however, is that the EIR's analysis of project impacts included traffic conditions in 2030 with and without the project, relying on projections in SCAG's Regional Transportation Plan, Metro's long-range plan, and the general plans for the relevant municipalities. Consequently, traffic increases and intersection delays based on those plans were indeed taken into account, albeit in a more generalized way than petitioner would prefer.<sup>12</sup> Thus, this is not a case, like *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, where the EIR "avoids analyzing the severity of the problem and allows the approval of projects which, when taken in isolation, appear insignificant, but when viewed together, appear startling." (*Id.* at p. 721.)

Here, the Expo Authority employed the "summary of projections" approach. The EIR's traffic analysis, based as it is on projected traffic conditions in 2030, discloses

<sup>&</sup>lt;sup>12</sup> As the Expo Authority stated in responding to comments on the draft EIR, "The Casden project has not yet been approved for construction, and is therefore speculative. The Casden project was listed in the projects considered under Cumulative Impacts. In addition, jobs and housing that would potentially be created by the project are included within the 2030 SCAG Growth Estimates used in the Travel Demand Model."

" 'the severity and significance of the cumulative impacts ....' " (*City of Long Beach v. Los Angeles Unified School Dist.* (2009) 176 Cal.App.4th 889, 906.) What it does *not* include is a microanalysis of those impacts as they may be affected at a particular intersection by a particular project that was not under environmental review when the draft EIR was circulated. But there is no requirement for such an analysis where the lead agency has used the "summary of projections" approach. Indeed, the Guidelines tell us that the discussion of cumulative impacts "shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness ....." (Guidelines, § 15130, subd. (b).) That standard is met here.

#### 6. The Adequacy of Mitigation Measures

Petitioner contends the EIR failed to provide adequate mitigation measures, and improperly deferred the formulation of mitigation measures, in the areas of parking, noise and vibration, public safety, and construction. We summarize the legal requirements, and then discuss each contested area in turn.

When significant effects on the environment have been identified in an EIR, the public agency must make one or more of several possible findings with respect to each significant effect. The agency must find, based on substantial evidence, that changes "have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment"; or that those changes "are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency"; or that mitigation is infeasible and overriding considerations outweigh the significant environmental effects. (§ 21081; Guidelines, § 15091.)

When mitigating changes have been required to avoid the significant effects, the agency must "adopt a reporting or monitoring program for the changes, . . . designed to ensure compliance during project implementation." (§ 21081.6, subd. (a)(1).) And the agency "shall provide that measures to mitigate or avoid significant effects on the

environment are fully enforceable through permit conditions, agreements, or other measures." (§ 21081.6, subd. (b).) "The purpose of these requirements is to ensure that feasible mitigation measures will actually be implemented as a condition of development, and not merely adopted and then neglected or disregarded." (*Federation, supra*, 83 Cal.App.4th at p. 1261, italics omitted.)

The formulation of specific mitigation measures may be deferred if it is impractical to formulate them at the time of project approval. "Deferral of the specifics of mitigation is permissible where the local entity commits itself to mitigation and lists the alternatives to be considered, analyzed and possibly incorporated in the mitigation plan." (*Defend the Bay v. City of Irvine* (2004) 119 Cal.App.4th 1261, 1275 (*Defend the Bay*); Sacramento Old City Assn. v. City Council (1991) 229 Cal.App.3d 1011, 1028-1029 (Sacramento Old City) [" 'for [the] kinds of impacts for which mitigation is known to be feasible, but where practical considerations prohibit devising such measures early in the planning process . . . , the agency can commit itself to eventually devising measures that will satisfy specific performance criteria articulated at the time of project approval' "].)

In the discussion of mitigation measures, an EIR "need not be exhaustive or perfect; it is simply required to 'describe feasible measures which could minimize significant adverse impacts.' " (*San Franciscans Upholding the Downtown Plan v. City and County of San Francisco* (2002) 102 Cal.App.4th 656, 696.) "We review the EIR's discussion of mitigation measures by the traditional substantial evidence standard. It is not our task to determine whether adverse effects could be better mitigated." (*Ibid.*)

# a. Parking

# i. Spillover parking

The EIR concludes that the demand for parking "will exceed the proposed supply at several stations, potentially resulting in some parking intrusion into adjacent neighborhoods. Spillover parking in the neighborhoods around the stations can be expected to occur around all of the stations except the Sepulveda/National." To mitigate

this potentially significant impact, the Expo Authority adopted mitigation measure MM TR-4, providing that:

"In the quarter mile area surrounding each station where spillover parking is anticipated, a program shall be established to monitor the on-street parking activity in the area prior to the opening of service and shall monitor the availability of parking monthly for six months following the opening of service. If a parking shortage is determined to have occurred (i.e., existing parking space utilization increases to 100 percent) due to the parking activity of the LRT patrons, Metro shall work with the appropriate local jurisdiction and affected communities to assess the need for and specific elements of a permit parking program for the impacted neighborhoods. The guidelines established by each local jurisdiction for the assessment of permit parking programs and the development of community consensus on the details of the permit program shall be followed. Metro shall reimburse the local jurisdictions for the costs associated with developing the local permit parking programs within one-quarter mile of the stations and for the costs of the signs posted in the neighborhoods. Metro will not be responsible for the costs of permits for residents desiring to park on the streets in the permit districts. For those locations where station spillover parking cannot be addressed through implementation of a permit program, alternative mitigation options include time-restricted, metered, or shared parking arrangements. Metro will work with the local jurisdictions to determine which option(s) to implement."

The EIR concluded this mitigation measure would reduce the impacts of station spillover parking to a less than significant level.

Petitioner contends the record does not contain substantial evidence of the "feasibility or effectiveness" of MM TR-4, as there is "no assurance that any such [permit parking] program will ever be formed, or that it would be effective in preventing 'spillover' parking," or that the alternative mitigation options would be implemented or effective. Petitioner further complains the measure is "improper deferral" of mitigation, that residents will have to pay for permits, and that, under *Gray*, *supra*, 167 Cal.App.4th at page 1119, the mitigation measure is inadequate unless it "ensure[s] that residents in the vicinity of LRT stations will retain their ability to park in their neighborhoods in substantially the same manner to which they are currently accustomed." We understand

petitioner's concern, as would any resident of Los Angeles, Culver City or Santa Monica, but we disagree with this contention.

Gray does not establish that these mitigation plans are inadequate. Gray, which involved water resources, not parking, disapproved several measures that were proposed to mitigate a decline in water levels in private wells that would result from a proposed mining operation. (Gray, supra, 167 Cal.App.4th at p. 1115.) One of the measures was to provide bottled water. The court stated that it "defies common sense . . . to conclude that providing bottled water is an effective mitigation measure"; the measure "does not explain how and in what amount the bottled water will be delivered"; landowners had fluctuating, often unpredictable water usage needs; the measure did not explain how the water bottles would be replaced or recycled; and the measure improperly deferred formulation of specific mitigation strategies, as the agency committed itself only to a goal that included no performance standards (rather than to a mitigation strategy). (Id. at p. 1118.) The court concluded that "the listed mitigation alternatives, except for the building of a new water system [which had not been studied], cannot remedy the water problems because they would not place neighboring landowners into a situation substantially similar to what the landowners experienced prior to the operation of the mine." (Id. at p. 1119.)

The *Gray* case is not analogous to this case. This is not a case where the effectiveness of a mitigation measure "defies common sense." (*Gray, supra,* 167 Cal.App.4th at p. 1118.) The change to permit parking for residents in neighborhoods near transit stations makes sense and is "substantially similar" to parking without the need for a permit; it is obviously not the *same*, but residents will still have street parking. We are not persuaded that permit parking will fail to reduce the impact of spillover parking.

Nor do we accept the claim that the measure is inadequate for lack of "assurance" that permit parking programs will be formed and effective in preventing spillover parking. The mitigation measure sets a specific performance standard—monitoring parking activity to determine if LRT activity increases parking utilization to 100

percent—and if it does, Metro undertakes to work with local jurisdictions, to follow their guidelines for permit parking programs, and to reimburse their costs. (See *Defend the Bay, supra*, 119 Cal.App.4th at p. 1275 [deferral of specifics is permissible where the local entity commits itself to mitigation and lists the alternatives to be considered].) We will not assume, as petitioner implicitly suggests, that simply because the Expo Authority cannot *require* a local jurisdiction to adopt a permit program, the mitigation measure is inadequate. (Cf. § 21081 [one of the possible findings an agency may make with respect to a significant effect is that changes mitigating or avoiding the significant effect "are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency"].) Petitioner has not shown any deficiency in the spillover parking mitigation measure.<sup>13</sup>

# ii. Removal of street parking

The Expo Phase 2 project will eliminate street parking in some areas along the project corridor. One of these is on the south side of Colorado Avenue between 14th Street and Lincoln Boulevard and on either the north or south side of the street between Lincoln Boulevard and 4th Street. Surveys revealed moderate to intensive use of those spaces with little excess capacity on adjacent side streets, requiring mitigation measures to reduce the impacts of displaced street parking spaces. (The Expo Authority's responses to comments on this issue show that of 56 parking spaces proposed to be

<sup>&</sup>lt;sup>13</sup> Petitioner cites *Federation, supra*, 83 Cal.App.4th at p. 1260, where the court agreed with the contention that there was "no assurance that the mitigation measures will be implemented." But in *Federation*, where the mitigation measures involved improvements in transportation infrastructure requiring the cooperative efforts of several state, local and federal public agencies, in addition to the city (the lead agency) (*id.* at p. 1256), the city admitted that its portion of the cost would far exceed its anticipated revenues (*ibid.*), and "acknowledged . . . that there was great uncertainty as to whether the mitigation measures would ever be funded or implemented." (*Id.* at p. 1261.) Consequently, the court could find no substantial evidence that the mitigation measures would actually be implemented. (*Ibid.*) This is not such a case.

eliminated on the south side of Colorado Avenue between 14th Street and 4th Street, 35 were regularly used.)

The EIR proposed mitigation measures as follows:

*"MMTR-9* Colorado Avenue. Replacement parking would be required along impacted portions of Colorado Avenue. The potential replacement parking lots are listed below. Additional replacement options could include implementation of diagonal parking on adjacent streets (after extensive neighborhood outreach), or the implementation of design options, which would reduce the extent of parking impacts[.]<sup>[14]</sup>

*"MM TR-9(a)* South side of Colorado Avenue, between 14th Street and 11th Street. Property would have to be acquired to provide replacement parking. Potential parcels on the south side of Colorado Avenue between 18th Street and 16th Street have been identified.

*"MM TR-9(b)* South side of Colorado Avenue, between 11th Street and 4th Street. Property would have to be acquired to provide replacement parking. A potential parcel at the northwest corner of 6th Street and Colorado Avenue has been identified."

The EIR concluded that implementation of these mitigation measures would reduce the impact of displaced parking spaces to less than significant.

Petitioner contends there is no evidence these measures would be feasible, and that the Expo Authority's ability to acquire replacement lots is "purely speculative" because of high land costs. Petitioner again claims there is "no assurance that replacement parking will actually be provided" and, therefore, as in *Federation*, *supra*, 83 Cal.App.4th

<sup>&</sup>lt;sup>14</sup> The EIR described two design options. First, "[t]he Colorado Parking Retention Design Option would reduce the track centers and sidewalk widths to create room for parking between Lincoln Boulevard and 4th Street along both sides of Colorado Avenue. Impacts to on-street parking along Segment 3a (Colorado) would remain *less than significant.*" Second, "[t]he Colorado/4th Parallel Platform and South Side Parking Design Option would reconfigure the Colorado/4th Street Station so that the platform would be parallel with 4th Street. If implemented, this design option would create room for parking between Lincoln Boulevard and 6th Street along the south side of Colorado Avenue. Impacts to on-street parking along Segment 3a (Colorado) would remain *less than significant.*"

at page 1261, "great uncertainty as to whether the mitigation measures would ever be funded or implemented." But as we have seen (fn. 13 *ante*, at p. 34), in *Federation* the agency "acknowledged . . . that there was great uncertainty as to whether the mitigation measures would ever be funded or implemented." (*Ibid.*) There was no such evidence here, and no such uncertainty.

Petitioner does not challenge the EIR's financial evaluation of the Expo Authority's ability to build the project, which includes allowance for mitigation measures. (See also *Santa Clarita Organization for Planning the Environment v. County of Los Angeles* (2007) 157 Cal.App.4th 149, 163 ["[h]ere, unlike *Federation*, there is nothing to suggest the mitigation measures will not be implemented"; the appellant pointed to "nothing in *Federation* or any other case that requires the EIR to discuss funding for mitigation measures"].) The parking mitigation measures explicitly state that property "would have to be acquired to provide replacement parking," and parcels have been identified for that purpose. These mitigation measures are not uncertain or speculative, and it is feasible to acquire the identified parcels for parking. Again, petitioner has not met its burden to demonstrate any deficiency.

# b. Noise and vibration

Petitioner challenges mitigation measure MM NOI-1, which the EIR states will ensure that operational noise levels will be below the applicable FTA (Federal Transit Administration) impact threshold for moderate noise impact. The measure provides for installation, at certain locations, of sound walls—a mitigation measure widely used on highways and rail transit lines—or, alternatively, the construction of a landscaped berm parallel to the rail line, or some combination of sound wall and berm. This would eliminate the predicted noise impact "[e]xcept where noise impacts are due to special trackwork at crossovers and turnouts . . . ." In these instances (and in the case of sound receivers in high rise apartment buildings), other options were specified as an alternative or supplement to sound walls. The mitigation measure continues:

"If during Final Engineering or Operations it is determined that measures described above are not practicable or do not provide sufficient noise mitigation, the Expo Authority or Metro, as appropriate, shall provide for sound insulation of residences and other noise-sensitive facilities as . . . another alternative that could be used. Sound insulation involves upgrading or replacing existing windows and doors, and weather stripping windows and doors. Installing a mechanical ventilation system may be needed so that windows do not need to be opened for ventilation." (Italics omitted.)

Petitioner objects that, for the situations where the sound walls and berms will *not* suffice, the EIR gives no information "how such improvements [(sound insulation, etc.)] to private structures would actually be 'provided' by Expo or Metro"; there is no evidence "that it would be feasible to do so in all cases"; residents affected would have to keep their windows closed; and the mitigation measures would not mitigate noise impacts while residents are outdoors.

But CEQA does not require a lead agency to detail "how" it will "actually" provide the insulation. (See *Sacramento Old City*, *supra*, 229 Cal.App.3d at pp. 1028-1029 [" 'the agency can commit itself to eventually devising measures that will satisfy specific performance criteria articulated at the time of project approval' "].) The mitigation measure states exactly what the Expo Authority will do, if necessary. The Expo Authority commits in its mitigation monitoring and reporting program to provide sound insulation where needed to meet the applicable noise threshold, and sound insulation is an established method of mitigating noise impacts. Petitioner is mistaken in contending, in reliance on *Gray*, *supra*, 167 Cal.App.4th at pp. 1117-1118 (discussed in part 6.a.i. *ante*, at pp. 32-33), that residents must be "restore[d] . . . to the position that they are currently accustomed to"; mitigation requires impacts to be minimized to less than significant, not eliminated. (See Guidelines, § 15370.)

# c. Safety

The EIR acknowledges that emergency vehicles traveling on streets intersecting at-grade crossings may encounter some delay when a light rail vehicle is crossing the street, since emergency vehicles will be unable to cross while the railroad gates are down. Mitigation measure MM SAF-1 addresses this impact, specifying that, before operations begin, Metro must coordinate with the Cities of Los Angeles, Culver City and Santa

Monica; give community safety providers a detailed description of Metro's emergency response procedures; and encourage the cities to update their emergency response procedures to address implementation of the project. The EIR notes, in response to comments, that the Cities of Los Angeles, Pasadena, South Pasadena, and Long Beach have successfully implemented the procedures described in this mitigation measure on other Metro rail lines. Implementation of this measure, the EIR concludes, will render impacts to the delivery of community safety services less than significant.

Petitioner contends there is insufficient evidence the mitigation measure would be effective, and insufficient evidence the cities would "actually implement any of the necessary 'updates' to their emergency response plans," again creating, as in *Federation*, "great uncertainty as to whether the mitigation measures would ever be funded or implemented." (*Federation, supra*, 83 Cal.App.4th at p. 1261.) Petitioner's citation to *Federation* is misplaced (see discussion in fn. 13, *ante*, at p. 34), and we see no reason to conclude the cities involved will fail to act to update their emergency procedures to address "any change in circulation patterns associated with the project," just as other municipalities have in the past. (Cf. § 21081; Guidelines, § 15091, subd. (a)(2) [an agency may find that changes that will avoid or lessen a significant environmental effect "are within the responsibility and jurisdiction of another public agency" and "can and should be adopted by such other agency"].) Petitioner has not shown any inadequacy in the Expo Authority's mitigation of potential safety impacts.

#### d. Construction

The EIR found that construction of the project could result in the closure of one or more lanes of a major/arterial traffic-carrying street for an extended period of time (one month or more) during construction. The Expo Authority proposed three mitigation measures that it concluded would reduce this significant impact to a level less than significant.

First (MM CON-1), the Expo Authority is required to provide "at least one lane of traffic in each direction on access cross streets that are not going to be dead-ended during

construction. If one lane of traffic cannot be maintained, the Expo Authority shall provide a detour route for motorists."

Second (MM CON-2), "Worksite Traffic Control Plans (WTCP) and Traffic Circulation Plans, including identification of detour requirements, will be formulated in cooperation with" the cities and other affected jurisdictions "in accordance with the Work Area Traffic Control Handbook (WATCH) manual and Manual on Uniform Traffic Control Devices (MUTCD) as required by the relevant municipality." The WTCP's "will be based on lane requirements and other special requirements defined by" the LADOT and the other municipalities "for construction within their city and from other appropriate agencies for construction in those jurisdictions." These plans must also "be designed to maintain designated Safe Routes to School wherever possible during times of the year when nearby schools are in session."

Third (MM CON-3), no designated major or secondary highway will be closed to vehicular or pedestrian traffic "except at night or on weekends, unless approval is granted by the jurisdiction in which it is located."

Petitioner contends there is no evidence these measures would be effective or feasible, because (1) there are no standards by which relevant jurisdictions may grant approval for weekday street closures under MM CON-3, and (2) MM CON-2 does not address "the potential safety impacts that may arise where maintaining . . . designated Safe Routes to School would not be possible," and "improperly defers mitigation without including any performance standards," so there is no evidence the measure would be enforceable.

The law does not require that an EIR specify the standards under which different jurisdictions will decide whether or not to approve weekday road closures. The EIR contemplates that major arteries will not be closed during nonweekend and nonevening hours without that approval, which is an acceptable performance standard. Moreover, as the Expo Authority points out, MM CON-3 must be considered in conjunction with the other mitigation measures that address the same impact (closure of major/arterial streets). MM CON-2 contains multiple performance standards that must be satisfied before major

arterial streets may be closed during construction, whether in the evening or otherwise. The Expo Authority is required to comply with the traffic control and traffic circulation plans that are formulated in cooperation with the affected jurisdictions, and these must be formulated in accordance with specified manuals "as required by the relevant municipality." (See *Endangered Habitats League, Inc. v. County of Orange* (2005) 131 Cal.App.4th 777, 794 [fuel modification plan to be prepared that must comply with county guidelines and be approved by county is not improper deferral].) Petitioner has demonstrated no inadequacy in the Expo Authority's construction mitigation measures.

# 7. Project Alternatives

An EIR must "consider alternatives to proposed actions affecting the environment." (§ 21001, subd. (g).) One of the purposes of the EIR is "to identify alternatives to the project . . . ." (§§ 21002.1, subd. (a), 21061 [purpose is "to list ways in which the significant effects of such a project might be minimized; and to indicate alternatives to such a project"].) The guideline is feasibility: "[P]ublic agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects . . . ." (§ 21002.)

The "'statutory requirements for consideration of alternatives must be judged against a rule of reason.'" (*Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 565 (*Goleta Valley*).) "CEQA establishes no categorical legal imperative as to the scope of alternatives to be analyzed in an EIR. Each case must be evaluated on its facts, which in turn must be reviewed in light of the statutory purpose." (*Id.* at p. 566.) An EIR "need not consider every conceivable alternative to a project." (Guidelines, § 15126.6, subd. (a).) An EIR "must consider a reasonable range of alternatives to the project, or to the location of the project, which: (1) offer substantial environmental advantages over the project proposal [(§ 21002)]; and (2) may be 'feasibly accomplished in a successful manner' considering the economic, environmental, social and technological factors involved." (*Goleta Valley*, at p. 566, italics omitted, citing § 21061.1 & Guidelines, § 15364.) "Among the factors that may be used to eliminate

alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts." (Guidelines, § 15126.6, subd. (c).)

Petitioner contends the EIR here is inadequate because it did not "consider an alternative or design option with grade-separation in Segment 1 (from and including Overland Avenue to Sepulveda Boulevard) . . . ." While the EIR "briefly discussed and rejected the option of grade-separation at Overland Avenue and Westwood Boulevard, this cursory discussion failed to address whether such an alternative or design option could potentially avoid or reduce the impacts of the Project." And, petitioner continues, the record does not support a conclusion that grade separation is infeasible.

We see no inadequacy in the EIR's failure to include a detailed examination of an alternative with grade-separated crossings in Segment 1 instead of at-grade crossings. It is unnecessary to consider "every conceivable alternative" (Guidelines, § 15126.6, subd. (a)), and the EIR evaluated every at-grade crossing in each of the LRT alternatives. We do not find the EIR's discussion of grade separation at Overland and Westwood to be "cursory." The EIR discussed a trench option (underground grade separation) and an aerial structure, and concluded grade separation was unnecessary to mitigate significant impacts, and indeed would create other environmental impacts. The *summary* of its grade-separation analysis was this:

"In summary, the proposed at-grade alignment at Overland Avenue and Westwood Boulevard could operate safely and minimize impacts to a lessthan-significant level, as required by CEQA. As such, a grade separation in these locations would not be needed to mitigate significant impacts, and if anything, would generate other environmental impacts. Construction impacts associated with a grade separation at Overland Avenue and Westwood Boulevard would be more extensive and disruptive to the adjacent community and nearby school. In addition, grade separating Overland Avenue and Westwood Boulevard would substantially increase costs, requiring more local funding and reducing the project's overall cost effectiveness with respect to [Federal Transit Administration] standards. Further, the at-grade crossings would be consistent with Metro's policy guidance for evaluating grade crossings relative to safety, traffic, and other considerations.

"As a result of the community impacts, constructability issues, and cost implications, the Expo Phase 2 project objectives are better accomplished and CEQA significance thresholds are achieved with an at-grade configuration of both Overland Avenue and Westwood Boulevard. Therefore, a trench under Overland Avenue and Westwood Boulevard is not recommended to be retained in the [final EIR] for further consideration, nor is an aerial structure."<sup>15</sup>

In short, petitioner has not shown that detailed consideration of an alternative with grade-separated crossings was required, or that such an alternative might have offered "substantial environmental advantages over the project proposal . . . ." (*Goleta Valley*, *supra*, 52 Cal.3d at p. 566; see also *Citizens of Goleta Valley* v. *Board of Supervisors* (1988) 197 Cal.App.3d 1167, 1177-1178 ["The range of alternatives is governed by the 'rule of reason,' which requires only an analysis of those alternatives necessary to permit a reasoned choice."].) Every at-grade crossing was evaluated in connection with other alternatives, and the impacts of the project were mitigated to a less than significant level. The "rule of reason" governs (*Goleta Valley*, *supra*, 52 Cal.3d at p. 576), and each case "must be evaluated on its facts . . .." (*Id.* at p. 565.) On this record, we conclude the Expo Authority evaluated a reasonable range of alternatives.

# 8. Recirculation

Petitioner argues that the final EIR reflected "major changes" to the project made after circulation of the draft EIR, requiring recirculation of the EIR in draft form for further public comment.

CEQA requires recirculation and opportunity for comment before certification of an EIR when "significant new information" is added. (§ 21092.1.) The law on when

<sup>&</sup>lt;sup>15</sup> The trench option involved disruption of existing storm drains and construction of a pump station or an inverted siphon; creation of a large depressed area, which could become flooded in the event of a major storm, thus requiring flood proofing; a substantial increase in construction impacts; and significantly higher costs. The visual impacts of an aerial structure would be significantly greater, as would its construction impacts, and an aerial structure would also have greater costs and worse cost effectiveness.

recirculation is required was settled in *Laurel Heights Improvement Assn. v. Regents of University of California* (1993) 6 Cal.4th 1112 (*Laurel Heights II*). There, the court concluded that "the addition of new information to an EIR after the close of the public comment period is not 'significant' unless the EIR is changed in a way that deprives the public of a meaningful opportunity to comment upon a *substantial* adverse environmental effect of the project or a feasible way to mitigate or avoid such an effect (including a feasible project alternative) that the project's proponents have declined to implement." (*Id.* at p. 1129.)

*Laurel Heights II* continued: "[R]ecirculation is not required where the new information added to the EIR 'merely clarifies or amplifies [citations] or makes insignificant modifications in [citation] an adequate EIR.' [Citation.] On the other hand, recirculation is required, for example, when the new information added to an EIR discloses: (1) a new substantial environmental impact resulting from the project or from a new mitigation measure proposed to be implemented [citation]; (2) a substantial increase in the severity of an environmental impact unless mitigation measures are adopted that reduce the impact to a level of insignificance [citation]; (3) a feasible project alternative or mitigation measure that clearly would lessen the environmental impacts of the project, but which the project's proponents decline to adopt [citation]; or (4) that the draft EIR was so fundamentally and basically inadequate and conclusory in nature that public comment on the draft was in effect meaningless [citation]." (*Laurel Heights II*, *supra*, 6 Cal.4th at pp.1129-1130.)

The substantial evidence standard governs the lead agency's decision not to recirculate an EIR, with reasonable doubts resolved in favor of the administrative decision. (*Laurel Heights II, supra*, 6 Cal.4th at p. 1135.)

Petitioner contends "significant new information" was added to the final EIR, including new information on grade separation at various intersections; signal phasing at the intersection of Westwood Boulevard and Exposition Boulevard North; parking; and noise impacts (all described, *post*).<sup>16</sup> None of the added information discloses "a new substantial environmental impact," or a "substantial increase in the severity" of an impact of the project. (*Laurel Heights II, supra*, 6 Cal.4th at p. 1130; Guidelines, § 15088.5, subd. (a)(1), (2).) As the trial court pointed out, "[i]f anything, the information added (five additional sound walls, signal phasing, and parking surveys) served to lessen the severity of an impact." Substantial evidence supports the Expo Authority's decision not to recirculate the EIR before certification. We address each of petitioner's claims in turn.<sup>17</sup>

<u>Grade separation</u>. Petitioner points out that, after circulation of the draft EIR, additional studies were prepared further evaluating grade separation at various intersections; these were discussed in the final EIR, which indicates that the studies "resulted in changes to the project, including modifications to impacts and mitigation measures." The changes included grade separation (elevation) at Centinela Avenue, and a design option for grade separation using an aerial structure at Sepulveda Boulevard (subsequently adopted by the Expo Authority). Petitioner says there was no meaningful opportunity to comment on the studies and conclusions. But that is not the standard for recirculation of an EIR; the question is whether the new information disclosed a substantial adverse effect (or increase in severity), in which case the public *should* have

<sup>&</sup>lt;sup>16</sup> Petitioner also recites, in its list of "major changes," two other items: the addition of a third northbound lane on Sepulveda Boulevard and a new design option for changes to the Santa Monica maintenance facility. Petitioner does not elaborate on these items and makes no argument as to why or how these changes show new significant environmental impacts or a substantial increase in the severity of an impact, so we will not consider them.

<sup>&</sup>lt;sup>17</sup> Petitioner also contends recirculation was required because the draft EIR was, as stated in Guideline section 15088.5, subdivision (a)(4), "so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded." This contention is based on the "fail[ure] to evaluate grade-separated alternatives from, and including, Overland Avenue to Sepulveda Boulevard." We have already rejected the contention that the Expo Authority was required to include such an alternative (part 7, *ante*, at pp. 41-42).

an opportunity to comment. That is not the case here. The additional evaluations and analyses were conducted in response to public comments. The grade separation at Centinela and the design option for grade separation at Sepulveda, adopted as a result of those new studies, were not "new significant environmental impact[s]" that would result from the project or a "substantial increase in the severity" of an impact, upon which the public should have had an opportunity to comment. (Guidelines, § 15088.5, subd. (a)(1), (2).) On the contrary, they were improvements to traffic impacts at those locations. Petitioner cites nothing in its briefs that suggests otherwise.<sup>18</sup>

Signal phasing. After the draft EIR was circulated, signal phasing was refined at the intersection of Westwood Boulevard and Exposition Boulevard North, resulting in revisions in the level of service and delay. The draft EIR showed, during the morning peak hour, an "A" level of service with a delay of only four seconds; the final EIR shows a "D" level of service and a delay of 38 seconds. For the afternoon peak hour, the level of service changed from "B" to "C" and the delay changed from 10.9 seconds to 23.4

18 For the first time in its reply brief, petitioner suggests that the new design option for an aerial station at Sepulveda will have adverse visual impacts, and for this proposition it cites analyses of elevated grade-separations at other locations in other LRT alternatives (including a 5.5 mile-long elevated structure) that were rejected. Even if the point had not been waived by failing to raise it in its opening brief, the analyses petitioner cites are irrelevant to consideration of an entirely different aerial structure. The final EIR concluded the structure would result in less than significant visual impacts, stating: "Within Visual Character Area C, the Exposition [right-of-way] is screened from view by the residences by use of heavy landscaping in this area. The aerial structure would offer passing motorists using Sepulveda Boulevard highly visible but fleeting views of the aerial structure. Residents to the south along Exposition Boulevard would have the greatest visibility of the aerial structure; however, these views would be screened as feasible as landscaping would be incorporated to screen the Expo [right-of-way] from view, as would other design features specified by the Metro Design Criteria to reduce visual impacts. Therefore, implementation of the Sepulveda Grade Separation Design Option would not result in a degradation of the area, and, as such, introduction of the Sepulveda Grade Separation Design Option would result in less than significant impacts."

seconds. Petitioner contends these changes constituted a "substantial increase in the severity of an environmental impact," requiring recirculation.

Petitioner has failed to consider the entirety of the recirculation standard. As Laurel Heights II and the Guidelines make clear, recirculation is required when the new information added to an EIR discloses a substantial increase in the severity of an environmental impact "unless mitigation measures are adopted that reduce the impact to a level of insignificance .... " (Laurel Heights II, supra, 6 Cal.4th at p. 1130, italics added; Guidelines, § 15088.5, subd. (a)(2).) Even with the increase in the average delay at the intersection of Westwood and Exposition Boulevards, the intersection will operate within the impact threshold identified in the draft EIR as less than significant: the impact is significant "if the project traffic is projected to cause deterioration in level of service to LOS E or worse." Petitioner contends this added "significant new information" on "the availability of, and restrictions on, the 'potential replacement options' that had been identified in the [draft EIR] for the loss of on-street parking spaces along Sepulveda Boulevard, Westwood Boulevard, and Overland Avenue." According to petitioner, this new information "undermines" the conclusion that the project would have a less than significant impact on the supply of on-street parking along those three streets. But that is all petitioner says. Petitioner fails even to identify the nature of the new information to which it objects, much less to explain how that new information would cause a "new significant environmental impact" or cause a "substantial increase in the severity" of an impact. (Guidelines, § 15088.5, subd. (a)(1), (2).) Under these circumstances, petitioner has waived the issue. (See Inyo Citizens for Better Planning v. Inyo County Bd. of Supervisors (2009) 180 Cal.App.4th 1, 14 [" '[w]e are not required to search the record to ascertain whether it contains support for [petitioner's] contentions' "; "the issue, to the extent one has been raised, is waived"].)

Petitioner also points out that in the final EIR, a proposed parking lot at the Colorado/4th Street station that had been in the draft EIR was eliminated. The final EIR concludes that the approximately 215-space demand for parking at the station could be accommodated in adjacent existing public parking facilities in downtown Santa Monica.

Finally, petitioner complains of an added design option that, if implemented, would permit the elimination of a proposed 170-space "park-and-ride" lot at the Expo/Westwood station. But petitioner identifies no reason to believe this option would alter the conclusions reached after the additional parking surveys were performed: that demand for replacement parking for removed spaces could be accommodated in various ways including permit parking. Further, the final EIR indicates that if this design option is used, "[t]o address community concerns regarding the loss of on-street parking along Westwood Boulevard, 20 parking spaces would be dedicated to neighborhood residents east of Westwood Boulevard and north of the LRT line." The conclusion was that impacts would remain less than significant. Again, no adverse impact is disclosed by the added design option.

<u>Noise</u>. Petitioner complains that new information was added to the final EIR concerning mitigation measures for noise impacts. This consists of information showing that (a) the number of receptors that will be moderately impacted by noise will increase from 162 to 171, and the number severely impacted will increase from 49 to 67; (b) studio uses along the Sepulveda-Cloverfield segment will be severely impacted by noise; and (c) as a result of the increased severity of noise impacts, the final EIR identifies five additional locations requiring soundwalls as mitigation.<sup>19</sup>

Petitioner complains the public was denied the opportunity to comment "on the efficacy and potential impacts of these additional sound walls, as well as potential mitigation measures to address such impacts." Again, this contention misconstrues the meaning of "significant new information." The Expo Authority conducted additional noise testing and analysis in more locations in response to comments on the draft EIR, focusing on sensitive receptors including studios, schools and residential areas. That

<sup>&</sup>lt;sup>19</sup> Petitioner also asserts there was new information that station public address systems may cause significant noise impacts during nighttime hours. But the final EIR stated that "[w]ith proper design of the public address systems and the automatic volume adjustment, the noise from the PA system should not generate any adverse effects in communities near the stations."

further analysis identified additional receptors that were affected, but with the addition of five soundwalls—the same established mitigation technique identified in the draft EIR—the noise levels "will be below the applicable FTA impact threshold for moderate noise impact."

New information requires recirculation of the EIR if it shows a "substantial increase in the severity of an environmental impact . . . unless mitigation measures are adopted that reduce the impact to a level of insignificance." (Guidelines, § 15088.5, subd. (a)(2).) So, even if one concludes the increase in the number of affected receptors amounted to a substantial increase in the severity of the noise impacts, mitigation measures were adopted (the additional soundwalls) reducing the impact to less than significant. And petitioner does not suggest how or why any of the additional soundwalls might have a significant environmental impact. Accordingly, recirculation was not required. (See *Laurel Heights II, supra*, 6 Cal.4th at p. 1132 ["the Legislature did not intend to promote endless rounds of revision and recirculation of EIR's"; recirculation "was intended to be an exception, rather than the general rule"].)

# DISPOSITION

The judgment is affirmed. Respondents shall recover their costs on appeal. CERTIFIED FOR PARTIAL PUBLICATION

GRIMES, J.

WE CONCUR:

BIGELOW, P. J.

FLIER, J.

# **EXHIBIT B**



# COUNTY OF LOS ANGELES OFFICE OF THE COUNTY COUNSEL

TRANSPORTATION DIVISION ONE GATEWAY PLAZA LOS ANGELES, CALIFORNIA 90012-2952

JOHN F. KRATTLI Acting County Counsel

May 7, 2012

TELEPHONE (213) 922-2525 FACSIMILE (213) 922-2531 TDD (213) 633-0901

The Honorable Patricia Bigelow The Honorable Elizabeth A. Grimes The Honorable Madeleine Flier California Court of Appeal, Second Appellate District, Division Eight Ronald Reagan State Building 300 S. Spring Street, 2nd Floor, North Tower Los Angeles, California, 90013

**Re:** Request for Publication

Neighbors for Smart Rail v. Exposition Metro Line Construction Authority et al. (Case No. B232655)

Dear : Dear Justices Bigelow, Grimes, and Flier:

Pursuant to California Rules of Court, Rule 8.1120, subdivision (a), the Los Angeles County Metropolitan Transportation Authority ("Metro"), respectfully requests publication of Parts 5 through 8 of the opinion issued by this Court in *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority et al.* (April 17, 2012, B232655) (the "Opinion"). Currently, only Parts 1 through 3 of the Opinion have been ordered published. Metro makes this request because it believes Parts 5 through 8 of the Opinion also contain sound legal principles that, if enshrined in case law, would benefit Californians.

This letter sets forth Metro's interest in publication and the reasons it believes Parts 5 through 8 of the Opinion meet the standards for publication set forth in California Rules of Court, Rule 8.1105, subdivision (c). As described in more detail below, those parts of the Opinion 1) explain and clarify existing rules of law; 2) include very helpful explanation and clarification of existing principles under the California Environmental Quality Act ("CEQA") (Pub. Resources Code, § 21000 et seq.); and, 3) involve legal issues of continuing public interest. (Cal. Rules of Court, Rule 8.1105, subdivisions (c)(2), (c)(3), (c)(4), and (c)(6).)

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#### 1. Metro has an interest in publication of the Opinion.

Metro is a statutory regional transportation planning and public transportation agency operating for the County of Los Angeles. (See Pub. Util. Code, §§ 130050, 130051.) With the influx of Measure R<sup>1</sup> dollars, Metro is currently undertaking environmental review of several regional transportation projects and is involved in litigation defending its approval of some such projects under CEQA. The issues addressed in Parts 5 through 8 of the Opinion are being raised both administratively and in litigation challenging Metro's environmental review of its various proposed regional transportation projects and the Opinion would provide helpful guidance in addressing these issues both with respect to currently pending projects and approved projects that are being challenged in the courts. ١

Metro also believes that publication of Parts 5 through 8 of the Opinion would be helpful to public agencies throughout the State of California, who are undertaking projects that could impact various jurisdictions, projects that are likely to undergo modifications and additional analysis as a result of the CEQA review process, and projects that will rely on regulatory or other standards in reducing impacts to less-than-significant levels. As discussed below, if Parts 5 through 8 of Opinion were published, the Opinion's holdings on the issues of mitigation measures, alternatives, the duty to recirculate an EIR for additional public review, and requirements regarding cumulative impact analyses would provide clarification on frequently litigated issues.

# 2. The Opinion provides important clarification regarding the reliance on performance standards in the formulation of mitigation measures under CEQA in a context that is different from any prior decision.

The Opinion gives important guidance regarding the formulation of adequate mitigation measures under CEQA. (Opinion, pp. 30-39, § 6.) In particular, the Opinion offers valuable instruction regarding the reliance on specific performance standards to provide adequate assurance that a mitigation measure will be effective at reducing a particular impact. In recent years, the courts of appeal have grappled with the circumstances in which deferral of

<sup>&</sup>lt;sup>1</sup> In November 2008, Los Angeles County voters approved Measure R, committing a projected \$40 billion to traffic relief and transportation upgrades throughout the county over the next 30 years.

specifics of mitigation measures are permissible.<sup>2</sup> None of the recent cases, however, consider nearly the broad range of impact categories as those at issue in the Opinion, making the Opinion particularly useful in understanding the application of CEQA's requirements to mitigate environmental impacts to a range of potential impact categories.

Moreover, none of the recent cases provide as clear of guidance regarding the amount of detail necessary to include in a mitigation measure in order to support a conclusion that the mitigation measure would reduce impacts to less than significant.<sup>3</sup> The Opinion makes clear, however, that the level of detail set forth in an EIR's mitigation measures need not be exhaustive and that the courts will uphold the mitigation measures provided they are supported by substantial evidence. (Opinion, p. 31.) To that end, the Opinion upholds mitigation measures for parking, noise and vibration, safety, and construction impacts that commit respondent Exposition Metro Line Construction Authority ("Expo Authority") and Metro to achieving specific performance standards and to providing reasonable assurance that the mitigation measures will be effective. (Opinion, pp. 31-40.)

<sup>2</sup> See e.g., Clover Valley Foundation v. City of Rocklin (2011) 197 Cal.App.4th 200, 236; Oakland Heritage v. City of Oakland (2011) 195 Cal.App.4th 884, 906-910 (Oakland Heritage); Communities for a Better Environment (2010) 184 Cal.App.4th 70, 93-96; California Native Plant Society v. City of Rancho Cordova (2009) 172 Cal.App.4th 603, 621-623; Gray v. County of Madera (2008) 167 Cal.App.4th 1099, 1119-1120 (Gray); see also Defend the Bay v. City of Irvine (2004) 119 Cal.App.4th 1261, 1275; Sacramento Old City Assn. v. City Council (1991) 229 Cal.Ap.3dh 1011, 1028.

<sup>3</sup> For example, in *Oakland Heritage, supra*, the First District Court of Appeal found the City of Oakland had not impermissibly deferred formulation of mitigation measures to reduce a project's seismic impacts where the EIR included a very detailed description of the statutes and regulations that would apply to the project to reduce potential seismic and other geologic hazards. (195 Cal.App.4th at pp. 907-908.) Although the court did not hold that an in-depth discussion of the regulatory standards was *necessary* in order to justify an EIR's conclusions that reliance on specified performance standards would reduce impacts to lessthan-significant, Metro understands that since the *Oakland Heritage* opinion was issued, project opponents have cited that opinion for the proposition that mitigation measures need to include very detailed information regarding the performance standards that will be achieved if the project is to rely on those mitigation measures to reduce impacts to less than significant.
#### May 7, 2012 Page 4

In so holding, the Opinion makes clear that the fact that implementing the mitigation measures will involve cooperating with other jurisdictions does not, in itself, mean the mitigation measures are too uncertain for the purposes of concluding impacts are less than significant. (Opinion, pp. 31-38; see esp. Opinion, pp. 37-38 [safety mitigation measures requiring coordination with cities to update emergency response procedures], pp. 39-40 [construction mitigation measures requiring formulation of construction traffic plans in cooperation with affected cities].) This aspect of the Opinion is especially relevant to agencies approving regional projects that could affect multiple jurisdictions and provides some assurance that requiring cooperation between agencies, in addition to requiring other measures to reduce impacts, may be an effective means to reduce impacts under CEQA.

Further, the Opinion clarifies that mitigation measures need not *eliminate* an impact altogether, they simply must *minimize* the impact to below the significance levels set forth in an EIR. (Opinion p. 37.) In so clarifying, the Opinion is careful to explain that *Gray*, *supra*, 167 Cal.App.4th at pp. 1117-1118 did not hold that mitigation measures must restore affected residents to the position to which they are currently accustomed; rather mitigation measures must simply minimize impacts to less than significant. (Opinion, p. 37.) The Opinion's reasoning in this regard, and with respect to mitigation measures generally, elaborates upon and clarifies CEQA's rules regarding the purpose of mitigation measures and the level of detail to include in the measures and should be published for this reason. (Cal. Rules of Court, Rule 8.1105, subd. (c)(3), (4).)

# 3. The Opinion's discussion of the reasonable range of alternatives merits publication.

The Opinion furthers an understanding of the CEQA principle that requires an EIR to describe a range of reasonable alternatives to a project by clarifying the extent to which an agency is required to consider additional alternatives recommended by project opponents. (Opinion, pp. 40-42, § 7.) Specifically, petitioner in this case claimed the EIR was inadequate because it did not consider an alternative with a grade separation in the segment of the light rail line from Overland Avenue to Sepulveda Boulevard. The EIR had explained why grade separation at this segment was not necessary to mitigate significant impacts, and, indeed would cause other environmental impacts. The EIR also explained that grade separation would substantially increase costs and was not necessary under Metro's policy guidance for evaluating grade crossings relative to safety, traffic, and other considerations. The court held that CEQA did not require the EIR to evaluate a grade-separated alternative. In so holding, the court squarely and properly placed the burden on petitioner to show that detailed consideration of such an alternative might have offered substantial environmental benefits over the proposed project. Because petitioner failed to meet this burden, the court held the range of alternatives evaluated in the EIR was adequate. (Opinion, p. 42.) In this respect, the Opinion provides important guidance regarding the burden of proof in litigation with respect to the range of alternatives evaluated in an EIR as well as the need to tie proposed alternatives with substantial environmental benefits and therefore warrants publication. (Cal. Rules of Court, Rule 8.1105, subds. (c)(3), (4).)

# 4. The Opinion explains an existing rule of law regarding CEQA's standards governing recirculation of an EIR, an issue of continuing public interest.

The Opinion also gives meaningful and well-reasoned guidance regarding Public Resources Code section 21092.1, and the California Supreme Court's holding in Laurel Heights Improvement Assn. v. Regents of University of California (1993) 6 Cal,4th 1112, regarding the circumstances under which an agency is required to recirculate a draft EIR for further public review and comment. (Opinion, pp. 42-48, § 8.) Significantly, the Opinion makes it very clear that recirculation is only required when a new significant or substantially more severe environmental impact is identified; recirculation is not required to allow further public comment on new studies prepared for the project in response to public comments, where new mitigation measures are added to the EIR, or where impacts may be worse than originally disclosed in the EIR, but not so much worse that the impact exceeds the thresholds of significance set forth in the EIR. (Opinion, pp. 44-48.) The Opinion's holding and reasoning in this respect is particularly applicable for agencies conducting environmental review of large projects that require considerable responses to comments and refinement over the CEQA process. The Opinion gives clear and helpful guidance about the scope of the information that may be added to an EIR without triggering the duty to recirculate.

# 5. The Opinion clarifies and explains the level of detail necessary in a cumulative impact analysis that uses the "summary of projections" approach to analyzing such impacts.

Lastly, the Opinion includes an important discussion on CEQA's requirements regarding cumulative impact analyses. (Opinion, pp. 26-30, § 5.) The CEQA Guidelines provide that a cumulative impact analysis may be based on either a "list of past, present, and probable future projects producing related or

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cumulative impacts" or a "summary of projections contained in an adopted local, regional, or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect." (CEQA Guidelines, § 15130, subd. (b)(1).) The EIR in this case used a combination of both. (Opinion, p. 27.)

The petitioner argued the EIR did not adequately account for a nearby proposed commercial and residential project, the Casden Project, in analyzing the project's cumulative traffic impacts. The EIR identified the Casden Project along with many others in its "List of Recent Projects Included in the Cumulative Assessment," but no application for the Casden Project had been filed when the draft EIR was circulated. The court found that on this basis alone, the Expo Authority was arguably not required to consider the Casden Project in its cumulative impact analysis. (Opinion p. 28.)

More importantly, the court found the EIR's analysis of project impacts included traffic conditions in 2030 with and without the project, relying on projections in the Southern California Association of Governments' (SCAG's) Regional Transportation Plan, Metro's long-range plan, and the general plans for relevant municipalities. Consequently, traffic increases and intersection delays based on those plans were taken into account, albeit in a more generalized way than petitioner would prefer. The Opinion is careful to note that there is no requirement for a "microanalysis" of impacts as they may be affected by a particular intersection by a particular project where an agency has used the "summary of projections" approach. Indeed, the Opinion notes, the CEQA Guidelines instruct that the discussion of cumulative impacts "shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness ....." (CEQA Guidelines, § 15130, subd. (b).) The court found that standard had been met here.

In so holding, the Opinion provides helpful guidance to both trial courts and public agencies regarding the level of specificity an EIR needs to include when it uses the "summary of projects" approach to cumulative impact analyses. Notably, no other published opinion specifically addresses the level of detail necessary in an EIR's cumulative impact analysis based on the summary of projections approach and the Opinion warrants publication on this basis. (Cal. Rules of Court, Rule 8.1105, subds. (c)(3), (4).)

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#### 6. Conclusion

The currently unpublished portions of the Opinion meet several of the standards for publication set forth in California Rules of Court, Rule 8.1105, subdivision (c). As explained above, the unpublished portions of the Opinion address numerous important issues in a clear, careful, and reasoned manner. Therefore, the Opinion would make a significant contribution to the legal literature and would provide useful guidance to agencies seeking to comply with CEQA, litigants, and trial courts.

Very truly yours,

JOHN F. KRATTLI Acting County Counsel

By Ronald W: Stamm

RONALD W. STAMM Principal Deputy County Counsel Transportation Division

RWS

#### HOA.883547.1

Neighbors for Smart Rail v. Exposition Metro Line Construction Authority, et al. Second District Court of Appeal, Division Eight, Case No. B232655 (Los Angeles County Superior Court Case No. BS125233)

#### PROOF OF SERVICE

I am a citizen of the United States, employed in the City and County of Los Angeles. My business address is One Gateway Plaza, 24<sup>th</sup> Floor, Los Angeles, California 90012. I am over the age of 18 years and not a party to the above-entitled action.

I am familiar with the Los Angeles County Metropolitan Transportation Authority's practice whereby the mail is sealed, given the appropriate postage and placed in a designated mail collection area. Each day's mail is collected and deposited in a U.S. mailbox after the close of each day's business.

On March 7, 2012, I served the following:

# Letter from Court re: Request for Oral Argument

- $\checkmark$  On the parties in this action by causing a true copy thereof to be placed in a sealed envelope with postage thereon fully prepaid in the designated area for outgoing mail addressed as follows; or
- On the parties in this action by causing a true copy thereof to be delivered via Federal Express to the following person(s) or their representative at the address(es) listed below; or
- On the parties in this action by causing a true copy thereof to be electronically delivered via the internet to the following person(s) or representative at the address(es) listed below:

## SEE ATTACHED SERVICE LIST

I declare under penalty of perjury that the foregoing is true and correct and that this Proof of Service was executed this 7th day of March, 2012, at Los Angeles, California.

Sundra Donzaler

Neighbors for Smart Rail v. Exposition Metro Line Construction Authority, et al. Second District Court of Appeal, Division Eight, Case No. B232655 (Los Angeles County Superior Court Case No. BS125233)

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VIA U.S. Mail

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# **EXHIBIT C**

Filed 5/9/12

# **CERTIFIED FOR PARTIAL PUBLICATION**

## IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA

## SECOND APPELLATE DISTRICT

### **DIVISION EIGHT**

NEIGHBORS FOR SMART RAIL,

Plaintiff and Appellant,

v.

**EXPOSITION METRO LINE** CONSTRUCTION AUTHORITY et al.,

Defendants and Respondents;

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY et al.,

Real Parties in Interest.

# THE COURT:

The opinion in the above-entitled matter filed on April 17, 2012, was certified for partial publication. For good cause, publication is modified to include parts 5 through 8 of the opinion. Thus, the note at the bottom of page one of the opinion is modified to now read:

Pursuant to California Rules of Court, rules 8.1100 and 8.1110, this opinion is certified for publication with the exception of parts 3 and 4 of the Discussion.

There is no change in the judgment.

\* BIGELOW, P. J.

FLIER, J.

GRIMES, J.

B232655

(Los Angeles County Super. Ct. No. BS125233)

# **ORDER MODIFYING OPINION** FOR PARTIAL PUBLICATION

[NO CHANGE IN JUDGMENT]

# STATE OF CALIFORNIA, COUNTY OF LOS ANGELES

At the time of service, I was over 18 years of age and **not a** party to this action. I am employed in the County of Los Angeles, State of California. My business address is 2049 Century Park East, Suite 2700, Los Angeles, California 90067.

On May 25, 2012, I served true copies of the following document described as **PETITION FOR REVIEW** on the interested parties in this action as follows:

# SEE ATTACHED SERVICE LIST

X BY MAIL: I enclosed the document(s) in a sealed envelope or package addressed to the persons at the addresses listed in the Service List and placed the envelope for collection and mailing, following our ordinary business practices. I am readily familiar with Elkins Kalt Weintraub Reuben Gartside LLP's practice for collecting and processing correspondence for mailing. On the same day that the correspondence is placed for collection and mailing, it is deposited in the ordinary course of business with the United States Postal Service, in a sealed envelope with postage fully prepaid.

**BY OVERNIGHT DELIVERY:** I enclosed said document(s) in an envelope or package provided by the overnight service carrier and addressed to the persons at the addresses listed in the Service List. I placed the envelope or package for collection and overnight delivery at an office or a regularly utilized drop box of the overnight service carrier or delivered such document(s) to a courier or driver authorized by the overnight service carrier to receive documents.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on May 25, 2012, at Los Angeles, California.

Cheryl Pickens

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Hon. Thomas I. McKnew, Jr. Department SE H c/o Clerk of Court Los Angeles Superior Court 12720 Norwalk Blvd. Norwalk, CA 90650

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NATURAL RESOURCES DEFENSE COUNCIL

Via Email (eircomment.conventionstadium@lacity.org) and U.S. Mail

May 21, 2012

Case # ENV 2011-0585-EIR Environmental Analysis Unit Department of City Planning 200 North Spring Street, City Hall, Room 750 Los Angeles, CA 90012

# Re: Comments on Convention and Event Center Project Draft Environmental Impact Report (DEIR), State Clearinghouse No. 2011031049

Dear Environmental Analysis Unit:

On behalf of the Natural Resources Defense Council (NRDC) and its members and activists who live and work in the City of Los Angeles and the surrounding areas, we provide the following comments on the Draft Environmental Impact Report (DEIR) for the proposed Convention and Event Center project, also referred to as the Farmers Field stadium project (the "Project").

NRDC has closely followed the development of the Project and hopes that it will be successful as the greenest and most transit-friendly in the country, and will be in compliance with the letter and spirit of Senate Bill 292 as well as the public commitments that AEG, the Project's sponsor, has made to the Clinton Climate Initiative. However, we are disappointed that the DEIR does not include any analysis of measures that could lead to the project achieving carbon neutrality or fewer people driving their cars to and from the stadium (trip ratio), as SB 292 requires; nor does it include many of the measures in AEG's promises to the Clinton Initiative. We also have concerns about air quality, health risk, green construction practices and sustainability relating to the Project.

# SB 292 and CEQA

The California Environmental Quality Act (CEQA) requires that the environmental effects of a project be analyzed and that all reasonably feasible mitigation be implemented. SB 292 did not weaken CEQA or make any changes in what must be analyzed in an EIR. Nor did SB 292 make any changes in the general rule that mitigation measures must be enforceable.

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> Here, while the DEIR includes a list of transportation-related measures that might affect the transportation mode shift and carbon neutrality of the Project, there is no analysis of the actual or potential effectiveness of those measures. Nor is there any commitment that the project proponent, AEG, will put any of these measures in place. These failures are inconsistent with CEQA and with SB 292.

> Under the provisions of SB 292, which became law in 2011 and is now codified as Section 21168.6.5 of the Public Resources Code, AEG received the benefit of an expedited judicial review process for any challenge to the Project's EIR in return for promising carbon neutrality and mode shift greater than any other U.S. football stadium. Specifically, subsection (h) of SB 292 provides as follows:

It is the intent of the Legislature that the *project* minimize traffic congestion and air quality impacts that may result from private automobile trips to the stadium through the requirements of this division as supplemented, pursuant to subdivision (i), by the implementation of measures that will do both of the following:

- Achieve and maintain carbon neutrality by reducing to zero the net emissions of greenhouse gases, as defined in subdivision (g) of Section 38505 of the Health and Safety Code, from private automobile trips to the stadium.
- (2) Achieve and maintain a trip ratio that is no more than 90 percent of the trip ratio at any other stadium serving a team in the National Football League. (emphasis added)

The bill's use of the word "project" was intentional and is highly relevant here. Under CEQA, an EIR must review a "project," and it is well established that the project is the "whole of an action." Guidelines § 15378(a) (definition of "project"). Because the bill clearly describes these measures as features *of the project*, failing to include them in the draft EIR is a violation of CEQA as amended by SB 292.

This analysis is reinforced by the language in subsection (i)(1) of the bill:

As a condition of approval of the *project* subject to this section, the lead agency shall require the applicant to implement measures that will meet the requirements of this division and paragraph (1) of subdivision (h) by the end of the first season during which a National Football League team has played at the stadium. (emphasis added)

The key term "project" is used again here. More importantly, this language makes it clear that these measures must be included in the City Council's action approving the project, which is expected to occur at the same time the final EIR is certified. The reference in subsection (i)(1) to "this Division" refers to Division 13

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of the Public Resources Code, entitled "Environmental Quality," and includes all of CEQA. Thus, as a condition of project approval, the DEIR must tell the public and the City what the mode shift and carbon neutrality provisions are, how effective they will be, and how they will be enforced. SB 292 does not eliminate or change these CEQA requirements.

In particular, the DEIR should analyze the benefits to air quality and GHG emissions from a reasonable range of options, including:

- Ticket bundling and/or season ticket options for access. Given that the • majority of teams in the NFL sell out most of their games to season ticket holders, providing options for these patrons in a controlled format that is part of the purchase of season tickets can provide valued patrons with options that save money, enhance the guest experience of the event, or both. For example, instead of selling "parking passes" along with season seats, season ticketholders to Los Angeles NFL football would be provided a series of choices as part of a philosophy of "it's your money, it's your experience." A subscriber would pay for season parking but receive a debit card instead of parking passes. The debit card would be able to be used on public transit, special event shuttle/transit, or even on premium event transport that provides special programming (*i.e.*, a former NFL player or coach discussing the upcoming game with riders). The card would also be accepted at stadium sanctioned souvenir and concession shops, etc. This is the most "market-based" and seemingly passive approach; however, given the expense involved in attending an NFL game coupled with having several choices on how one spends their own money to access the event could prove to be a powerful incentive to people to make different access choices for different games/events.
- Park and ride (Hollywood Bowl style, per bus at capacity). Mode split at the Bowl is approximately 30%.
- Metro buses and other regional bus lines (*e.g.*, the Big Blue Bus) at capacity, assuming that a game-day suitable schedule can be worked out.<sup>1</sup>
- Metro Rail at capacity, assuming that a game-day suitable schedule can be worked out.
- Subway at capacity, assuming that a game-day suitable schedule can be worked out.

<sup>&</sup>lt;sup>1</sup> Current night and weekend schedules for Metro buses, Metro Rail, Metrolink, DASH and many regional bus operations are unlikely to be able to handle crowds at a Farmers Field event, and so these schedules would need to be modified. The DEIR should identify the cost and other issues associated with this.

- Metrolink at capacity, assuming that a game-day suitable schedule can be worked out.
- Charter buses.
- Shuttles or DASH buses to take people from Union Station to the stadium, assuming that a game-day suitable schedule can be worked out.
- Timing of transfers from Union Station to Metro Rail, buses or the DASH to the stadium.
- Bicycle use.
- Walking.
- Ridesharing.

CEQA also requires disclosure of AEG's backup for the estimates in the DEIR for initial mode use for transit, walking and biking, as well as any plans AEG has to disseminate public transit and ridesharing information to the public. Considerable skepticism was expressed at the May 16, 2012 public hearing on the DEIR as to whether AEG's estimates of transit ridership at other stadiums were accurate or relevant.

With respect to carbon offsets, CEQA requires disclosure of AEG's specific plans, to the extent there are any, for carbon offsets in the Pico-Union neighborhood and in the South Coast air basin in general. Any offsets used to comply with SB 292 should be verified in the same way that cap and trade offsets are verified pursuant to AB 32. *See* Cal. Health and Safety Code § 38560(d);<sup>2</sup> see also 17 Cal. Code Regs. § 95977 (requirement for third-party verification of offsets).

These same data are required whether the carbon neutrality and mode shift measures are viewed as mitigation measures or features of the Project. These

<sup>&</sup>lt;sup>2</sup> Section 38560(d) provides in part as to greenhouse gas reductions, including offsets: "(1) The greenhouse gas emission reductions achieved are real, permanent, quantifiable, verifiable, and enforceable by the state board. (2) For regulations pursuant to Part 5 (commencing with Section 38570), the reduction is in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur. 3) If applicable, the greenhouse gas emission reduction occurs over the same time period and is equivalent in amount to any direct emission reduction required pursuant to this division." *See also* Section 38505(k), stating that offsets must "result in the same greenhouse gas emission reduction, over the same time period, as direct compliance with a greenhouse gas emission limit or emission reduction measure adopted by the state board."

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measures are certainly feasible<sup>3</sup> since AEG agreed to carry them out to meet the targets in SB 292. Moreover, common sense tells us that these could be important mitigation measures to reduce the Project's significant and allegedly unavoidable impacts on air quality and public health locally and regionally. *See* Sec. IV.F, 1-81–1-82. But the DEIR does not undertake this analysis, in violation of CEQA. *See* Guidelines § 15126.4(a); *see also Communities For A Better Environment v. City of Richmond*, 184 Cal. App. 4<sup>th</sup> 70, 92 (2010) ("Formulation of mitigation measures should not be deferred until some future time." (Guidelines, § 15126.4(a)(1)(b).) An EIR is inadequate if "[t]he success or failure of mitigation efforts ... may largely depend upon management plans that have not yet been formulated, and have not been subject to analysis and review within the EIR.").

# The Clinton Global Initiative

AEG made a number of significant public promises to the Clinton Global Initiative about the environmental benefits of the Project<sup>4</sup> and has been publicly praised for these promises by President Clinton<sup>5</sup>. Unfortunately, many of these commitments do not appear in the DEIR.

Below, in italics, are the commitments that AEG made to the Clinton Global Initiative and a discussion of their treatment (if any) in the DEIR.

AEG Commitment to Clinton Global Initiative: This commitment expands in detail and scope upon an existing commitment made by AEG to make Farmers Field Stadium carbon neutral in terms of fan transportation. AEG also committed to make Farmers Field Stadium the best in the NFL in terms of highest percent of non-auto fan travel to venue. This commitment also addresses the design, construction, and operations of the venue.

There are no enforceable measures in the DEIR concerning carbon neutrality or percentage of non-auto fan travel.

<sup>&</sup>lt;sup>3</sup> CEQA Guidelines 15364 defines "feasible" as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors."

<sup>&</sup>lt;sup>4</sup> The Clinton Global Initiative website is:

<sup>&</sup>lt;u>http://www.clintonglobalinitiative.org/commitments/default.asp</u>. AEG's commitments about the Project may be found by entering "AEG" into the Commitment Maker / Partner search box on this page:

<sup>&</sup>lt;u>http://www.clintonglobalinitiative.org/commitments/commitments\_search.asp?Section=Commitments</u>.

<sup>&</sup>lt;sup>5</sup> See <u>http://greeninghollywood.wordpress.com/2011/09/21/clinton-global-initiative-recognizes-aeg-farmers-field/</u>

AEG Commitment to Clinton Global Initiative: 100 percent climate neutral for greenhouse gas emissions from energy consumption and mechanical operations of the stadium

Farmers Field will achieve climate neutrality through the installation of best available technology for HVAC, lighting, and all major electrical appliances and control systems; through on-site generation of clean and renewable energy; through the purchase of renewable energy credits and through educating employees on energy efficiency through their Environmental Management system. Special projects under analysis include: additional solar panels on garages, 100% LED lighting throughout building, and a Carbon Offset Ticket.

There is no analysis in the DEIR of how carbon neutrality will be accomplished. Indeed, the DEIR asserts that no mitigation is required with respect to the effects of the project on climate change. IV.F.2-53.

AEG Commitment to Clinton Global Initiative: Recycling and Waste Diversion

- 90 percent solid waste diverted during construction

- 75 percent generated during operation

Farmers Field will divert waste from landfill through a robust recycling, the donation of durable goods, and implementing a front of house composting program that includes sourcing biodegradable concessions packaging.

The DEIR only promises 50 percent diversion of solid waste during operation and 50-75% during construction.

AEG Commitment to Clinton Global Initiative: 100 percent Carbon Neutral for greenhouse gas emissions from private automobile trips to stadium

*Best in NFL by 10% in terms of trip ratio of fans to private automobiles* 

There are no enforceable commitments in the DEIR for either of these promises.

AEG Commitment to Clinton Global Initiative: Education

Farmers Field and L.A. LIVE will feature educational environmental signage and messaging throughout venues and event scoreboards.

There are no enforceable commitments in the DEIR relating to AEG's educational environmental signage policy.

# **Green Construction**

All of the mitigation measures designed to reduce the air pollution from construction of the project discussed in the DEIR are strong measures that will effectively reduce emissions. *See* DEIR at IV.F.1-73–74. We support all of the discussed mitigation measures. However, there are more feasible and effective mitigation measures that also must be included.

First, while Mitigation Measure F.1-3 requires "trucks and vehicles in loading and unloading queues" to "have their engines turned off after 5 minutes when not in use" (*see* DEIR at IV.F.1-73), there must also be idling limits to 5 minutes or less for trucks and vehicles that are not just in loading and unloading queues and also for construction equipment.

Second, trucks and equipment hauling material such as debris or any fill material operating at the project site or traveling to and from the Project site must be fully covered.

Third, while the DEIR includes mitigation measures requiring the use of cleaner construction equipment, the DEIR does not include any mitigation measures requiring the use of cleaner heavy-duty trucks, despite the fact that, similar to construction equipment, heavy-duty trucks operating at the site and traveling to and from the site will run predominantly on diesel fuel and emit harmful emissions, including diesel particulate matter. To mitigate the air emissions from heavy-duty trucks, the following mitigation measures must be included:

Prior to December 31, 2012, all on-road heavy-duty diesel trucks with a gross vehicle weight rating ("GVWR") of 19,500 pounds or greater shall meet or exceed the EPA 2007 on-road emission standards for particulate matter ("PM") (0.01 g/bhp-hr); or shall be equipped with a California Air Resources Board ("CARB") verified Level 3 diesel particulate filter.

From January 1, 2014 and onwards, all on-road heavy-duty diesel trucks with a GVWR of 19,500 pounds or greater shall comply with U.S. Environmental Protection Agency ("EPA") 2007 on-road

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emission standards for PM and NOx (0.01 g/bhp-hr and at least 1.2 g/bhp-hr, respectively).

### Sustainability

In the DEIR, AEG promises 35% water reduction, 14% energy performance improvement, 50% solid waste diverted during operation, 12 electric vehicle charging stations, 250 bicycle spaces, and a solar array system in the LA Live Way Garage. Similar promises were made to the Clinton Global Initiative. However, the details of these proposals are unclear or missing and we believe that more can and must be done. Below we list measures that other venues have put in place (including at the Portland Rose Garden, which is operated by AEG) that AEG can and must implement here.

*Clean Energy*: AEG has not made a commitment to use only renewable/clean energy. Portland's Rose Garden gets 100% of its electricity from renewable sources.

Lincoln Financial Field in Philadelphia plans to build 11,000 solar panels and 14 micro wind-turbines combined with a dual-fuel cogeneration plant that uses heat, biodiesel and natural gas to serve all energy needs and sell energy back to the grid. Currently, they buy 100% of their electricity from renewable sources (14 million kWh in wind energy credits annually from NativeEnergy), and have an onsite solar energy system at their NovaCare Complex training facility that generates 16,000 kWh per year. Eagles' employees also receive incentives to switch from conventional power to wind energy at home.

In 2011 Century Link Field in Seattle installed a 3,750-panel solar array that spans 2.5 acres of the event center's roof. The system is projected to produce 830,000 kWh annually. The panels use cutting-edge thin-film technology that capture both direct and reflected sunlight across a 360-degree cylinder surface, taking advantage of the event center's reflective roofing material.

NASCAR's Pocono Raceway in Long Pond, Pennsylvania installed a 25acre solar farm with a 3-MW system, providing electricity for the entire raceway facility and 1000 homes nearby—between 3 to 4 million kWh per year. This installation, operating since August 2010, is currently the largest solar installation at a major US sports venue and the first that powers a major US sports facility entirely by on-site renewable energy.

The Kaohsiung World Stadium in Taiwan is the first stadium in the world to be 100% powered by solar. Completed in 2011, the stadium's 8,844-panel PV array generates an estimated 1.14 million kWh per year, much of which is sent back to the local grid to power nearby communities.

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> The Philadelphia Phillies have been a member of EPA's Green Power Partnership since 2008, and have purchased 20 million kilowatt-hours of Green-e certified renewable energy credits (RECs) to cover 100% of their energy needs over the last five years.

> The Cleveland Indians installed an innovative helical wind micro-turbine in March piloting a new wind technology in partnership with Cleveland State University's Fenn College of Engineering, estimated to produce 40,000 kWh annually. The Indians also have a 42-panel solar photovoltaic (PV) array that produces 10,000 kWh each year.

> *Diversion of waste during operation*: AEG states in the DEIR that it will divert 50% of waste during operations; AEG promised the Clinton Initiative that it would divert 75% of such waste.

- The San Francisco Giants at AT&T Park divert over 85% of their waste for recycling and composting.
- The Seattle Mariners currently divert over 81% of their waste for recycling and composting. Much of their success has resulted from eliminating most items that cannot be recycled and composted from their procurement altogether—a strategy that they hope will result in a 90% + diversion rate this year.
- Century Link Field diverted 70% of its waste for recycling and composting in 2011, and aims to divert 80% in 2012–2013.
- The Rose Garden diverts 60% of its waste from landfills through its recycling and composting programs, totaling over 800 tons annually.
- Lincoln Financial Field diverts 65% of the stadium's waste from landfills as of 2012.
- Australia's ANZ Stadium has a 100% closed-loop recycling program where all trash is collected and separated for recycling. All of their products are made from recycled materials and can be recycled themselves.

*Composting*: AEG has only promised front of house (attendees, voluntary) composting but not back of house (staff) composting. Colorado Convention Center provides for both. Lincoln Financial Field even composts its grass cuttings and recycles the oil from their kitchens and vendors for biodiesel. Safeco Field, Century Link Field, and AT&T Park have comprehensive front and back of house composting programs that contribute significantly to their high diversion rates. The San Diego Padres have partnered with Buster Biofuels to provide biodiesel fuel for local school buses by recycling oil and grease from concessions at the ballpark.

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*Construction*: AEG's construction will use a minimum of 20% recycled materials and 5% fast growing materials. Other stadia have exceeded this rate:

- Citi Field contains 12,500 tons of structural steel, about 95 percent of which is recycled. The stadium also has 65,000 square feet of porous pavers and a large drainage bed near the commuter bus parking lot to reduce storm water runoff. It has metered hands-free faucets, toilet flush-o-meters and waterless urinals, which conserve millions of gallons of water each year.
- The Miami Marlins' LEED Silver construction of Marlins Park incorporated over 40% of pre- and post-consumer recycled materials. They also sourced 51% of their construction materials from sources within 500 miles of the stadium site.

During construction of MetLife Stadium in New York, all equipment ran on low-sulfur diesel fuel and had filters to reduce emissions. The stadium includes structural steel and rebar made from 24,280 tons of scrap. Its 8,000 piles were also made from scrap. About 10 percent of the exterior aluminum wall slats contain recycled material, and general seating is made of 20 percent post-consumer plastics.

Ford Field used 20 million pounds of recycled steel, recycled glass floors, recycled rubber for parking lots, and bamboo for floors and elevators. New Meadowlands Stadium has seats made from partially-recycled plastic and scrap iron. New England Patriots took crushed old stadium concrete and reused it for parking lots. Some stadia have used PEFC-certified timber. *See* Green Sports Alliance, London Olympic Park Awarded FSC Certification, <u>http://www.greensportsalliance.org/news-feed/london-olympic-park-awarded-fsc-certification</u> (last visited May 18, 2012).

*Green Roofs*: Farmers Field will have a retractable roof, but the new convention center can have a green roof. Washington, D.C.'s Nationals Ballpark (6,300 square feet) and Prince's Park Stadium in the United Kingdom have green roofs, as will the new Santa Clara Stadium near San Francisco (opening in 2014). The 2.5-acre green roof atop the Target Center, home to the Minnesota Timberwolves, captures about a million gallons of stormwater per year, saving \$10,000 annually in stormwater charges. The New York Mets' administration building at Citi Field features a 15,000-square foot green roof.

*Construction waste*: The Farmers Field Stadium has committed to recycling 50–75% of all construction waste. AEG promised the Clinton Initiative that it would recycle 90%. In comparison, the Rose Garden in 1995 recycled more than half of its construction waste, amounting to nearly 36,000 tons. *See* <u>http://infohouse.p2ric.org/ref/26/25329.pdf</u>. The Miami Marlins' LEED Silver construction of Marlins Park diverted 98% of all construction wastes from landfills

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to recycling facilities.

*Event Center Food*: AEG does not discuss this issue in the DEIR. The Rose Garden provides a line of locally produced food and beverages and has 95% compostable/100% recycled food and beverage containers. The current Los Angeles Convention Center has a 100% environmentally friendly approach to food: biodegradable or composted service ware, a food waste diversion program, and a sustainable menu with 100% free range organic grass-fed beef and sustainable seafood. Lincoln Financial Field uses corn-based cups that can biodegrade in 50 days as well as corn-plastic dishes/utensils. Safeco Field uses compostable food and service ware specified by their composting hauler, and offers local and organic food and beverages.

At the new Yankee stadium, management uses biodegradable beverage cups; it also composts material — including grass clippings from the outfield reducing trash hauled to landfills by 40 percent. After each homestand, the stadium donates boxes of unused food through a program called Rock and Wrap It Up. Management also recycles the waste cooking oil from the stadium — 20,000 gallons last year was converted to 18,000 gallons of biodiesel fuel.

*Electronic Ticketing/Recycled Paper*: AEG has made no commitment to use electronic ticketing or print on recycled paper. The Rose Garden provides electronic ticketing. Lincoln Financial Field uses recycled paper for tickets and programs. All Red Sox publications, tickets and print are recycled paper (including media guides, pocket schedules, yearbooks, programs, etc).

*Other Measures*: Lincoln Financial Field's website allows fans to see the actual kilowatt hours from the team's solar panels to promote awareness. At MetLife Stadium, home to the New York Giants and Jets, a "Solar Ring" installation atop the stadium will generate 25 times the power needed to operate the stadium on game days with a 1500-panel solar array. The Eagles buy offsets for the carbon emissions they accumulate while flying across the country and allow ticket holders to purchase renewable energy offsets when purchasing tickets.

The Minnesota Twins earned several LEED points-including an exemplary performance and innovation point-for its comprehensive Green Cleaning program. In 2011, the Twins reduced the usage of chemical cleaning compounds by 66 percent over 2010, using a total of 73 percent of cleaning compounds that met the USGBC's LEED standards. Progressive Field features a solar pavilion with real-time energy generation

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# Local and Regional Air Quality and Health Risk

The DEIR projects significant air quality impacts locally and regionally.

Regional operational emissions would still exceed the SCAQMD daily emission threshold for regional NOX, VOC, PM10 PM2.5, and CO after implementation of feasible mitigation measures. Therefore, operation of the Proposed Project would have a significant and unavoidable impact on regional air quality. Cumulative operational air quality impacts would also remain significant. (IV.F 1-81)

Localized operational emissions would also still exceed their respective state and federal thresholds. Therefore, with respect to localized emissions from operational activities, PM10 and NOX impacts would be significant and unavoidable. (IV.F 1-81)

During Proposed Project operations significant localized PM10 concentration levels would occur in certain areas surrounding the Project Site. (IV.F. 1-82)

The Project-related pollutants that cause these exceedances are overwhelmingly from mobile sources – that is, fans driving to and from the stadium. 95% of the PM2.5, 97% of the SOx and 88% of the NOx from "event days" are from these sources.<sup>6</sup> But instead of reducing the use of mobile sources, the DEIR shows that AEG is facilitating them by, for example, proposing improvements to the Hollywood Freeway and building additional parking structures.

Remarkably, given the predicted air pollution levels,<sup>7</sup> pollution from mobile sources other than trucks using the Project's loading docks is not analyzed in the

<sup>&</sup>lt;sup>6</sup> Table IV.F.1-7 at IV.F.1-41.

<sup>&</sup>lt;sup>7</sup> Actual levels may be greater than analyzed because of the DEIR's failure to consider a scenario or scenarios that involve an NFL stadium event with an overlapping basketball or hockey capacity event at the Staples Center. Since there are two pro basketball and one pro hockey teams based at Staples, and since hockey and basketball seasons overlap all but the first month of the football season and since each of the basketball and hockey teams play upwards of 40 home games, it is not unlikely that such combination events would occur and they actually might be fairly frequent. Combination event scenarios that should have been considered include afternoon basketball or hockey, simultaneous afternoon football with either basketball or hockey and simultaneous evening football with either basketball or hockey. AEG claims that it will be able to coordinate events at Staples Center, the Convention Center and Farmers Field to eliminate such overlap, but does not say

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Health Risk Assessment in the DEIR, making that document essentially worthless as well as in violation of CEQA Guideline 15126.2(a) and *Bakersfield Citizens for Local Control v. City of Bakersfield*, 124 Cal.App.4<sup>th</sup> 1184, 1219-1220 (2004).

It is our understanding that AEG's reason for not including non-diesel emissions in the Health Risk Assessment is that gasoline-driven vehicles would not emit substantive amounts of air toxics. This same reasoning was rejected in *Bakersfield Citizens*, in which an EIR found adverse air quality impacts derived "primarily from automobile emissions during operation and from architectural coatings and construction equipment during construction phase" but those emissions were not analyzed for health risk. The Court of Appeal rejected this approach, explaining:

Guidelines section 15126.2, subdivision (a) requires an EIR to discuss, inter alia, "health and safety problems caused by the physical changes" that the proposed project will precipitate. Both of the EIR's concluded that the projects would have significant and unavoidable adverse impacts on air quality. It is well known that air pollution adversely affects human respiratory health. (See, e.g., Bustillo, Smog Harms Children's Lungs for Life, Study Finds, L.A. Times (Sept. 9, 2004).) Emergency rooms crowded with wheezing sufferers are sad but common sights in the San Joaquin Valley and elsewhere. Air quality indexes are published daily in local newspapers, schools monitor air quality and restrict outdoor play when it is especially poor and the public is warned to limit their activities on days when air quality is particularly bad. Yet, neither EIR acknowledges the health consequences that necessarily result from the identified adverse air quality impacts. Buried in the description of some of the various substances that make up the soup known as "air pollution" are brief references to respiratory illnesses. However, there is no acknowledgement or analysis of the wellknown connection between reduction in air quality and increases in specific respiratory conditions and illnesses. After reading the EIR's, the public would have no idea of the health consequences that result when more pollutants are added to a nonattainment basin. On remand, the health impacts resulting from the adverse air quality impacts must be identified and analyzed in the new EIR's.

It is well-known that non-diesel mobile source air emissions such as ozone and its precursors (NOx, SOx, VOCs) contribute to respiratory and other health problems. *See, e.g., Traffic-related air pollution and asthma in economically disadvantaged and high traffic density neighborhoods in Los Angeles County,* 

how, or what enforcement measures will be in place in the face of resistance by the sports leagues or national television networks.

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California, available at http://www.arb.ca.gov/research/single-

project.php?row id=64715; the California Air Resources Board Children's Health Study, available at http://www.arb.ca.gov/research/chs/chs.htm#new; Gauderman, et al., The Effect of Air Pollution on Lung Development from 10 to 18 Years of Age, 351 N Eng Journal Med 1057-1067 (2004); Health Effects Institute, Traffic-Related Air Pollution: A Critical Review of the Literature on Emissions, Exposure, and *Health Effects* (2010), available at http://pubs.healtheffects.org/view.php?id=334; USEPA Health Effects of Ozone in the General Population, available at http://www.epa.gov/apti/ozonehealth/population.html; USEPA, Health Effects of *Nitrogen Dioxide*, available at http://www.epa.gov/air/nitrogenoxides/health.html; USEPA, Health Effects of Sulfur Dioxide, available at http://www.epa.gov/air/sulfurdioxide/health.html; US EPA, Ozone Health Risk Assessment for Selected Urban Areas (2007), available at http://www.epa.gov/ttnnaags/standards/ozone/data/2007-01 ozone ra final tsd.pdf; US EPA, Risk and Exposure Assessment to Support the Review of the NO2 Primary National Ambient Air Quality Standard (2008), available at http://www.epa.gov/ttn/naaqs/standards/nox/data/20081121 NO2 REA final.pdf; US EPA, Risk and Exposure Assessment to Support the Review of the SO2 Primary National Ambient Air Quality Standards: First Draft (2008), available at http://www.epa.gov/ttnnaaqs/standards/so2/data/2008 06 rea firstdraft.pdf.<sup>8</sup>

Here are the primary results of the Children's Health Study, as reported<sup>9</sup> by CARB, the study's sponsor:

- Air pollution harms children's lungs for life. Children exposed to higher levels of particulate matter, nitrogen dioxide, acid vapor and elemental carbon, had significantly lower lung function at age 18, an age when the lungs are nearly mature and lung function deficits are unlikely to be reversed.
- Children that were exposed to current levels of air pollution had significantly reduced lung growth and development when exposed to higher levels of acid vapor, ozone, nitrogen dioxide and particulate matter which is made up of very small particles that can be breathed deeply into the lungs.

<sup>&</sup>lt;sup>8</sup> See also Delfino, *Repeated hospital encounters for asthma in children and exposure to traffic-related air pollution near the home*, 102 Annals of Allergy, Asthma & Immunology 138-144(February, 2009); Guaderman, *Childhood Asthma and Exposure to Traffic and Nitrogen Dioxide*, 16 Epidemiology 737-743 (2005); Brugge, *Near-highway pollutants in motor vehicle exhaust: A review of epidemiologic evidence of cardiac and pulmonary health risks*, Environmental Health (2007). Copies of these articles are being submitted with this comment letter.

<sup>&</sup>lt;sup>9</sup> See <u>http://www.arb.ca.gov/research/chs/over.htm</u>.

- Children living in high ozone communities who actively participated in several sports were more likely to develop asthma than children in these communities not participating in sports.
- Children living in communities with higher concentrations of nitrogen dioxide, particulate matter, and acid vapor had lungs that both developed and grew more slowly and were less able to move air through them. This decreased lung development may have permanent adverse effects in adulthood.
- Children who moved away from study communities had increased lung development if the new communities had lower particulate matter levels, and had decreased lung development if the new communities had higher particulate matter levels.
- Days with higher ozone levels resulted in significantly higher school absences due to respiratory illness.
- Children with asthma who were exposed to higher concentrations of particulate matter were much more likely to develop bronchitis.

In view of these data and studies, the Health Risk Analysis in the DEIR needs to be re-done to analyze the risk posed by non-diesel emissions from mobile sources associated with the Project.

Moreover, the air pollution effects reported in the DEIR, which will have their greatest impact on the nearby Pico-Union neighborhood, are not unavoidable. For example, the mobile source emissions modeling is based on an assumed<sup>10</sup> 26-mile trip length for fans attending events at the new stadium. That trip length can be substantially lessened, or essentially eliminated, if affordable, efficient public transit and other measures that we have discussed in this letter are put in place. Claiming that failure to analyze such measures is a conservative approach does not mask the fact that the air quality, and health, problems that will be inflicted on the Pico-Union neighborhood and others by the Project can be mitigated.

<sup>&</sup>lt;sup>10</sup> "The DEIR analysis was based on information provided by the Traffic Consultant in which it was assumed 10 miles for worker commute, 8 miles for patrons at the Convention Center, and 26 miles for events at the Event Center. Appendix M-1 at 200.

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> In conclusion, the DEIR needs to be rewritten and then re-circulated when the problems we have identified are fixed. Thank you for considering our comments.

Very truly yours,

David Pettit Senior Attorney Director, Southern California Air Program Damon Nagami Staff Attorney

#### Review

# **Open Access** Near-highway pollutants in motor vehicle exhaust: A review of epidemiologic evidence of cardiac and pulmonary health risks Doug Brugge<sup>\*1</sup>, John L Durant<sup>2</sup> and Christine Rioux<sup>3</sup>

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#### Abstract

There is growing evidence of a distinct set of freshly-emitted air pollutants downwind from major highways, motorways, and freeways that include elevated levels of ultrafine particulates (UFP), black carbon (BC), oxides of nitrogen (NOx), and carbon monoxide (CO). People living or otherwise spending substantial time within about 200 m of highways are exposed to these pollutants more so than persons living at a greater distance, even compared to living on busy urban streets. Evidence of the health hazards of these pollutants arises from studies that assess proximity to highways, actual exposure to the pollutants, or both. Taken as a whole, the health studies show elevated risk for development of asthma and reduced lung function in children who live near major highways. Studies of particulate matter (PM) that show associations with cardiac and pulmonary mortality also appear to indicate increasing risk as smaller geographic areas are studied, suggesting localized sources that likely include major highways. Although less work has tested the association between lung cancer and highways, the existing studies suggest an association as well. While the evidence is substantial for a link between near-highway exposures and adverse health outcomes, considerable work remains to understand the exact nature and magnitude of the risks.

#### Background

Approximately 11% of US households are located within 100 meters of 4-lane highways [estimated using: [1,2]]. While it is clear that automobiles are significant sources of air pollution, the exposure of near-highway residents to pollutants in automobile exhaust has only recently begun to be characterized. There are two main reasons for this: (A) federal and state air monitoring programs are typically set up to measure pollutants at the regional, not local scale; and (B) regional monitoring stations typically do not measure all of the types of pollutants that are elevated next to highways. It is, therefore, critical to ask what is known about near-highway exposures and their possible health consequences.

Here we review studies describing measurement of nearhighway air pollutants, and epidemiologic studies of cardiac and pulmonary outcomes as they relate to exposure to these pollutants and/or proximity to highways. Although some studies suggest that other health impacts are also important (e.g., birth outcomes), we feel that the case for these health effects are less well developed scientifically and do not have the same potential to drive public policy at this time. We did not seek to fully integrate the relevant cellular biology and toxicological literature, except for a few key references, because they are so vast by themselves.

We started with studies that we knew well and also searched the engineering and health literature on Medline. We were able to find some earlier epidemiologic studies based on citations in more recent articles. We include some studies that assessed motor vehicle-related pollutants at central site monitors (i.e., that did not measure highway proximity or traffic) because we feel that they add to the plausibility of the associations seen in other studies. The relative emphasis given to studies was based on our appraisal of the rigor of their methodology and the significance of their findings. We conclude with a summary and with recommendations for policy and further research.

#### Motor vehicle pollution

It is well known that motor vehicle exhaust is a significant source of air pollution. The most widely reported pollutants in vehicular exhaust include carbon monoxide, nitrogen and sulfur oxides, unburned hydrocarbons (from fuel and crankcase oil), particulate matter, polycyclic aromatic hydrocarbons, and other organic compounds that derive from combustion [3-5]. While much attention has focused on the transport and transformation of these pollutants in ambient air - particularly in areas where both ambient pollutant concentrations and human exposures are elevated (e.g., congested city centers, tunnels, and urban canyons created by tall buildings), less attention has been given to measuring pollutants and exposures near heavily-trafficked highways. Several lines of evidence now suggest that steep gradients of certain pollutants exist next to heavily traveled highways and that living within these elevated pollution zones can have detrimental effects on human health.

It should be noted that many different types of highways have been studied, ranging from California "freeways" (defined as multi-lane, high-speed roadways with restricted access) to four-lane (two in each direction), variable-speed roadways with unrestricted access. There is considerable variation in the literature in defining highways and we choose to include studies in our review that used a broad range of definitions (see Table 1).

It should also be noted that there may be significant heterogeneity in the types and amounts of vehicles using highways. The typical vehicle fleet in the US is composed of passenger cars, sports utility vehicles, motorcycles, pickup trucks, vans, buses, and small, medium, and large trucks. The composition and size of a fleet on a given highway may vary depending on the time of day, day of the week, and use restrictions for certain classes of vehicles. Fleets may also vary in the average age and state of repair of vehicles, the fractions of vehicles that burn diesel and gasoline, and the fraction of vehicles that have catalytic converters. These factors will influence the kinds and amounts of pollutants in tailpipe emissions. Similarly, driving conditions, fuel chemistry, and meteorology can also significantly impact emissions rates as well as the kinds and concentrations of pollutants present in the near-highway environment. These factors have rarely been taken into consideration in health outcome studies of near-highway exposure.

Based on our review of the literature, the pollutants that have most consistently been reported at elevated levels near highways include ultrafine particles (UFP), black carbon (BC), nitrogen oxides (NOx), and carbon monoxide (CO). In addition, PM<sub>2.5</sub>, and PM<sub>10</sub> were measured in many of the epidemiologic studies we reviewed. UFP are defined as particles having an aerodynamic diameter in the range of 0.005 to 0.1 microns (um). UFP form by condensation of hot vapors in tailpipe emissions, and can grow in size by coagulation. PM2.5 and PM10 refer to particulate matter with aerodynamic diameters of 2.5 and 10 um, respectively. BC (or "soot carbon") is an impure form of elemental carbon that has a graphite-like structure. It is the major light-absorbing component of combustion aerosols. These various constituents can be measured in real time or near-real time using particle counters (UFP) and analyzers that measure light absorption (BC and CO), chemiluminescence (NOx), and weight (PM<sub>2.5</sub> and PM<sub>10</sub>). Because UFP, NOx, BC, and CO derive from a common source - vehicular emissions - they are typically highly inter-correlated.

#### Air pollutant gradients near highways

Several recent studies have shown that sharp pollutant gradients exist near highways. Shi et al. [6] measured UFP number concentration and size distribution along a roadway-to-urban-background transect in Birmingham (UK), and found that particle number concentrations decreased nearly 5-fold within 30 m of a major roadway (>30,000 veh/d). Similar observations were made by Zhu et al. [7,8] in Los Angeles. Zhu et al. measured wind speed and direction, traffic volume, UFP number concentration and size distribution as well as BC and CO along transects downwind of a highway that is dominated by gasoline vehicles (Freeway 405; 13,900 vehicles per hour; veh/h) and a highway that carries a high percentage of diesel vehicles (Freeway 710; 12,180 veh/h). Relative concentrations of CO, BC, and total particle number concentration decreased exponentially between 17 and 150 m downwind from the highways, while at 300 m UFP number concentrations were the same as at upwind sites. An increase in the relative concentrations of larger particles and concomitant decrease in smaller particles was also observed along the transects (see Figure 1). Similar observations were made by Zhang et al. [9] who demonstrated "road-to-ambient" evolution of particle number distributions near highways 405 and 710 in both winter and sum-

Citation	Location	Highway traffic intensi- ty <sup>a</sup>	Pollutants measured <sup>b</sup>	Observed Pollution Gradients
Shi et al. 1999 (6)	Birmingham, UK	30,000 veh/d	UFP + FP (10-10 <sup>4</sup> nm)	2–100 m <sup>c</sup>
Zhu et al. 2002 (8)	Los Angeles; Freeway 710	12,180 veh/h	UFP, CO, BC	17–300 m <sup>c</sup>
Zhu et al. 2002 (7)	Los Angeles; Freeway 405	13,900 veh/h	UFP, CO, BC	30–300 m <sup>c</sup>
Hitchins et al. 2002 (11)	Brisbane (Austr.)	2,130–3,400 veh/h	UFP + FP (15-2 × 10 <sup>4</sup> nm), PM <sub>2 5</sub>	15–375 m <sup>c</sup>
Fischer et al. 2000 (13)	Amsterdam	<3,000–30,974 veh/d	PM <sub>2 5</sub> , PM <sub>10</sub> , PPAH, VOCs	NA
Roorda-Knape et al. 1998 (14)	Netherlands	80,000-152,000 veh/d	PM <sub>2.5</sub> , PM <sub>10</sub> , BC, VOCs, NO <sub>2</sub>	15–330 m <sup>c</sup>
Janssen et al. 2001 (15)	Netherlands	40,000–170,000 veh/d	$PM_{25}$ , $VOCs$ , $NO_{2}$	< 400 m <sup>c</sup>
Morawska et al. 1999 (12)	Brisbane (Austr.)	NA	UFP	10–210 m <sup>c</sup>

Table I: Sum	mary of nea	r-highway	pollution	gradients
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<sup>a</sup>As defined in article cited (veh/d = vehicles per day; veh/h = vehicles per hour).

<sup>b</sup>UFP = ultrafine particles; FP = fine particles; PM<sub>2.5</sub> = particles with aerodynamic diameter  $\leq$  2.5 um; PM<sub>10</sub> = particles with aerodynamic diameter  $\leq$ 

10 um; BC = black carbon; PPAH = particle-bound polycyclic aromatic hydrocarbons; VOCs = volatile organic compounds

<sup>c</sup>Pollutant measurements were made along a transect away from the highway

NA = not applicable; measurements were not made.

mer. Zhang et al. observed that between 30–90 m downwind of the highways, particles grew larger than 0.01 um due to condensation, while at distances >90 m, there was both continued particle growth (to >0.1 um) as well as particle shrinkage to <0.01 um due to evaporation. Because condensation, evaporation, and dilution alter size distribution and particle composition, freshly-emitted UFP near highways may differ in chemical composition from UFP that has undergone atmospheric transformation during transport to downwind locations [10].

Two studies in Brisbane (Australia) highlight the importance of wind speed and direction as well as contributions of pollutants from nearby roadways in tracking highwaygenerated pollutant gradients. Hitchins et al. [11] measured the mass concentrations of 0.1-10 um particles as well as total particle number concentration and size distribution for 0.015–0.7 um particles near highways (2,130– 3,400 veh/h). Hitchens et al. observed that the distance from highways at which number and mass concentrations decreased by 50% varied from 100 to 375 m depending on the wind speed and direction. Morawska et al. [12] measured the changes in UFP number concentrations along horizontal and vertical transects near highways to distinguish highway and normal street traffic contributions. It was observed that UFP number concentrations were highest <15 m from highways, while 15-200 m from highways there was no significant difference in UFP number concentrations along either horizontal or vertical transects - presumably due to mixing of highway pollutants with emissions from traffic on nearby, local roadways.

In addition to UFP, other pollutants – such as  $PM_{2.5'}$   $PM_{10'}$  NO<sub>2</sub> (nitrogen dioxide), VOCs (volatile organic

compounds), and particle-bound polycyclic aromatic hydrocarbons (PPAH) - have been studied in relation to heavily-trafficked roadways. Fischer et al. [13] measured PM<sub>2.5</sub>, PM<sub>10</sub>, PPAH, and VOC concentrations outside and inside homes on streets with high and low traffic volumes in Amsterdam (<3,000-30,974 veh/d). In this study, PPAH and VOCs were measured using methods based on gas chromatography. Fischer et al. found that while PM<sub>2.5</sub> and PM<sub>10</sub> mass concentrations were not specific indicators of traffic-related air pollution, PPAH and VOC levels were ~2-fold higher both indoor and outdoor in high traffic areas compared to low traffic areas. Roorda-Knape et al [14] measured  $PM_{2.5}$ ,  $PM_{10}$ , black smoke (which is similar to BC), NO<sub>2</sub>, and benzene in residential areas <300 m from highways (80,000-152,000 veh/d) in the Netherlands. Black smoke was measured by a reflectance-based method using filtered particles; benzene was measured using a method based on gas chromatography. Roorda-Knape et al reported that outdoor concentrations of black smoke and NO<sub>2</sub> decreased with distance from highways, while PM2.5, PM10, and benzene concentrations did not change with distance. In addition, Roorda-Knape et al. found that indoor black smoke concentrations were correlated with truck traffic, and NO<sub>2</sub> was correlated with both traffic volume and distance from highways. Janssen et al. [15] studied PM<sub>2.5</sub>, PM<sub>10</sub>, benzene, and black smoke in 24 schools in the Netherlands and found that PM<sub>25</sub> and black smoke increased with truck traffic and decreased with distance from highways (40,000-170,000 veh/d).

In summary, the literature shows that UFP, BC, CO and NOx are elevated near highways (>30,000 veh/d), and that other pollutants including VOCs and PPAHs may also be elevated. Thus, people living within about 30 m of highways are likely to receive much higher exposure to



Distance down wind from the 710 freeway (m)

#### Figure I

Ultrafine particle size distribution (top panel) and normalized particle number concentration for different size ranges (bottom panel) as a function of distance from a highway in Los Angeles. From Zhu et al. (8). Reprinted with permission from Elsevier.

traffic-related air pollutants compared to residents living >200 m (+/-50 m) from highways.

#### Cardiovascular health and traffic-related pollution

Results from clinical, epidemiological, and animal studies are converging to indicate that short-term and long-term exposures to traffic-related pollution, especially particulates, have adverse cardiovascular effects [16-18]. Most of these studies have focused on, and/or demonstrated the strongest associations between cardiovascular health outcomes and particulates by weight or number concentrations [19-21] though CO, SO<sub>2</sub>, NO<sub>2</sub>, and BC have also been examined. BC has been shown to be associated with decreases in heart rate variability (HRV) [22,23] and black smoke and NO<sub>2</sub> shown to be associated with cardiopulmonary mortality [24].

Short-term exposure to fine particulate pollution exacerbates existing pulmonary and cardiovascular disease and long-term repeated exposures increases the risk of cardiovascular disease and death [25,26].

Though not focused on near-highway pollution, two large prospective cohort studies, the Six-Cities Study [27] and the American Cancer Society (ACS) Study [28] provided the groundwork for later research on fine particulates and cardiovascular disease. Both of these studies found associations between increased levels of exposure to ambient PM and sulfate air pollution recorded at central city monitors and annual average mortality from cardiopulmonary disease, which at the time combined cardiovascular and pulmonary disease other than lung cancer. The Six-Cities Study examined PM<sub>2.5</sub> and PM<sub>10/15</sub>. The ACS study examined PM 2.5. Relative risk ratios of mortality from cardiopulmonary disease comparing locations with the highest and lowest fine particle concentrations (which had differences of 24.5 and 18.6 ug/m<sup>3</sup> respectively) were 1.37 (1.11, 1.68) and 1.31 (1.17, 1.46) in the Six Cities and ACS studies, respectively. These analyses controlled for many confounders, including smoking and gas stoves but not other housing conditions or time spent at home. The studies were subject to intensive replication, validation, and reanalysis that confirmed the original findings. PM<sub>25</sub> generally declined following implementation of new US Environmental Protection Agency standards in 1997 [17,29], yet since that time studies have shown elevated health risks due to long-term exposures to the 1997 PM threshold concentrations [29,30].

Much of the epidemiological research has focused on assessing the early physiological responses to short-term fluctuations in air pollution in order to understand how these exposures may alter cardiovascular risk profiles and exacerbate cardiovascular disease [31]. Heart rate variability, a risk factor for future cardiovascular outcomes, is altered by traffic-related pollutants particularly in older people and people with heart disease [22,23,32]. With decreased heart rate variability as the adverse outcome, negative associations between HRV and particulates were strongest for the smallest size fraction studied [33] (PM0.3–1.0); [34] (PM0.02–1). In two studies that included other pollutants, black carbon, an indicator of traffic particles, also elicited a strong association with both time and frequency domain HRV variables; associations were also strong for PM2.5 for both time and frequency HRV variables in the Adar et al study [[23]; this and subsequent near highway studies are summarized in Table 2], however, PM2.5 was not associated with frequency domain variables in the Schwartz et al. study [22].

Several studies show that exposure to PM varies spatially within a city [35-37], and finer spatial analyses show higher risks to individuals living in close proximity to heavily trafficked roads [18,37]. A 2007 paper from the Woman's' Health Initiative used data from 573 PM<sub>2.5</sub> monitors to follow over 65,000 women prospectively. They reported very high hazard ratios for cardiovascular events (1.76; 95% CI, 1.25 to 2.47) possibly due to the fine grain of exposure monitoring [18]. In contrast, studies that relied on central monitors [27,28] or interpolations from central monitors to highways are prone to exposure misclassification because individuals living close to highways will have a higher exposure than the general area. A possible concern with this interpretation is that social gradients may also situate poorer neighborhoods with potentially more susceptible populations closer to highways [38-40].

At a finer grain, Hoek et al. [24] estimated home exposure to nitrogen dioxide (NO<sub>2</sub>) and black smoke for about 5,000 participants in the Netherlands Cohort Study on Diet and Cancer. Modeled exposure took into consideration proximity to freeways and main roads (100 m and 50 m, respectively). Cardiopulmonary mortality was associated with both modeled levels of pollutants and living near a major road with associations less strong for background levels of both pollutants. A case-control study [41], found a 5% increase in acute myocardial infarction associated with living within 100 m of major roadways. A recent analysis of cohort data found that traffic density was a predictor of mortality more so than was ambient air pollution [42]. There is a need for studies that assess exposure at these scales, e.g., immediate vicinity of highways, to test whether cardiac risk increases still more at even smaller scales.

Although we cannot review it in full here, we note that evidence beyond the epidemiological literature support the contention that  $PM_{2.5}$  and UFP (a sub-fraction of  $PM_{2.5}$ ) have adverse cardiovascular effects [16,17].  $PM_{2.5}$  appears

Citation	Location	Highway traffic intensity <sup>a</sup>	Pollutants meas- ured <sup>b</sup>	Distance from highway	Health Outcomes	Statistical associa- tion <sup>e</sup>
Schwartz et al. 2005 (22)	Boston	NA	PM <sub>2.5</sub> , BC, CO	NA	Heart rate variability	Decreases in measures of heart rate variability
Adar et al. 2007 (23)	St. Louis, Missouri	NA	PM <sub>2.5</sub> , BC, UFP	On highway in busses	Heart rate variability	Decreases in measures of heart rate variability
Hoek et al. 2002 (24)	Netherlands	NA	BC, NO <sub>2</sub>	Continuous <sup>d</sup>	Cardio-pulmonary mortality, lung cancer	1.41 OR for living near road
Tonne et al. 2007 (41)	Worchester, Mass.	NA	PM <sub>2.5</sub>	Continuous <sup>d</sup>	Acute myocardial infarction (AMI)	5% increase in odds of AMI
Venn et al. 2001 (49)	Nottingham, UK	NA	NA	Continuous <sup>d</sup>	Wheezing in children	1.08 OR for living w/ in 150 m of road
Nicolai et al. 2003 (58)	Munich, Germany	>30,000 veh/d	Soot, benzene, NO <sub>2</sub>	Traffic counts within 50 m of house	Asthma, respiratory symptoms, allergy	1.79 OR for asthma and high traffic volume
Gauderman et al. 2005 (65)	Southern California		NO <sub>2</sub>	Continuous <sup>d</sup>	Asthma, respiratory symptoms	Increased asthma closer to freeways
McConnell et al. 2006 (57)	Southern California	NA	NA	Continuous <sup>d</sup>	Asthma	Large risk for children living w/in 75 m of road
Ryan, et al. 2007 (59)	Cincinnati, Ohio	> 1,000 trucks/d	PM2.5	<b>400</b> m	Wheezing in children	NA
Kim et al. 2004 (60)	San Francisco	90,000 – 210,000 veh/ d	PM, BC, NO <sub>x</sub>	School sites	Childhood asthma	I.07 OR for high levels of NO <sub>v</sub>
Wjst et al. 1993 (68)	Munich, Germany	7,000–125,000 veh/d	NO <sub>x</sub> , CO	School sites	Asthma, bronchitis	Several statistical associations found
Brunekreef et al. 1997 (69)	Netherlands	80,000 – 152,000 veh/ d	PM <sub>10</sub> , NO <sub>2</sub>	Continuous <sup>d</sup>	Lung function	Decreased FEV with proximity to high truck traffic
Janssen et al. 2003 (74)	Netherlands	30,000–155,000 veh/d	PM <sub>2.5</sub> , NO <sub>2</sub> , benzene	< 400 m <sup>c</sup>	Lung function, respiratory symptoms	No association with lung function
Peters et al. 1999 (82)	Southern California	NA	PM <sub>10</sub> , NO <sub>2</sub>	NA	Asthma, bronchitis, cough, wheeze	1.54 OR of wheeze for boys with exposure to NO <sub>2</sub>
Brauer et al. 2007 (67)	Netherlands	Highways and streets	PM <sub>2.5</sub> , NO <sub>2</sub> , soot	Modeled exposure	Asthma, allergy, bronchitis, respiratory symptoms	Strongest association was with food allergies
Visser et al. 2004 (91)	Amsterdam	> 10,000 veh/d	NA	NA	Cancer	Multiple associations
Vineis et al. 2006 (87)	10 Eurpoean countries	NA	PM <sub>10</sub> , NO <sub>2</sub> , SO <sub>2</sub>	NA	Cancer	1.46 OR near heavy traffic, 1.30 OR for high exposure to NO <sub>2</sub>
Gauderman et al. 2007 (73)	Southern California	NA	PM <sub>10</sub> , NO <sub>2</sub>	Continuous <sup>d</sup>	Lung Function	Decreased FEV for those living near freeway

#### Table 2: Summary of near-highway health effects studies

<sup>a</sup>As defined in article cited (veh/d = vehicles per day; veh/h = vehicles per hour). <sup>b</sup>UFP = ultrafine particles; FP = fine particles; PM<sub>2.5</sub> = particles with aerodynamic diameter  $\leq$  2.5 um; PM<sub>10</sub> = particles with aerodynamic diameter  $\leq$  10 um; BC = black carbon; PPAH = particle-bound polycyclic aromatic hydrocarbons; VOCs = volatile organic compounds

<sup>c</sup>Pollutant measurements were made along a transect away from the highway <sup>d</sup>Proximity of each participant to a major road was calculated using GIS software

eStatistical association between proximity to highway or exposure to traffic-generated pollutants and measured health outcomes

NA = not applicable: measurements were not made

to be a risk factor for cardiovascular disease via mechanisms that likely include pulmonary and systemic inflammation, accelerated atherosclerosis and altered cardiac autonomic function [17,22,43-46]. Uptake of particles or particle constituents in the blood can affect the autonomic control of the heart and circulatory system. Black smoke, a large proportion of which is derived from mobile source emissions [30], has a high pulmonary deposition efficiency, and due to their surface area-to-volume ratios can carry relatively more adsorbed and condensed toxic air pollutants (e.g., PPAH) compared to larger particles [17,47,48]. Based on high particle numbers, high lung deposition efficiency and surface chemistry, UFP may provide a greater potential than PM<sub>2.5</sub> for inducing inflammation [10]. UFPs have high cytotoxic reactive oxygen species (ROS) activity, through which numerous inflammatory responses are induced, compared to other particles [10]. Chronically elevated UFP levels such as those to which residents living near heavily trafficked roadways are likely exposed can lead to long-term or repeated increases in systemic inflammation that promote arteriosclerosis [18,29,34,37].

#### Asthma and highway exposures

Evidence that near highway exposures present elevated risk is relatively well developed with respect to child asthma studies. These studies have evolved over time with the use of different methodologies. Studies that used larger geographic frames and/or overall traffic in the vicinity of the home or school [49-52] or that used self-report of traffic intensity [53] found no association with asthma prevalence. Most recent child asthma studies have, instead, used increasingly narrow definitions of proximity to traffic, including air monitoring or modeling) and have focused on major highways instead of street traffic [54-59]. All of these studies have found statistically significant associations between the prevalence of asthma or wheezing and living very close to high volume vehicle roadways. Confounders considered included housing conditions (pests, pets, gas stoves, water damage), exposure to tobacco smoke, various measures of socioeconomic status (SES), age, sex, and atopy, albeit self-reported and not all in a single study.

Multiple studies have found girls to be at greater risk than boys for asthma resulting from highway exposure [55,57,60]. A recent study also reports elevated risk only for children who moved next to the highway before they were 2 years of age, suggesting that early childhood exposure may be key [57]. The combined evidence suggests that living within 100 meters of major highways is a risk factor, although smaller distances may also result in graded increases in risk. The neglect of wind direction and the absence of air monitoring from some studies are notable missing factors. Additionally, recent concerns have been raised that geocoding (attaching a physical location to addresses) could introduce bias due to inaccuracy in locations [61].

Studies that rely on general area monitoring of ambient pollution and assess regional pollution on a scale orders of magnitude greater than the near-roadway gradients have also found associations between traffic generated pollution (CO and NOx) and prevalence of asthma [62] or hospital admission for asthma [63]. Lweguga-Mukasa et al. [64] monitored air up and down wind of a major motor vehicle bridge complex in Buffalo, NY and found that UFP were higher downwind, dropping off with distance. Their statistical models did not, however, support an association of UFP with asthma. A study in the San Francisco Bay Area measured PM<sub>2.5</sub>, BC and NO<sub>X</sub> over several months next to schools and found both higher pollution levels downwind from highways and a linear association of BC with asthma in long-term residents [60].

Gauderman et al. [65] measured  $NO_2$  next to homes of 208 children. They found an odds ratio (OR) of 1.83 (confidence interval (CI): 1.04–3.22) for outdoor  $NO_2$  (probably a surrogate for total highway pollution) and lifetime diagnosis of asthma. They also found a similar association with distance from residence to freeway. Self-report was used to control for numerous confounders, including tobacco smoke, SES, gas stoves, mildew, water damage, cockroaches and pets which did not substantially affect the association. Gauderman's study suggests that ambient air monitoring at the residence substantially increases sta-

tistical power to detect association of asthma with high-way exposures.

Modeling of elemental carbon attributable to traffic near roadways based on ambient air monitoring of  $PM_{2.5}$  has recently emerged as a viable approach and a study using this method found an association with infant wheezing. The modeled values appear to be better predictors than proximity. Elevation of the residence relative to traffic was also an important factor in this study [66]. A 2007 paper reported on modeled NO<sub>2</sub>, PM<sub>2.5</sub> and soot and the association of these values with asthma and various respiratory symptoms in the Netherlands [67]. While finding modest statistically significant associations for asthma and symptoms, it is somewhat surprising that they found stronger associations for development of sensitization to food allergens.

#### Pediatric lung function and traffic-related air pollution

Studies of association of children's lung function with traffic pollutants have used a variety of measures of exposure, including: traffic density, distance to roadways, area (city) monitors, monitoring at the home or school and personal monitoring. Studies have assessed both chronic effects on lung development and acute effects and have been both cross-sectional and longitudinal. The wide range of approaches somewhat complicates evaluation of the literature.

Traffic density in school districts in Munich was associated with decreases in forced vital capacity (FVC), forced expiratory volume in 1 second (FEV<sub>1</sub>), FEV1/FVC and other measures, although the 2-kilometer (km) areas, the use of sitting position for spirometry and problems with translation for non-German children were limitations [68]. Brunekreef et al. [69] used distance from major roadways, considered wind direction and measured black smoke and NO2 inside schools. They found the largest decrements in lung function in girls living within 300 m of the roadways.

A longitudinal study of children (average age at start = 10 years) in Southern California reported results at 4 [70] and 8 years [71]. Multiple air pollutants were measured at sites in 12 communities. Due to substantial attrition, only 42% of children enrolled at the start were available for the 8-year follow-up. Substantially lower growth in FEV<sub>1</sub> was associated with  $PM_{10'}$  NO<sub>2</sub>,  $PM_{2.5'}$  acid vapor and elemental carbon at 4 and at 8 years. The analysis could not indicate whether the effects seen were reversible or not [72]. In 2007, it was reported from this same cohort that living within 500 m of a freeway was reported to be associated with reduced lung function [73].

A Dutch study [74] measured  $PM_{2.5}$ ,  $NO_2$ , benzene and EC for one year at 24 schools located within 400 m of major roadways. While associations were seen between symptoms and truck traffic and measured pollutants, there was no significant association between any of the environmental measures and FVC < 85% or FEV<sub>1</sub> < 85%. Restricting the analysis to children living within 500 m of highways generally increased ORs.

Personal exposure monitoring of NO<sub>2</sub> as a surrogate for total traffic pollutants with 298 Korean college students found statistically significant associations with FEV<sub>1</sub>, FEV<sub>1</sub>/FVC, and forced expiratory volume between 25 and 75% (FEV<sub>25-75</sub>), but not with FVC. The multivariate regression model presented suggests that FEV<sub>25-75</sub> was the outcome measure that most clearly showed an effect [75]. Cross-sectional studies of children in Korea [76] and France [77] also indicate that lung function is diminished in association with area pollutants that largely derive from traffic.

Time series studies suggest there are also acute effects. A study of 19 asthmatic children measured PM via personally carried monitors, at homes and at central site monitors. The study found deficits in FEV<sub>1</sub> that were associated with PM, although many sources besides traffic contributed to exposure. In addition, the results suggest that ability to see associations with health outcomes improves at finer scale of monitoring [78]. PM was associated with reduced FEV<sub>1</sub> and FVC in only the asthmatic subset of children in a Seattle study [79]. Studies have also seen associations between PM and self reported peak flow measurements [80,81] and asthmatic symptoms [82].

#### Cancer and near highway exposures

As noted above, both the Six-Cities Study [27] and the American Cancer Society (ACS) Study [28] found associations between PM and lung cancer. Follow-up studies using the ACS cohort [29,37] and the Six-Studies cohort [83] that controlled for smoking and other risk factors also demonstrated significant associations between PM and lung cancer. The original studies were subject to intensive replication, validation, and re-analysis which confirmed the original findings [84].

The ASHMOG study [85] was designed to look specifically at lung cancer and air pollution among Seventh-day Adventists in California, taking advantage of their low smoking rates. Air pollution was interpolated to centroids of zip codes from ambient air monitoring stations. Highway proximity was not considered. The study found associations with ozone (its primary pollutant of consideration), PM10 and SO2. Notably, these are not the pollutants that would be expected to be substantially elevated immediately adjacent to highways. A case control study of residents of Stockholm, Sweden modeled traffic-related NO2 levels at their homes over 30 years and found that the strongest association involved a 20 year latency period [86]. Another case control study drawn from the European Prospective Investigation on Cancer and Nutrition found statistically significantly elevated ORs for lung cancer with proximity to heavy traffic (>10,000 cars per day) as well as for NO<sub>2</sub> and PM<sub>10</sub> at nearby ambient monitoring stations [87]. Nafstad et al. [88] used modeled NO<sub>2</sub> and SO<sub>2</sub> concentrations at the homes of over 16,000 men in Oslo to test associations with lung cancer incidence. The models included traffic and point sources. The study found small, but statistically significant associations between NO<sub>2</sub> and lung cancer. Problems that run through all these studies are weak measures of exposure to secondhand tobacco smoke, the use of main roads rather than highways as the exposure group and modeled rather than measured air pollutants.

A study of regional pollution in Japan and a case control study of more localized pollution in a town in Italy also found associations between NO<sub>2</sub> and lung cancer and PM and lung cancer [89,90]. On the other hand, a study that calculated SIRs for specific cancers across lower and higher traffic intensity found little evidence of an association with a range of cancers [91].

The plausibility of near-highway pollution causing lung cancer is bolstered by the presence of known carcinogens in diesel PM. The US EPA has concluded after reviewing the literature that diesel exhaust is "likely to be carcinogenic to humans by inhalation" [92]. An interesting study of UFP and DNA damage adds credibility to an association with cancer [93]. This study had participants bicycle in traffic in Copenhagen and measured personal exposure to UFP and DNA oxidation and strand breaks in mononuclear blood cells. Bicycling in traffic increased UFP exposure and oxidative damage to DNA, thus demonstrating an association between DNA damage and UFP exposure *in vivo*.

#### Policy and research recommendations

Based on the literature reviewed above it is plausible that gradients of pollutants next to highways carry elevated health risks that may be larger than the risks of general area ambient pollutants. While the evidence is considerable, it is not overwhelming and is weak in some areas. The strongest evidence comes from studies of development of asthma and reduction of lung function during childhood, while the studies of cardiac health risk require extrapolation from area studies of smaller and larger geographic scales and inference from toxicology laboratory investigations. The lung cancer studies, because they include pollutants such as  $O_3$  that are not locally concentrated, are not particularly strong in terms of the case for near-high-
way risk. There is a need for lung cancer research that uses major highways rather than heavily trafficked roads as the environmental exposure.

While more studies of asthma and lung function in children are needed to confirm existing findings, especially studies that integrate exposure at school, home and during commuting, to refine our knowledge about the association, we would point to the greater need for studies of cardiac health and lung cancer and their association with near highway exposures as the primary research areas needing to be developed. Many of the studies of PM and cardiac or pulmonary health have focused on mortality. Near highway mortality studies may be possible, but would be lengthy if they were initiated as prospective cohorts. Other possibilities include retrospective case control studies of mortality, cross sectional studies or prospective studies that have end points short of mortality, such as biological markers of disease. For all health end points there is a need for studies that adequately address the possible confounding of SES with proximity to highways. There is good reason to think that property values decline near highways and that control for SES by, for example, income, may be inadequate.

Because of the incomplete development of the science regarding the health risks of near highway exposures and the high cost and implication of at least some possible changes in planning and development, policy decisions are complicated. The State of California has largely prohibited siting of schools within 500 feet of freeways (SB 352; approved by the governor October 2, 2003). Perhaps this is a viable model for other states or for national-level response. As it is the only such law of which we are aware, there may be other approaches that will be and should be tried. One limitation of the California approach is that it does nothing to address the population already exposed at schools currently cited near freeways and does not address residence near freeways.

# Conclusion

The most susceptible (and overlooked) population in the US subject to serious health effects from air pollution may be those who live very near major regional transportation route, especially highways. Policies that have been technology based and regional in orientation do not efficiently address the very large exposure and health gradients suffered by these populations. This is problematic because even regions that EPA has deemed to be in regional PM "attainment" still include very large numbers of near highway residents who currently are not protected. There is a need for more research, but also a need to begin to explore policy options that would protect the exposed population.

# Abbreviations

UFP = ultra fine particles

- BC = black carbon
- $NO_2$  = nitrogen dioxide
- NOx = oxides of nitrogen
- CO = carbon monoxide
- PM = particulate matter

 $PM_{2.5}$  = particulate matter less than 2.5 um

- $PM_{10}$  = particulate matter less than 10 um
- PPAH = particle bound polyaromatic hydrocarbons
- EC = elemental carbon

VOC = volatile organic compounds

 $SO_2$  = sulfur dioxide

ACS = American Cancer Society

SES = socioeconomic status

EPA = Environmental Protection Agency

OR = odds ratio

FEV<sub>1</sub> = forced expiratory volume in 1 second

 $FEV_1/FVC$  = ratio of  $FEV_1$  and forced vital capacity

 $FEV_{25-75}$  = forced expiratory volume between 25 and 75

FVC = forced vital capacity

 $ug/m^3$  = micrograms per cubic meter of air

m = meters

um = micrometers

veh/d = vehicles per day

veh/h = vehicles per hour

# **Competing interests**

The author(s) declare that they have no competing interests.

# **Authors' contributions**

DB took the lead on the manuscript. He co-wrote the background and wrote the sections on asthma, lung function and cancer and the conclusions. JLD wrote the section on air pollutants near roadways and contributed substantially to the background. CR wrote the section on cardiovascular health. All authors participated in editing and refining the manuscript and all read it multiple times, including the final version.

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# Repeated hospital encounters for asthma in children and exposure to traffic-related air pollution near the home

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**Background:** Aggregate hospital encounters for asthma (admissions or emergency department visits) have been associated with daily regional air pollution. There are fewer data on relationships between repeated hospital encounters and traffic-related air pollution near the home.

**Objective:** To estimate the association of local traffic-generated air pollution with repeated hospital encounters for asthma in children.

**Methods:** Hospital records for 2,768 children aged 0 to 18 years (697 of whom had  $\geq$ 2 encounters) were obtained for a catchment area of 2 hospitals in northern Orange County, California. Residential addresses were geocoded. A line source dispersion model was used to estimate individual seasonal exposures to local traffic–generated pollutants (nitrogen oxides and carbon monoxide) longitudinally beginning with the first hospital encounter. Recurrent proportional hazards analysis was used to estimate risk of exposure to air pollution adjusting for sex, age, health insurance, census-derived poverty, race/ethnicity, residence distance to hospital, and season. The adjustment variables and census-derived median household income were tested for effect modification.

**Results:** Adjusted hazard ratios for interquartile range increases in nitrogen oxides (4.00 ppb) and carbon monoxide (0.056 ppm) were 1.10 (95% confidence interval, 1.03–1.16) and 1.07 (1.01–1.14), respectively. Associations were strongest for girls and infants but were not significantly different from other groups. Stronger associations in children from higher-income block groups (P < .09 for trend) may have been due to more accurate data.

**Conclusions:** Associations for repeated hospital encounters suggest that locally generated air pollution near the home affects asthma severity in children. Risk may begin during infancy and continue in later childhood, when asthma diagnoses are clearer. *Ann Allergy Asthma Immunol.* 2009;102:138–144.

# INTRODUCTION

Many studies<sup>1</sup> show that children with asthma are susceptible to acute adverse changes in asthma outcomes from short-term increased exposure to ambient air pollutants measured at central regional sites at some distance from their residence. A

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few studies<sup>2–5</sup> have shown associations of pediatric asthma outcomes with personal exposure measurements of air pollutants. There are fewer data on whether certain air pollution sources cause these asthma associations largely because analyses have focused on temporal rather than spatial differences in exposure. Spatial heterogeneity of potentially toxic pollutant components are not well represented by data from ambient air monitoring sites, which have provided the bulk of exposure data in previous studies.<sup>6,7</sup>

A major contributor to air pollution exposure in urban areas is from mobile transportation sources. In southern California, for example, on-road emission sources alone contribute approximately 45% of volatile organic compounds, 63% of nitrogen oxide (NO<sub>x</sub>), and 76% of carbon monoxide (CO) in the air.<sup>8</sup> There is a growing view that to accurately measure the magnitude of pediatric respiratory associations, air pollutant exposures are best evaluated closer to where children reside.<sup>9</sup> High home or school traffic density has been associated with prevalence of diagnosed asthma in epidemiologic studies.<sup>10,11</sup> Cohort studies<sup>12–18</sup> have shown associations between asthma incidence or early wheeze or cough without a cold and traffic-related air pollution near the homes of preschool children using geographic information system (GIS)–based exposure models.

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Numerous experimental studies have provided evidence that exposure to chemicals capable of inducing airway oxidative stress, such as polycyclic aromatic hydrocarbons from diesel and auto exhaust, may play a role in the onset of allergic sensitization that could lead to asthma and in the acute exacerbation of respiratory allergic diseases, including asthma.<sup>19</sup> However, the impact of exposure to traffic on repeated episodes of asthma requiring hospital care is unclear.

Time-series studies have generally evaluated the relationship between central site air pollution measurements and aggregate (nonindividual) daily data for asthma emergency department (ED) visits and hospital admissions.<sup>1</sup> We conducted the first longitudinal study<sup>20</sup> of the relationship between repeated hospital encounters for individual children admitted with an asthma diagnosis and traffic-related air pollution in the outdoor home environment of these children. We found increased risk of repeated ED visits and hospitalizations for children 18 years and younger with a primary or secondary diagnosis of asthma in those living within 300 m of arterial roads or freeways. At highest risk were children in the top quintile of traffic density and those who had 750 m or more of arterial road and freeway length within 300 m of their residence. The present study advances this analysis of home traffic indices by using an improved GIS-based exposure evaluation method and air dispersion models. We aimed to estimate the risk of repeated hospital encounters in a cohort of children with a primary diagnosis of asthma in relation to individual exposures to local traffic-generated air pollution. Furthermore, given previous evidence,<sup>21</sup> we tested whether children of lower socioeconomic status are at increased risk from air pollution exposures.

# **METHODS**

# Population and Outcomes

We passively followed up patients aged 0 to 18 years admitted to the hospital or seen in the ED with a primary diagnosis of asthma. Hospital data were extracted from billing records at 2 hospitals primarily serving the urban core of Northern Orange County. The study region consists of census block areas located within 13 km of the Children's Hospital of Orange County (CHOC) or the University of California Irvine Medical Center (UCIMC) (within 2.5 km of each other). This region was determined by mapping all records and finding a high density of patients visiting the CHOC and the UCIMC from this catchment area. This provided a reasonable evaluation of repeated hospital utilization for individual patients.

We identified 2,768 patients seen at the CHOC or the UCIMC between January 1, 2000, and December 31, 2003. Hospital data included health insurance, sex, age, race/ethnicity, and home address. For the 2,768 identified patients there were 4,020 unique hospital encounters (ED visits or hospitalizations by a particular patient  $\geq$ 8 days apart). We geocoded the home addresses of all the patients and linked

this to US Census 2000 block group socioeconomic data and traffic data using the GIS. The institutional review boards of the UCIMC and the CHOC approved the study protocol and establishment of the hospital records surveillance system for respiratory illnesses.

# Exposure Evaluation

Residential addresses at the first hospital encounter were successfully geocoded for 93% of the patients (Tele Atlas North America Inc, Boston, Massachusetts). California Department of Transportation traffic data for major roads and highways were linked to the home locations.

We applied CALINE4 dispersion models to estimate nitrogen dioxide (NO<sub>2</sub>), NO<sub>x</sub> (nitric oxide + NO<sub>2</sub>), and CO concentrations at each residence from local traffic emissions of gasoline vehicles and diesel trucks within a 5-km radius of each residence. The 5-km radius was used previously, and reasonable agreement was observed between CALINE4modeled and measured 2-week average NO<sub>2</sub> concentrations at 260 residences in southern California ( $R^2 = 0.3-0.9$ ).<sup>22</sup> The CALINE4 model is a gaussian line source dispersion model designed to estimate local pollutant concentrations from motor vehicle emissions based on traffic volumes, roadway geometry, vehicle emission rates, and meteorologic conditions (wind speed and direction, atmospheric stability, and mixing heights).<sup>23</sup> Wind patterns affect the general direction and dispersion of pollutants, leading to different exposures for individuals on the upwind vs downwind side of traffic sources.6 Average diurnal and day-of-week freeway and nonfreeway traffic variations were included. Emission factors were obtained from the California Air Resources Board's EMFAC2007 (v2.3) vehicle emissions model. Meteorologic data were obtained from the National Weather Service.

Exposures were updated for each participant every 6-month season from the time of entry into the study at first admission or ED visit (event) to the end of follow-up. Seasons were divided into 2 periods of southern California weather for CALINE4 estimates (warm season: May-October; cool season: November-April). Therefore, exposures during follow-up were estimated seasonally across the 4-year study.

# Statistical Analysis

The relationship between hospital encounters and trafficrelated air pollution (dispersion-modeled CO, NO<sub>2</sub>, and NO<sub>x</sub>) was tested using recurrent event proportional hazards models in SAS version 9.2 (SAS Institute Inc, Cary, North Carolina). We estimated the baseline hazard for admission separately for each recurrence time and assumed a common log–hazard ratio for the exposure association across all recurrence times.<sup>24</sup> We accounted for within-patient correlation of recurrent events by using robust variance estimates.<sup>25</sup> Only 3 patients had 11 to 12 readmissions, so we considered only 10 or fewer readmissions per patient in the analysis. Patients were considered to be at risk for recurrence from the time of first hospital encounter until the end of the observation period (December 31, 2003) or their 19th birthday. Time at risk started at the first or a subsequent event and ended with each season (when time at risk begins with the next seasonal exposure) or at the next event (when time at risk begins again with the current seasonal exposure).

We adjusted for a priori-identified potential confounders available from hospital records: age group (0, 1-5, 6-18 years), sex, race/ethnicity, insurance status, and residence distance to hospital. We also controlled for neighborhood socioeconomic status using US Census 2000 percent of households below the poverty level, for which there was no clear evidence of effect modification. We tested covariates for effect modification in separate models including product terms (interactions) of the air pollutant with the potential effect modifier, including age group, sex, race/ethnicity, insurance status, season, residence distance to hospital, and another indicator of neighborhood socioeconomic status (median household income). Significance tests for product terms were evaluated using the Wald  $\chi^2$  test for each contrast. We assume that product term P < .10 indicates significant interaction, ie, that the association with air pollution differs in one group compared with a reference group (eg, boys vs girls). Results stratified by group were obtained from product term models. Hazard ratios and 95% confidence intervals were calculated for interquartile range increases in air pollutants to standardize and compare associations regardless of pollutant concentration ranges or units of measurement.

# RESULTS

There were 2,071 children (74.8%) with 1 hospital encounter during follow-up and 697 (25.2%) with 2 or more (Table 1). There was an expected predominance of boys, and 1,666 children (60.2%) were 0 to 5 years old at their first hospital encounter and had 66.7% of readmissions. Seasonal air pollutant exposures are given in Table 2. Pollutants were strongly correlated (R > 0.9). The modeled concentrations of fresh traffic emissions equaled approximately 20% of ambient NO<sub>x</sub> concentrations at the regional station (38 ppb). Other pollutants (CO and NO<sub>2</sub>) shared a similar pattern. Nevertheless, fresh traffic-generated air pollution contributes greatly to the spatial heterogeneity of ambient pollution.<sup>6</sup>

Table 3 indicates the significant increased risks of repeated hospital encounters of 7% to 10% per interquartile range increase in traffic-related NO<sub>x</sub> and CO exposures. Associations for NO<sub>2</sub> are approximately half that for NO<sub>x</sub> and do not reach significance at P < .05. There is little difference in coefficients between adjusted and unadjusted models and between NO<sub>x</sub> and CO. The remaining models include NO<sub>x</sub> but not NO<sub>2</sub>.

Table 4 gives the models stratified by sex and age group. Although the product terms (interactions) are not significant, the point estimates for CO and  $NO_x$  are stronger in girls than in boys and in infants than in older children. Hazard ratios for children aged 6 to 18 years are more positive than for those aged 1 to 5 years, but the lower 95% confidence limits dip below 1.0 in both groups.

Table 5 provides the models stratified by census block group poverty and median household income above vs below Table 1. Demographic Characteristics of the 2,768 Study Participants

Characteristic	Readmission for asthma, No. (%)			
Characteristic	No	Yes		
	(n = 2,071)	(n = 697)		
Sex				
Female	892 (43.1)	277 (39.7)		
Male	1,179 (56.9)	420 (60.3)		
Age group at study entry, y				
0	311 (15.0)	197 (28.3)		
1–5	890 (43.0)	268 (38.4)		
6–18	870 (42.0)	232 (33.3)		
Race				
White non-Hispanic	910 (43.9)	327 (46.9)		
White Hispanic	904 (43.7)	317 (45.5)		
Black	56 (2.7)	15 (2.2)		
Asian	52 (2.5)	14 (2.0)		
Other	94 (4.5)	17 (2.4)		
Unknown	55 (2.7)	7 (1.0)		
Insurance status at study entry				
Private	799 (38.6)	295 (42.3)		
Government sponsored or self-pay	1,042 (50.3)	371 (53.2)		
Unknown	230 (11.1)	31 (4.5)		
Census block median household income (quartiles), \$				
≤36,672	516 (24.9)	176 (25.2)		
>36,672-45,000	517 (25.0)	176 (25.2)		
>45,000–59,375	507 (24.5)	190 (27.3)		
>59,375	531 (25.6)	155 (22.2)		
Census block percentage below poverty (quartiles)				
≤6.3	527 (25.4)	164 (23.5)		
>6.3–14.0	515 (24.9)	178 (25.5)		
>14.0-23.3	509 (24.6)	173 (24.8)		
>23.3	520 (25.1)	182 (26.1)		
Residence distance to treating	. ,	. ,		
hospital, median, km				
≤6.36	1,022 (49.3)	362 (51.9)		
>6.36	1,049 (50.7)	335 (48.1)		

the median population distribution. Although hazard ratios were larger for those in block groups with more families below the poverty level, product terms were nonsignificant. Models stratified by median household income showed stronger and significant associations for both pollutants in those in the upper half of income distribution. We did not find significant differences by health insurance status, although coefficients were larger for those with private insurance (Table 5). Results by race/ethnicity showed a lower risk estimate for nonwhite patients attributable to black, Asian, and other patients (data not shown). Therefore, we combined these non-Hispanic nonwhite groups because of low sample sizes in each (Table 1) and compared regression estimates for them and for Hispanic patients with those of white patients (Table 5). There were no significant differences in associations between white and Hispanic patients for NO<sub>x</sub> or CO. However,

Exposure and season	Mean (SD)	Minimum	25th percentile	Median	75th percentile	Maximum	Interquartile range
NO <sub>2</sub> , ppb							
Cool	5.24 (2.39)	0.66	3.72	4.86	6.42	17.9	2.70
Warm	5.66 (2.61)	0.71	4.00	5.15	6.72	26.0	2.72
NO <sub>x</sub> , ppb							
Cool	8.10 (3.75)	1.00	5.70	7.52	9.98	27.0	4.29
Warm	6.35 (2.99)	0.76	4.45	5.75	7.59	29.7	3.14
CO, ppm							
Cool	0.114 (0.052)	0.014	0.081	0.106	0.140	0.378	0.060
Warm	0.103 (0.048)	0.013	0.072	0.093	0.123	0.482	0.051

Table 2. Distribution of Traffic-Related Air Pollution Exposures by Season<sup>a</sup>

Abbreviations: CO, carbon monoxide; NO<sub>2</sub>, nitrogen dioxide; NO<sub>x</sub>, nitrogen oxide.

<sup>a</sup> The cool season is November through April, and the warm season is May through October. Exposures are estimated from all person-times of observation during follow-up.

Table 3. Traffic-Related Air Pollution and Repeated Hospital Encounters for Asthma in 2,768 Children Aged 0 to 18 Years

Exposure	Unadjusted HR (95% Cl)ª	P value	Adjusted HR (95% Cl) <sup>b</sup>	P value
NO <sub>2</sub>	1.044 (0.992–1.098)	.10	1.042 (0.987–1.101)	.14
NO <sub>x</sub>	1.094 (1.035-1.156)	.002	1.097 (1.034-1.164)	.002
CO	1.072 (1.016–1.131)	.01	1.073 (1.013–1.137)	.02

Abbreviations: CI, confidence interval; CO, carbon monoxide; HR, hazard ratio; NO<sub>2</sub>, nitrogen dioxide; NO<sub>x</sub>, nitrogen oxide.

<sup>a</sup> Values are for an interquartile range increase in the air pollutant (NO<sub>2</sub>, 2.68 ppb; NO<sub>x</sub>, 4.00 ppb; and CO, 0.056 ppm).

<sup>b</sup> Adjusted for sex, age group, race, health insurance status, residence distance to hospital, and poverty.

Table 4. Traffic-Related Air Pollution and Repeated Hospital Encounters for Children With Asthma by Sex and Age

Model	Patients, No.	Exposure	HR (95% CI) <sup>a</sup>	P value	Product term <i>P</i> value
Sex					
Male	1,599	NO <sub>x</sub>	1.071 (0.991–1.158)	.08	.30
		CO	1.054 (0.978-1.137	.17	.45
Female	1,169	NO <sub>x</sub>	1.136 (1.043-1.238)	.003	Reference
		CO	1.100 (1.011–1.197)	.02	Reference
Age group, y					
0	508	NO <sub>x</sub>	1.197 (1.075–1.333)	.02	.22
		CO	1.158 (1.041–1.289)	.007	.32
1–5	1,158	NO <sub>x</sub>	1.042 (0.952-1.140)	.18	.52
		CO	1.021 (0.933-1.117)	.65	.44
6–18	1,102	NO <sub>x</sub>	1.090 (0.979-1.212)	.12	Reference
		CO	1.076 (0.972-1.191)	.16	Reference

Abbreviations: CI, confidence interval; CO, carbon monoxide; HR, hazard ratio; NO<sub>x</sub>, nitrogen oxide.

<sup>a</sup> Values are for an interquartile range increase in the air pollutant (NO<sub>x</sub>, 4.00 ppb; CO, 0.056 ppm) adjusted for sex, age group, race, health insurance status, residence distance to hospital, and poverty. Stratified results are from the product term models.

there were significantly smaller associations for non-Hispanic nonwhite patients than for white patients. There was no significant interaction for residence distance to hospital or for season (data not shown).

# DISCUSSION

# Overview of Findings and Implications

We found that residential exposure to traffic-related air pollution is associated with increased risk of hospital encounters for asthma in children. There was some evidence that infants and girls were at highest risk. These results are consistent with those of a cross-sectional study<sup>26</sup> and 2 case-control studies<sup>27,28</sup> showing increased risk of asthma hospitalizations or other medical care visits with increasing home traffic density indices. These results are also consistent with those of a longitudinal analysis of recurrent respiratory hospital encounters using traffic indices,<sup>20</sup> but associations in that study were not significant for patients with a primary diagnosis of asthma. Table 5. Traffic-Related Air Pollution and Repeated Hospital Encounters for Children With Asthma by Socioeconomic Status and Race/Ethnicity

Model	Patients, No.	atients, Exposure HR (95% CI)ª No.		Patients, Exposure HR (95% CI) <sup>a</sup> <i>P</i> va No.		re HR (95% CI) <sup>a</sup> <i>P</i> value	
Poverty <sup>c</sup>							
Median or less	1,384	NO <sub>x</sub>	1.078 (0.999–1.163)	.05	Reference		
		CO	1.054 (0.979–1.134	.16	Reference		
Greater than the median	1,384	NO <sub>x</sub>	1.116 (1.026–1.214)	.01	.39 (.70)		
		CO	1.094 (1.006–1.190)	.04	.49 (.71)		
Median household incomed							
Greater than the median	1,383	NO <sub>x</sub>	1.145 (1.054–1.244)	.001	Reference		
		CO	1.120 (1.034–1.213)	.005	Reference		
Median or less	1,385	NO <sub>x</sub>	1.068 (0.983–1.160)	.12	.23 (.09)		
		CO	1.041 (0.959–1.129)	.34	.20 (.07)		
Insurance status							
Private	1,094	NO <sub>x</sub>	1.136 (1.036–1.247)	.007	Reference		
		CO	1.102 (1.006–1.206)	.04	Reference		
Government sponsored or self-pay	1,413	NO <sub>x</sub>	1.080 (1.005–1.160)	.04	.38		
		CO	1.061 (0.989–1.138)	.10	.51		
Unknown	261	NO <sub>x</sub>	0.886 (0.569-1.379)	.59	.28		
		CO	0.913 (0.591–1.412)	.68	.41		
Race/ethnicity							
White	1,237	NO <sub>x</sub>	1.145 (1.055–1.243)	.001	Reference		
		CO	1.113 (1.027–1.205)	.009	Reference		
Hispanic	1,221	NO <sub>x</sub>	1.097 (1.008–1.193)	.03	.46		
		CO	1.081 (0.996–1.173)	.06	.62		
Non-Hispanic nonwhite	310	NO <sub>x</sub>	0.829 (0.624–1.102	.20	.03		
		CO	0.804 (0.601–1.074)	.14	.03		

Abbreviations: CI, confidence interval; CO, carbon monoxide; HR, hazard ratio;  $NO_{x^1}$  nitrogen oxide.

<sup>a</sup> Values are for an interquartile range increase in the air pollutant (NO<sub>x</sub>, 4.00 ppb; CO, 0.056 ppm) adjusted for sex, age group, race, health insurance status, residence distance to hospital, and poverty. Stratified results are from product term models.

<sup>b</sup> The *P* value for interaction of air pollution with socioeconomic variables and race/ethnicity. The *P* value for trend from continuous poverty and median household income is given in parentheses.

° The median of Census 2000 block group percentage below the federal poverty level was 14%.

<sup>d</sup> The median of Census 2000 block group of median household income was \$45,000.

The present results support the use of dispersion modeling for evaluating traffic-related exposures, but other methods involving direct home or neighborhood air pollutant measurements have been proposed to further limit exposure error.<sup>6</sup>

We did not include background pollutant concentrations because variability is likely low within the 13-km study radius. Dispersion-modeled gases are considered surrogates of other more toxic gases and particles emitted from nearby diesel trucks and automobiles, including ultrafine particles that have been found at notably higher concentrations near roadways along with black carbon, particle number, and CO.<sup>29</sup> The stronger associations for NO<sub>x</sub> compared with NO<sub>2</sub> support this because NO<sub>2</sub> is strongly affected by photochemical reactions that can occur across time away from roadways, whereas NO<sub>x</sub> is expected to capture traffic emissions more generally.<sup>30</sup> Key pollutants likely represented by NO<sub>x</sub> and CO are those carried by ultrafine particles. Ultrafine particles carry more redox-active components than larger particles, which are more spatially homogenous.<sup>7,31,32</sup> Based in large part on experimental evidence, it has been hypothesized that particles from vehicular exhaust, especially in the ultrafine range, can trigger oxidative stress. When antioxidant responses are then overwhelmed, airway inflammation may follow, leading to increasing asthma symptoms in susceptible children.<sup>19,33</sup>

# Potentially Susceptible Subgroups

There was no significant difference in association by sex or age group, and widened confidence intervals in stratified results suggest that subsample sizes may have limited the ability to compare these groups. Nevertheless, the largest associations were for infants, followed by children aged 6 to 18 years, in whom the diagnosis of asthma is clearest. There was limited evidence of stronger associations in girls, consistent with other studies of traffic-related air pollution and respiratory outcomes.<sup>10,20,27,34</sup> The underlying reasons for sex differences are unknown.

Significant associations for  $NO_x$  and CO in infants are intriguing. Approximately half of the repeated encounters in this group occurred between ages 1 and 3 years. These findings suggest that early-life exposures to traffic pollutants may affect asthma severity and development. This view is supported by studies<sup>12–18</sup> of preschool children that have found increased risk of incident asthma or wheeze or cough without a cold from long-term exposures to local traffic– related air pollutants using GIS-based methods. A recent study<sup>35</sup> showed acute increases in wheeze occurrence with elevations in daily regional NO<sub>2</sub> and NO<sub>x</sub> levels in infants and children followed up during their first 3 years of life. These findings are consistent with emerging views that gene-environment interactions during early life are important in the prognosis of early-onset wheeze and in the development of lung function deficits and asthma in later life.<sup>36,37</sup>

In contrast to previous findings,<sup>20</sup> we did not find stronger associations in children without insurance or with government-sponsored insurance than in children with private insurance. Instead, there were significantly stronger associations in patients living in census block groups in the upper half of the distribution of median household income. However, there was no significant difference in associations between white and Hispanic patients (the predominant minority group). Both groups showed significant or nearly significant associations for NO<sub>x</sub> and CO. The remaining minorities (blacks, Asians, and others) showed significantly smaller null associations compared with white patients. The distribution of median household income by race/ethnicity did not explain these findings because only Hispanic patients showed significantly more families below the median income distribution (61%) compared with white patients (40%) and the remaining minorities (44%) (P < .001 by  $\chi^2$  test).

Evaluating community-level contextual factors may be important in understanding the heterogeneity in asthma expression and risk.<sup>38</sup> Environmental disparities, such as exposure to traffic and indoor allergens, have been proposed to explain the increased asthma burden in minority and lower socioeconomic groups.<sup>39</sup> Although the present findings do not support this hypothesis, the number of potentially important environmental factors that differ by communities is large<sup>39</sup> and mostly unmeasured in the present study. Furthermore, we speculate that these findings of smaller associations in children living in lower-income census block groups may have been attributable to 2 factors: (1) less consistent exposure as evaluated at study entry due to less stable residence and (2) less consistent outcome data due to more variable use of hospitals, including those not evaluated in this study. To test this possibility, we successfully contacted parents and administered a short survey for 250 randomly selected patients aged 0 to 8 years seen at the participating EDs or admitted to the hospitals with lower respiratory tract illnesses. Of 103 respondents with nonmissing data, those with survey-reported household annual incomes less than 30,000 (N = 58) were significantly more likely to have lived in the same residence for 12 or fewer months (29%) than were the 45 families making \$30,000 or more (9%) (P < .02 by  $\chi^2$  test). In addition, those with annual household incomes less than \$30,000 were more likely to have gone to a hospital not captured in the surveillance data (26%) than were families making at least \$30,000 (13%) (P < .12 by  $\chi^2$  test).

There are several limitations to the present study design. First, some children used other hospitals, and, therefore, the outcome ascertainment is incomplete and the censoring assumption underlying the analysis is subject to some error. We also did not directly contact parents. Therefore, we could not ascertain any change in residence after the first event, leading to potential exposure error. Additional exposure error comes from unmeasured exposures occurring when children are away from their residence. We also did not have data on other known or suspected risk factors that may have confounded associations, including family history of asthma and environmental exposures (eg, second-hand smoke, aeroallergens, endotoxin, family size).<sup>38,39</sup> This may have led to misclassification of risk. For example, differences in the distribution of indoor and outdoor allergen triggers may have biased associations. Because the study used a retrospective cohort design, it was not possible to obtain allergen measurements during times at risk. Such measures could be used in future prospective cohort studies.

Finally, we could not confirm asthma diagnoses independently, which is especially important in younger patients, in whom lower respiratory tract illnesses can often induce asthma-like symptoms that resolve at later ages. Asthma diagnosis can be made using objective methods, such as spirometry, at school ages. Nevertheless, given other evidence,<sup>12,40</sup> it is conceivable that air pollutants also enhanced the propensity toward lower respiratory tract illness–related wheeze in the present population.

# Conclusions

Traffic-related NO<sub>x</sub> and CO were associated with repeated hospital encounters for asthma in children, suggesting that traffic-generated air pollution near the home affects asthma symptom severity. These findings suggest that this potential risk may begin during infancy. Early lower respiratory tract illness with recurrent wheeze symptoms can increase asthma risk in later childhood, when the diagnosis of asthma is clearer.<sup>41,42</sup> Evidence from the present study supports a possible role of pollutants from traffic emissions in this progression.

Cohort studies of asthma risk in children to date have focused on general populations or on children with family histories of atopy. Prospective environmental data are sparse for high-risk populations who present to the hospital with asthma exacerbations. Additional work with improved assessments of air pollutant exposures and asthma outcomes in such high-risk populations is likely to be fruitful given the present results.

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# Childhood Asthma and Exposure to Traffic and Nitrogen Dioxide

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**Background:** Evidence for a causal relationship between trafficrelated air pollution and asthma has not been consistent across studies, and comparisons among studies have been difficult because of the use of different indicators of exposure.

**Methods:** We examined the association between traffic-related pollution and childhood asthma in 208 children from 10 southern California communities using multiple indicators of exposure. Study subjects were randomly selected from participants in the Children's Health Study. Outdoor nitrogen dioxide ( $NO_2$ ) was measured in summer and winter outside the home of each child. We also determined residential distance to the nearest freeway, traffic volumes on roadways within 150 meters, and model-based estimates of pollution from nearby roadways.

**Results:** Lifetime history of doctor-diagnosed asthma was associated with outdoor NO<sub>2</sub>; the odds ratio (OR) was 1.83 (95% confidence interval = 1.04-3.22) per increase of 1 interquartile range (IQR = 5.7 ppb) in exposure. We also observed increased asthma associated with closer residential distance to a freeway (1.89 per IQR; 1.19-3.02) and with model-based estimates of outdoor pollution from a freeway (2.22 per IQR; 1.36-3.63). These 2 indicators of freeway exposure and measured NO<sub>2</sub> concentrations were also associated with wheezing and use of asthma medication. Asthma was not associated with traffic volumes on roadways within 150 meters of homes or with model-based estimates of pollution from nonfreeway roads.

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Copyright © 2005 by Lippincott Williams & Wilkins ISSN: 1044-3983/05/1606-0737 DOI: 10.1097/01.ede.0000181308.51440.75 **Conclusions:** These results indicate that respiratory health in children is adversely affected by local exposures to outdoor  $NO_2$  or other freeway-related pollutants.

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Previous studies have demonstrated a link between outdoor air pollution and the occurrence of symptoms in children already diagnosed with asthma.<sup>1</sup> However, results are not consistent with respect to whether air pollution causes asthma. Most studies have found little evidence to support an association between community-average exposures to air pollution and community asthma prevalence.<sup>2</sup> These study designs failed to account for the variability in exposure resulting from vehicular traffic in urban areas. Asthma has been associated with local variation in traffic patterns within communities in many,<sup>3–7</sup> but not all,<sup>8–11</sup> studies that have examined the impact of local traffic. One possible reason for the inconsistency in these recent studies is the use of different indicators of traffic-related pollution. Some have measured pollutant exposure at home, some have estimated traffic volume near the home, and some have estimated exposure to traffic-related pollutants at home based on dispersion models. Little work has been done to validate estimates of traffic exposure against measured pollution concentrations. Most studies have been conducted in European cities, which differ from U.S. cities in the layout of streets and homes, and also in the relative proportion of diesel- to gasoline-powered vehicles.

We evaluated several commonly available indicators of traffic exposure and compared them with nitrogen dioxide  $(NO_2)$  levels measured at the homes of subjects participating in the Children's Health Study. The Children's Health Study was initiated in 1993 with a cohort of school-aged children from 12 southern California communities representing a wide range in air quality. To date, this study has reported associations between air pollution and several outcomes, including lung function, <sup>12–15</sup> respiratory symptoms in asthmatics, <sup>16,17</sup> and asthma incidence.<sup>18</sup> These analyses have relied on com-

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parisons of average health across communities in relation to the pollution levels measured at a central site monitor in each community. In 2000, we conducted a study to measure  $NO_2$ levels at a random sample of children's homes within each of the study communities. We examine how local variation in  $NO_2$  and indicators of exposure to traffic-related pollutants are related to each other, and whether they are associated with lifetime prevalence of asthma and asthma-related outcomes.

# METHODS

# **Study Subjects**

In calendar year 2000, we measured outdoor NO<sub>2</sub> levels at the homes of randomly selected participants in the Children's Health Study. Eligible children included those who were originally enrolled as fourth graders (average age = 10 years) in 1993 (cohort 1) or 1996 (cohort 2), with the additional criteria that in 2000, they were still actively participating in the study and had lived in the same home since study enrollment. We excluded 2 of the 12 study communities (Lompoc and Lake Arrowhead) from this study, because neither has any major sources of traffic. From the pool of 890 eligible subjects, we randomly sampled 229 children for NO2 monitoring. Samplers were deployed outside each home for 2-week periods in the summer and fall of 2000. Valid measurements in both seasons were obtained at 208 (91%) of the homes. Reasons for invalid measurements included lost samplers, subjects who moved, and difficulties with field access or deployment. The study protocol was approved by the Institutional Review Board for Human Studies at the University of Southern California, and informed consent was provided by a parent or legal guardian for all study subjects.

# Nitrogen Dioxide Sampling

Ambient NO<sub>2</sub> was sampled with Palmes tubes.<sup>19</sup> These diffusion-based samplers have been widely used in several microenvironmental and personal air quality studies.<sup>20-22</sup> We deployed samplers outside the homes of study subjects, thus avoiding previously identified confounders such as indoor nitrous acid formation, gas stoves, or wall heaters. Samplers were attached at the roofline eaves, signposts, or rain gutters at an approximate height of 2 meters above the ground, oriented in a downward position and protected by an oversized paper cup. Duplicate samplers and field travel blanks were randomly assigned to approximately 10% of the subjects' homes. Samplers were deployed for 2-week periods in both summer (mid-August) and fall (mid-November) in all communities. Deployment across communities was accomplished over a 4-day period at the start of the summer and fall field sampling periods. Within any 1 community, samplers at all locations were deployed within a 4-hour period, and 2 weeks later the samplers were retrieved within a 4-hour period. Samplers were transported to and from the field in cooled portable ice chests. The samplers were prepared for field use and analyzed at the Harvard School of Public Health.

# **Traffic Exposures**

We characterized exposure of each study participant to traffic-related pollutants by 3 metrics: (1) proximity of the residence to the nearest freeway; (2) average number of vehicles traveling within 150 meters of the residence each day, including vehicles on freeways, arterials, major collector roads, and (where available) on minor collector roads; and (3) model-based estimates of traffic-related air pollution at the residence, derived from dispersion models that incorporate distance to roadways, vehicle counts, vehicle emission rates, and meteorologic conditions. Methods used to estimate each of these exposure factors are described subsequently.

Residence addresses were standardized and their locations geocoded using the TeleAtlas database and software (Tele Atlas Inc., Menlo Park, CA, www.na.teleatlas.com). We used the TeleAtlas MultiNet USA database, a comprehensive geo-positioning-satellite-accurate database of roadways, for all analyses because it is more accurate than the standard files available from the U.S. Census. To estimate distance to the nearest freeway, we used ERSI ArcGIS Version 8.3 (ESRI, Redland, CA, www.esri.com) software tools to calculate the distance from each residence to the nearest interstate freeway, U.S. highway, or limited access highway. In these calculations, each direction of travel was represented as a separate roadway, and the "distance to nearest freeway" was the shortest distance from the residence to the middle of the nearest set of lanes of the freeway.

To estimate vehicle counts near homes, annual average daily traffic volumes were obtained from the California Department of Transportation (CALTRANS) Highway Performance Monitoring System for the year 2000. The traffic volumes were transferred from the CALTRANS roadway network to the TeleAtlas networks using previously described methods.<sup>23</sup> The hourly traffic volumes on weekdays and weekend days were estimated from the annual average daily traffic volumes and the average diurnal and day-of-week freeway and nonfreeway traffic variations observed in Southern California. These data were used to calculate the daily average number of vehicles traveling within 150 meters of each residence, weighted by inverse distance from the home to each road. This local traffic density was expressed as traffic volume per square meter.

To obtain model-based estimates of traffic-related pollution exposure, we used the CALINE4 line-source airquality dispersion model.<sup>24</sup> Principal model inputs included roadway link geometry, link traffic volumes, meteorologic conditions (wind speed and direction, atmospheric stability, and mixing heights), and vehicle emission rates. The 5-year

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average joint distributions of wind speeds and directions were obtained from 1 surface-monitoring station in or near each study community. The dispersion model was applied to simulate the transport and dispersion of NO<sub>x</sub> as a chemically inert pollutant. Although NO, NO2, and ozone undergo rapid atmospheric chemical reactions immediately downwind of sources, NO<sub>x</sub> can be treated as a chemically inert pollutant for the first hour of transport from sources because the time-scale for  $NO_x$  oxidation is 10 to 20 hours in urban atmospheres.<sup>25</sup> Vehicle NO<sub>x</sub> emission rates were obtained from the California Air Resources Board's EMFAC2002 vehicle emissions model. Concentrations of NO<sub>2</sub> were estimated by applying the annual average ratio of observed  $NO_2$  to  $NO_x$  for each hour of the day (from the community central site monitor) to the CALINE4 model's estimated NO<sub>x</sub> concentrations. We estimated the contribution to residential exposure separately for freeway and for nonfreeway traffic.

Ambient NO<sub>2</sub> concentrations in the community are a result of meteorologic transport of pollutants into the community, local point and area source emissions, and local mobile source emissions. The CALINE4 model was used to model NO2 from local traffic in each community and, therefore, always predicts concentrations lower than the total NO<sub>2</sub> from all sources. Separate regional modeling analysis has indicated that local mobile source emissions contribute 12% to 68% of the average NO<sub>2</sub> in the study communities.<sup>23</sup> For comparison purposes, we also generated exposure assignments based on fine particulate matter (PM) and carbon monoxide (CO) emission factors. Model-based estimates of NO<sub>2</sub>, PM, and CO were very highly correlated with one another (R > 0.90), indicating that the NO<sub>2</sub>-based estimates we use in this article should be considered an estimate of traffic-related pollution in general rather than simply exposure to this specific pollutant.

# Questionnaire Data

When we originally enrolled subjects as fourth graders, each subject's parent or legal guardian completed a baseline medical history questionnaire. Asthma was defined as a "yes" response to the question "Has a doctor ever diagnosed your child as having asthma?" This questionnaire was also used to determine whether the child had recently (within the last 12 months) wheezed, recently wheezed during exercise, or was currently using any type of medication to control asthma. Questions about potential risk factors for asthma included parental income or education, environmental tobacco smoke exposure, in utero exposure to maternal tobacco smoking, and presence in the home of mildew, water damage, gas stove, pests, and pets.

# Statistical Analysis

We used logistic regression to model the relationship of each traffic measure, including measured  $NO_2$  at the home

and the traffic indicators described previously, with baseline asthma prevalence in the 208 study participants. A naturallog transformation of each traffic indicator was used in these analyses, because the distribution of each variable was positively skewed. All models included adjustments for sex, race, Hispanic ethnicity, cohort (whether the subject was enrolled in 1993 or 1996), and indicator variables for study community. We considered separate models for 2-week average NO<sub>2</sub> concentrations measured in summer and in winter and for the 4-week average across seasons. Odds ratios (ORs) for asthma in analyses of measured NO<sub>2</sub> concentrations were scaled to an increase of 5.7 ppb, the average interquartile range (IQR) in 4-week average NO2 within the 10 communities. ORs for the traffic indicators were also scaled to 1 IQR in exposure (specifically 1.2 km for distance to the nearest freeway; 2720 vehicles per m<sup>2</sup> per day for traffic volumes within 150 meters; and 0.64, 0.49, and 1.27 ppb for modelbased estimates of NO2 from freeways, nonfreeways, and all roads, respectively).

#### RESULTS

Doctor-diagnosed asthma was reported by 31 (15%) of the 208 children, with variability in prevalence across communities (Table 1). Overall community-average NO<sub>2</sub> levels measured at homes ranged from 12.9 ppb in Atascadero to 51.5 ppb in San Dimas, with similar patterns across communities in summer and winter. The NO<sub>2</sub> levels (average of summer and winter) measured at homes are shown in Figure 1. Within each community, there was substantial variation in NO<sub>2</sub> levels from home to home. Although the amount of variation in NO<sub>2</sub> was generally larger in more polluted communities, there were some exceptions. For example, there was little variation in the relatively high NO<sub>2</sub> community of Mira Loma, whereas there was considerable variation in the lower NO<sub>2</sub> community of Alpine.

The average NO<sub>2</sub> concentration measured at homes was associated with asthma prevalence (Table 2). For each increase of 5.7 ppb in average NO<sub>2</sub>, the OR for asthma increased by 1.83 (95% CI = 1.04-3.21). Odds ratios were similar whether based on summer-only (1.55) or winter-only (1.50) measurements. The effect of average NO<sub>2</sub> was of similar magnitude after adjustment for several potential confounders, including socioeconomic status of participants and housing characteristics (Table 2).

Measured NO<sub>2</sub> concentrations at homes were correlated with residential distance from the nearest freeway and with model-based estimates of traffic-related pollution from roadways (Appendix Table, available with the online version of this article). In each community, we observed negative correlations between NO<sub>2</sub> concentration and distance of the home to the freeway. The overall correlation between NO<sub>2</sub> and freeway distance, adjusted for community, was R = -0.54. The corresponding correlations of measured NO<sub>2</sub>

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				NO <sub>2</sub> (ppb)	)
Community	No.	Asthma (%)	Summer	Winter	Average <sup>†</sup>
Alpine (AL)	24	21	20.1	19.0	19.6
Atascadero (AT)	13	23	12.3	13.6	12.9
Lake Elsinore (LE)	22	5	17.6	27.4	22.5
Lancaster (LN)	16	19	16.9	22.0	19.5
Long Beach (LB)	20	10	34.6	50.5	42.5
Mira Loma (ML)	17	12	37.2	48.4	42.8
Riverside (RV)	30	20	37.9	42.8	40.3
San Dimas (SD)	34	15	52.0	51.0	51.5
Santa Maria (SM)	19	16	12.7	17.9	15.3
Upland (UP)	13	8	46.3	36.0	41.2

TABLE 1.	Distribution of Lifetime History of Asthma and Measured I	NO <sub>2</sub> by
Community	r(n = 208)	

\*Parent report of doctor-diagnosed asthma in the child.

<sup>†</sup>Mean in each community of NO<sub>2</sub> concentrations measured at homes for 2 weeks each in summer and winter. Average is the 4-week arithmetic average of summer and winter measurements.

with model-based estimates were 0.56 for pollution from freeways and 0.34 for pollution from nonfreeways. In each community, measured NO<sub>2</sub> was more strongly correlated with estimates of freeway-related pollution than with non-freeway pollution. Measured NO<sub>2</sub> was less correlated with traffic counts within 150 meters of homes (R = 0.24), with inconsistent patterns of correlations from community to community.

Both distance to the freeway and the model-based estimate of freeway-related pollutants were associated with asthma history (Table 3). Asthma prevalence was higher with decreasing distance from the freeway; specifically when comparing the 25th to 75th percentile of freeway distance, the OR was 1.89 (95% CI = 1.19-3.02). For the comparison of 75th



**FIGURE 1.** Four-week average of nitrogen dioxide measured at homes of asthmatic (solid black diamond) and nonasthmatic (open circle) children in 10 communities. See Table 1 for community abbreviations.

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to 25th percentile of model-based pollutant exposure from freeways, the OR was 2.22 (1.36-3.63). Asthma was not associated with traffic volumes or with model-based exposure to nonfreeway roads. The associations observed with freeway distance and model-based pollution from freeways were robust to adjustment for all of the potential confounders shown in Table 2 (data not shown).

Measured  $NO_2$  and the 2 freeway-related traffic indicators were also associated with recent wheeze, recent wheeze with exercise, and current use of asthma medication

TABLE 2.	Association Between 4-Week Average NO <sub>2</sub> at
Homes and	Asthma History, Adjusted for Several
Potential C	onfounders

Description	OR* (95% CI)
Base model <sup>†</sup>	1.83 (1.04–3.21)
Base model, with additional adjustment for:	
Environmental tobacco smoke	1.93 (1.09-3.43)
In utero exposure to maternal smoking	1.85 (1.05-3.28)
Parental income	1.99 (1.11–3.57)
Parental education	1.90 (1.07-3.37)
Gas stove	1.87 (1.06–3.30)
Mildew	1.81 (1.01-3.23)
Water damage	1.82 (1.03-3.21)
Cockroaches	1.83 (1.04-3.21)
Pets	1.88 (1.06–3.33)

\*Odds ratio per increase of 1 interquartile range (5.7 ppb) in NO<sub>2</sub>. <sup>†</sup>Base model includes adjustments for sex, race, Hispanic ethnicity,

cohort, and community.

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**TABLE 3.** Associations Between Exposure to Traffic at Home and Asthma History

Exposure Metric	Odds Ratio per IQR OR* (95% CI)
Distance to freeway	1.89 (1.19–3.02)
Traffic volume within 150 meters	1.45 (0.73-2.91)
Model-based pollution from:	
Freeways	2.22 (1.36-3.63)
Other roads	1.00 (0.75-1.33)
Freeways and other roads	1.40 (0.86–2.27)

\*Odds ratio per change of 1 IQR. For distance to freeway, OR for the 25th percentile compared with the 75th percentile (ie, living closer compared with farther from the freeway). For remaining traffic variables, OR for the 75th percentile compared with the 25th percentile. All models were adjusted for sex, race, Hispanic ethnicity, cohort, and community.

(Table 4). For example, the OR per increase of 5.7 ppb in measured NO<sub>2</sub> was 1.72 (1.07–2.77) for recent wheeze and was 2.19 (1.20–4.01) for current use of asthma medication.

# DISCUSSION

We found robust associations of several indicators of exposure to traffic-related air pollution at homes in southern California with lifetime history of asthma, current asthma medication use, recent wheeze, and recent exercise-induced wheeze. Residential distance to a freeway and model-based estimates of freeway traffic-emission exposure at homes were each associated with the prevalence of asthma. Each of these traffic metrics was also correlated with measured concentrations of NO<sub>2</sub>, and measured NO<sub>2</sub> was associated with asthma. Taken as a whole, these results indicate that exposure to outdoor levels of NO<sub>2</sub> or other freeway-related pollutants was a significant risk factor for asthma.

A strength of this asthma study is that it used both measured pollution and multiple indicators of exposure to traffic at the same homes in a large number of communities. The results suggest that measuring  $NO_2$  or another pollutant is important for validation of the use of traffic measures and

for selection of the most appropriate indicator of traffic exposure for the population under study. Those few studies that have measured residential exposure or that have validated models of exposure using measurements of pollutants have generally shown associations with asthma,<sup>6,7,26</sup> whereas the failure to validate traffic indicators may explain inconsistent results from several other studies.<sup>8–11</sup> In our study, simple distance to a freeway was as strongly and precisely associated with asthma and wheeze as was NO<sub>2</sub>. It remains to be seen whether the association with this simple and widely available indicator is replicable in other studies or could be used for estimating risk in communities without having to make additional measurements of traffic-related pollutants.

We did not find associations between respiratory health and other indicators of traffic near homes, including modeled pollution from nonfreeway roads and traffic volumes within 150 meters of homes. One possible explanation for this lack of association is that the contribution to pollution levels from these smaller roads (where tens or hundreds of vehicles travel each day) is trivial compared with freeways that dominate the transportation grid in southern California with daily average counts in our communities between 50,000 to 270,000 vehicles. In addition, vehicle counts are accurately measured on freeways but are only estimated on smaller roads where participants lived. Our results are in contrast to several recent (mostly European) studies that have reported associations of asthma with traffic counts in close proximity to the home.<sup>6,7,27,28</sup> These differences in results may be partly the result of differences in urban geography and closer proximity of homes in Europe to heavily traveled roadways.

There have been a few other studies of traffic and childhood asthma in the United States. One large study in southern California found no association of asthma prevalence with traffic counts within 550 feet of the home,<sup>9</sup> similar to our finding of no association with traffic volumes within 150 meters of the home. Consistent with our findings related to measured NO<sub>2</sub>, a recent study in northern California<sup>29</sup> found an association between measured traffic-related pollutants at schools and childhood asthma.

Outcome	No.	Measured NO <sub>2</sub> OR* (95% CI)	Distance to Freeway OR* (95% CI)	Model-based Pollution From Freeways OR* (95% CI)
Lifetime history of asthma	31	1.83 (1.04–3.21)	1.89 (1.19–3.02)	2.22 (1.36–3.63)
Recent wheeze <sup>†</sup>	43	1.72 (1.07-2.77)	1.59 (1.06-2.36)	1.70 (1.12-2.58)
Recent wheeze with exercise <sup>†</sup>	25	2.01 (1.08-3.72)	2.57 (1.50-4.38)	2.56 (1.50-4.38)
Current asthma medication use	26	2.19 (1.20-4.01)	2.04 (1.25-3.31)	1.92 (1.18-3.12)

\*Odds ratio per change of 1 IQR in exposure (see footnotes to Tables 2 and 4).

<sup>†</sup>Within the last 12 months.

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The observed associations of traffic with asthma are biologically plausible. Increased oxidative and nitrosative stress associated with NO2 exposure may impair respiratory responses to infection and thus result in lung injury and asthma exacerbation.<sup>20,30</sup> However, the association of NO<sub>2</sub> with asthma prevalence has been extensively evaluated in epidemiologic studies of exposure to indoor sources, often at levels considerably higher than the modest (5.7 ppb) IQR of exposure in our study, and the observed associations have not been consistent.<sup>30,31</sup> It is possible that outdoor NO<sub>2</sub>, which occurs in a complex mixture that includes particulate matter and other pollutants known to affect respiratory health, is a marker of some other traffic-related pollutant(s) responsible for increasing asthma risk. For example, some field studies suggest that the concentration of fine particulate matter, especially black smoke (an indicator of diesel exhaust), varies with nearby high-traffic roads and with NO<sub>2</sub>.<sup>32-35</sup> It has been hypothesized that particulate matter, especially diesel exhaust particulate, may contribute to the development of allergies and asthma.36 Additional research is needed to study the health effects of specific pollutants that occur in complex mixtures of traffic emissions.

A possible limitation of this study is the assessment of asthma by questionnaire, which could be affected by access to care and differences in diagnostic practice among physicians.<sup>37</sup> However, we found associations of traffic indicators with recent wheeze and exercise-induced wheeze, 2 symptoms of asthma that are unlikely to be affected by access to care or diagnostic bias. Another limitation is the possibility of poor or biased reporting of asthma by parents. However, self-report of physician-diagnosed asthma has been found to reflect what physicians actually reported to patients, at least in adults, and validity as assessed by repeatability of response is good.<sup>38</sup> Self-report of physician diagnosis has been the main criterion for identifying asthma in epidemiologic studies of children and has been recommended as the epidemiologic gold standard because a more precise identification tool is not available.<sup>39</sup> Reporting bias is unlikely to have explained the observed associations, because parents were not aware of the specific focus of the study on air pollution at the time the questionnaire was completed. Biased participation with respect to disease status in this substudy is also unlikely, because the prevalence of doctor-diagnosed asthma in the sample of 208 children (15%, Table 1) was not very different from the asthma prevalence in the remaining 668 eligible children (13%, P = 0.56).

Another potential study limitation is that measured  $NO_2$ and the traffic metrics were determined after the onset of asthma and extrapolated to earlier in life. However, the systems of freeways and other major roadways in the study communities have been in place and essentially unchanged for many years. We thus expect that the spatial pattern of exposure to traffic emissions from home to home was relatively similar over the lifetimes of these children. Bias could also have occurred if the families of asthmatic children had preferentially moved to a home near a freeway, but this seems unlikely. Additionally, our observed associations were robust to adjustment for factors known to be related to population mobility, housing location, and access to care, including race/ethnicity and indicators of socioeconomic status (as well as household characteristics). This robustness further suggests that our results were not the result of these potential confounders.

These results have both scientific and public health implications. They strengthen an emerging body of evidence that air pollution can cause asthma and that traffic-related pollutants that vary within communities are partly responsible for this association. The current regulatory approach that focuses almost exclusively on regional pollutants merits reevaluation in light of this emerging evidence and in light of the enormous costs associated with childhood asthma.<sup>40</sup> In addition, because  $NO_2$  may be a surrogate for the pollutant or pollutants responsible for the observed effects, further study is indicated to identify the specific pollutant(s). In this regard, improved physical and chemical characterization of ambient ultrafine particles (including particle number concentration distributions, as well as more traditional chemical analyses) are topics of specific ongoing research interest in southern California and elsewhere.

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# Paramedic Response Time: Does It Affect Patient Survival?

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# Abstract

Objectives: One marker of quality emergency medical services care is measured by meeting an 8-minute response time guideline. This guideline was based on results of paramedic response times for nontraumatic cardiac arrest patients and has not been studied in unselected patients. The objective of this study was to evaluate the effect of paramedic response time on survival to hospital discharge in unselected patients in a large urban setting while controlling for a number of potentially important confounders, including level of illness severity. Methods: This was a retrospective cohort study performed in an urban 911-based ambulance service system. Patients transported by paramedics to a single urban county teaching hospital from January 1, 1998, to December 31, 1998, were included. Data collected included patient demographics; paramedic response, scene, and transport times; the nature of the medical complaint; and whether the patient survived to hospital discharge. Multivariable logistic regression models were developed using response time as the primary independent variable and survival to hospital discharge as the dependent variable. Covariates included scene time, transport time, age, gender, and level of illness severity. Results: Of 34,111 calls involving emergency response, 11,078 patients (32%)

Paramedic response time to the scene of a call for emergency medical assistance has become a benchmark measure of the quality of the service provided by emergency medical services (EMS) agencies.<sup>1,2</sup> A suggested target response time of  $\leq 8$  minutes for at least 90% of emergent responses has evolved into a were transported to the study institution and 10,382 (94%) had response time data available. Of these, 9,559 patients (92%) had data available to categorize them into groups based on their level of illness severity and were thus included in the study. A survival benefit was identified for response times ≤4 minutes (odds ratio [OR], 0.70; 95% confidence interval [CI] = 0.52 to 0.95). No survival benefit was identified when response time was modeled as a continuous variable (OR, 1.01; 95% CI = 0.98 to 1.04) or when dichotomized at 8 minutes (OR, 1.06; 95% CI = 0.80 to 1.42). Conclusions: A paramedic response time within 8 minutes was not associated with improved survival to hospital discharge after controlling for several important confounders, including level of illness severity. However, a survival benefit was identified when the response time was within 4 minutes for patients with intermediate or high risk of mortality. Adherence to the 8-minute response time guideline in most patients who access out-of-hospital emergency services is not supported by these results. Key words: advanced life support; ambulance response; emergency medical services; paramedic ambulance; response time; response time guideline; survival. ACADEMIC EMERGENCY MEDICINE 2005; 12:594-600.

guideline that has been incorporated into operating agreements for many EMS providers.<sup>3</sup>

This response time guideline has its origin in an article published in 1979 that evaluated patient outcomes after out-of-hospital nontraumatic cardiac arrest.<sup>4</sup> The investigators reported that survival decreased significantly if basic life support and advanced life support were initiated in >4 minutes and >8 minutes, respectively. They therefore suggested these times as recommended guidelines for the emergency response of basic and advanced life support providers. Although that study reported exclusively on outcomes from cardiac arrest, the response time guidelines were subsequently generalized to all emergent responses and to any type of illness or injury.

Since the publication of that initial report, much work has been done to evaluate which interventions provided by basic or advanced life support providers positively affect patient outcomes after nontraumatic cardiac arrest. This resulted in the recognition that an important determinant of survival is the time

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elapsed from onset of cardiac arrest to electrical defibrillation<sup>5–8</sup> and has led to the development and implementation of a variety of programs designed to provide rapid defibrillation.<sup>9–17</sup> As a result, the single most important intervention in the management of the cardiac arrest victim may no longer be dependent on the response time of an ambulance with advanced life support providers. In fact, a recent study reported that the addition of advanced life support procedures did not improve patient survival from cardiac arrest beyond that achieved with rapid defibrillation.<sup>18</sup>

Although the response system to cardiac arrest has evolved over the past two decades, little work has been done to evaluate the continued need for a rigid ambulance response time guideline for patients experiencing other types of medical emergencies. In most EMS systems, cardiac arrest accounts for <1% of calls. Only two studies have been published that have evaluated the effect of the 8-minute response time guideline on something other than cardiac arrest.<sup>19,20</sup> Although both studies identified no outcome difference in patients based on the paramedic response time, the first did not control for illness severity and the second only evaluated outcomes in trauma patients.

The objective of this study was to evaluate the effect of paramedic response time on survival to hospital discharge in unselected patients in a large urban setting while controlling for a number of potentially important confounders, including level of illness severity.

# **METHODS**

**Study Design.** This was a retrospective cohort study performed in an urban 911-based ambulance service system. The study was reviewed by our institutional review board and met criteria for exemption from informed consent requirements.

**Study Setting and Population.** The Paramedic Division of the Denver Health and Hospital Authority is responsible for all 911 emergency ambulance responses for the city and county of Denver, which has a geographic area of approximately 150 square miles and an approximate census of 550,000 based on year 2000 census data. The Paramedic Division responds to approximately 55,000 calls for emergency medical assistance annually using a maximum of 15 paramedic-staffed ambulances at peak staffing and six during lower-demand hours. The division employs approximately 130 paramedics.

We included consecutive patients who required emergent ambulance response to the scene and who were subsequently transported to the emergency department (ED) at Denver Health Medical Center in Denver, CO. Patients were excluded if they were transported to another receiving hospital or refused transport.

**Study Protocol.** Calls for emergency medical assistance are received via 911 at a centralized communications center. All medical calls are referred to Paramedic Division dispatchers, and the dispatchers assign response priorities (emergent vs. nonemergent) based on information obtained from the caller. A paramedic-staffed ambulance is sent to all calls for medical assistance. In addition to advanced life support ambulances, dispatchers also initiate responses by police and fire department first responders as needed based on preexisting protocols.

Denver paramedics initiate care using standardized protocols and standing orders after initial assessment of the patient. Interventions such as intravenous line placement, fluid administration, endotracheal intubation, defibrillation, and pharmacologic interventions can be performed by paramedics before base-station physician contact. Medical oversight is provided by a full-time EMS medical director who is a member of the physician staff of the Department of Emergency Medicine at Denver Health Medical Center. Basestation physician direction is performed by either full-time emergency physician staff or by senior emergency medicine residents.

Using the computerized dispatch log maintained by the Denver Paramedic Division Dispatch Center, all 911 calls to which an ambulance was sent emergently to the scene were identified from January 1, 1998, to December 31, 1998. Data obtained from the dispatch log included the date and time of the 911 call, the EMS call (run) number, the time of arrival to the scene, the time of departure from the scene, the time of arrival to the hospital, the nature of the call as determined by the dispatcher, and whether returning to the hospital was emergent (defined as returning with red lights and sirens) or nonemergent. Response time was defined as the interval (in minutes) from the initiation of the 911 call to the arrival of the ambulance at the scene. Scene time was defined as the interval (in minutes) from arrival of the ambulance at the scene to departure from the scene. Transport time was defined as the interval (in minutes) from departure from the scene to arrival at the hospital.

Data were collected from the paramedic trip report and included patient age, gender, interventions performed in the out-of-hospital setting, and disposition, including transportation to the hospital or pronouncement of death. The paramedic report was then matched with the ED patient log, and each patient's medical record was reviewed to determine disposition from the ED (discharged, admitted to the ward, admitted to the intensive care unit, or died in the ED) as well as survival at the time of discharge from the hospital. All data were obtained by two abstractors using a closed-response data collection instrument. Each abstractor was trained by the principal investigator and met with him bimonthly to maintain quality abstraction and to answer questions. Each abstractor was blinded to the purpose of the study.

**Data Analysis.** All data were entered into an electronic database (SPSS release 11.0; SPSS Inc., Chicago, IL) and converted into native SAS format using translational software (dfPower DBMS/Copy; Data-Flux Corp., Cary, NC). All statistical analyses were performed using SAS (version 8.2; SAS Institute Inc., Cary, NC).

Descriptive statistics were performed for all variables. Continuous data are reported as medians with interquartile ranges (IQRs), and categorical data are reported as percentages with 95% confidence intervals (CIs). Bivariate statistical testing was performed using the Wilcoxon rank sum test or Fisher's exact test, where appropriate. Missing values were imputed using multiple imputation procedures in SAS (PROC MI and PROC MIANALYZE). Imputation is a statistical technique that replaces each missing value in a data set with a plausible value based on known characteristics of the data set. This allows all observations, including those that would have been excluded due to missing values, to be included in the analysis and to make an unbiased estimate of the effect measures.<sup>21</sup> Multivariable logistic regression analysis was performed to assess the effect of paramedic response time on survival to hospital discharge, while controlling for age, gender, scene time, transport time, and three levels of medical acuity (categorized as low risk for mortality, intermediate risk for mortality, or high risk for mortality based on the dispatch nature code and the ED diagnosis) as potential confounders. The high-risk group included all traumatic and nontraumatic cardiac arrest patients. The intermediate-risk group included all suicide attempts, accidental exposures (defined by exposure to toxins or environmental exposures), unconscious patients, those with penetrating trauma, those with any respiratory complaints, or those who were hypotensive (defined by a systolic blood pressure  $\leq 90 \text{ mm}$ Hg) in the out-of-hospital setting.<sup>22</sup> All other patients were grouped into the low-risk category. Categories were defined by two investigators (PTP and JSH) using a consensus process before performing the analysis. Three separate multivariable logistic regression analyses were performed. The primary independent variable, response time, was modeled as a continuous variable and then as two categorical variables (one model with a 4-minute cutoff point and another model with an 8-minute cutoff point). To assess the effect of response time on survival in patients not experiencing trauma or cardiac arrest, subgroup analyses of medical noncardiac arrest patients were performed while controlling for the same confounders. Logistic regression model diagnostics

were performed, the need for variable transformation was assessed, and all possible interaction terms were evaluated for inclusion into each model. Odds ratios (ORs) and 95% CIs are reported where appropriate. No adjustments were made for multiple comparisons.

# RESULTS

During the study period, Denver paramedics responded to 49,851 calls for medical assistance. Of these, 34,111 (68%) involved emergent response to the scene. Of the 34,111 calls involving emergency response, 11,078 (32%) were transported to Denver Health Medical Center and 10,382 (94%) had response time data available. Of these, 9,559 patients (92%) had data available to categorize them as low risk (n = 6,696), intermediate risk (n = 2,619), or high risk (n = 244) for mortality and were thus included in the study. Of the 9,559 patients, transport time was missing in 561 cases (6%), age was missing in 83 cases (0.9%), and gender was missing in 12 cases (0.1%). All other variables had complete data.

The median age for the entire cohort was 38 years (IQR, 26–50 years; range, 1–99 years); of 9,547 patients for whom data were available, 5,936 (62%) were male. The median response time was 5.8 minutes (IQR, 4.3-7.7 minutes), the median scene time was 10.8 minutes (IQR, 7.5–14.8 minutes), and the median transport time was 7.7 minutes (IQR, 4.8-11.4 minutes). Of the 9,559 patients, 8,827 (92%) survived to hospital discharge. Of the 6,696 patients categorized into the low-risk group, 6,650 (99%) survived to hospital discharge; of the 2,619 patients categorized into the intermediate-risk group, 2,169 (83%) survived to hospital discharge; and of the 244 patients categorized into the high-risk group, eight (3%) survived to hospital discharge (p = 0.0001). Figure 1 shows patient survival percentages by response time when stratified by the three risk groups.

All emergent responses to the scene were evaluated to determine if a response time >8 minutes resulted in more patients being pronounced dead at the scene and therefore not transported to the hospital. Of the 24,932 patients in which the response time was  $\leq 8$  minutes, 421 (1.7%; 95% CI = 1.5% to 2.0%) were pronounced dead and not transported to the hospital. Of the 9,179 patients in which the response time was >8 minutes, 159 (1.7%; 95% CI = 1.5% to 1.9%) were pronounced dead and not transported to the hospital.

When response time was modeled as a continuous variable while controlling for scene time, transport time, patient age and gender, and level of illness severity, there was no effect on patient survival to hospital discharge (OR, 1.01; 95% CI = 0.98 to 1.04) (Table 1). Descriptive statistics for variables included in the model in which response time was categorized as  $\leq$ 4 minutes or >4 minutes are shown in Table 2. In this case, a survival benefit was identified when response time was  $\leq$ 4 minutes (OR, 0.70; 95%)



Figure 1. Percentages of survival to hospital discharge by paramedic response time and stratified by risk groups (bars represent 95% Cls). All patients were categorized into low-risk ( $\bullet$ ), intermediate-risk ( $\bigcirc$ ), or high-risk ( $\blacktriangledown$ ) groups. The high-risk group included all traumatic and nontraumatic cardiac arrest patients. The intermediate-risk group included all suicide attempts, accidental exposures, unconscious patients, those with penetrating trauma, those with respiratory complaints, and those who were hypotensive in the out-of-hospital setting. All other patients were grouped into the low-risk category. \*Cls were not calculated for these response times due to sparse data.

CI = 0.52 to 0.95) (Table 1). This effect is seen graphically in Figure 1. Descriptive statistics for variables included in the model in which response time was categorized as  $\leq 8$  minutes or >8 minutes are shown in Table 3. There was no effect on patient survival to hospital discharge based on the 8-minute cutoff point (OR, 1.06; 95% CI = 0.80 to 1.42) (Table 1).

After including only medical noncardiac arrest patients (n = 5,062) in separate subgroup analyses, the effect of response time did not significantly change when modeled as a continuous variable (OR, 1.01; 95% CI = 0.98 to 1.05), categorized by the 4-minute cutoff point (OR, 0.56; 95% CI = 0.38 to 0.83), or categorized by the 8-minute cutoff point (OR, 1.08; 95% CI = 0.77 to 1.52).

# DISCUSSION

The 8-minute response time recommendation was developed with the goal of optimizing survival from nontraumatic cardiac arrest. Little work has been done to determine if this response time goal is appropriate for the other 99% of emergencies for which EMS providers respond. The results of this study suggest that response times >4 minutes do not influence mortality in unselected patients while controlling for scene time, transport time, patient age and gender, and varying levels of illness severity, including cardiac arrest. There does appear to be a survival advantage for patients in instances where paramedics respond within 4 minutes. It is unclear, however, which patients besides those experiencing cardiac arrest benefit from such a brief response time, and this was not specifically evaluated in this study.

The results of this study indirectly support those studies that have evaluated the time difference between emergent and nonemergent ambulance response or transport times.<sup>23–28</sup> These studies have demonstrated a relatively modest time savings of 1–4 minutes when comparing emergent responses with nonemergent responses. If, as the results of this study suggest, there is no effect of paramedic response time on patient outcomes, then more ambulances may be sent to calls for medical assistance nonemergently, thus minimizing the intrinsic risk of emergent response without increasing risk for morbidity or mortality for the patient.

The majority of research evaluating paramedic response times has been conducted in two general groups of patients, namely those experiencing cardiac arrest or those with traumatic injuries. Although field times are commonly reported in articles describing studies involving victims of traumatic injury, few studies have attempted to analyze the effect of response time on patient outcomes. Several studies, however, have evaluated the effect of total outof-hospital time on survival following blunt or penetrating trauma. In each case, no survival advantage was identified for those patients who had shorter outof-hospital times.<sup>29–31</sup> We previously evaluated a heterogeneous group of consecutive trauma patients for whom an ambulance responded emergently and found no difference in patient outcome based on the ambulance response time.<sup>20</sup>

To our knowledge, only one published study has previously evaluated paramedic response time on survival in a group of patients with unselected medical problems. Blackwell and Kaufman evaluated more than 5,000 patients using the response time criterion in place for their EMS system and found the mortality curve flattened for response times >5 minutes.<sup>19</sup> This study did not, however, account for potential confounders, including illness severity.

A reevaluation of the current 8-minute ambulance response time guideline is particularly important, because today's EMS systems are significantly different when compared with EMS systems from 10 or 20 years ago. This guideline resulted directly from the desire to improve outcomes from nontraumatic cardiac arrest by decreasing times to defibrillation. In the past, first responders provided basic life support, which consisted of performing closed chest cardiac massage and bag-valve-mask ventilation but involved few, if any, advanced interventions such as cardiac rhythm

	Response Tii	Response Time as a Continuous Variable*		Vlinute Cut Point†	8-Minute Cut Point‡	
Variables	OR	95% CI	OR	95% CI	OR	95% CI
Response time	1.01	0.98, 1.04	0.70	0.52, 0.95	1.06	0.80, 1.42
Scene time	1.22	1.20, 1.25	1.22	1.20, 1.24	1.22	1.20, 1.24
Transport time	1.06	1.03, 1.10	1.07	1.04, 1.10	1.05	1.02, 1.09
Age	0.95	0.94, 0.96	0.95	0.94, 0.96	0.95	0.94, 0.96
Gender	0.65	0.51, 0.84	0.64	0.50, 0.83	0.65	0.50, 0.83
Intermediate risk§	0.05	0.04, 0.06	0.05	0.03, 0.06	0.05	0.03, 0.06
High risk§	0.001	0.0004, 0.003	0.001	0.0004, 0.003	0.001	0.0004, 0.003

# TABLE 1. Logistic Regression Analyses to Model Paramedic Response Time as a Predictor for Survival to Hospital Discharge

\*Response time as a continuous variable. The Hosmer–Lemeshow goodness-of-fit statistic was 0.97, which indicates an adequate fit. †Response time categorized as  $\leq$ 4 (referent) or >4 minutes. The Hosmer–Lemeshow goodness-of-fit statistic was 0.97, which indicates an adequate fit.

 $\pm$ Response time categorized as  $\leq$ 8 (referent) or >8 minutes. The Hosmer–Lemeshow goodness-of-fit statistic was 0.89, which indicates an adequate fit.

§All patients were categorized into low-, intermediate-, or high-risk groups. The high-risk group included all traumatic and nontraumatic cardiac arrest patients. The intermediate-risk group included all suicide attempts, accidental exposures, unconscious patients, those with penetrating trauma, those with respiratory complaints, and those who were hypotensive in the out-of-hospital setting. All other patients were grouped into the low-risk (referent) category.

determination, manual defibrillation, endotracheal intubation, or pharmacologic therapy. These procedures were generally reserved for and provided by paramedics responding on advanced life support ambulances.

Technological advances have changed the paradigm for emergency response to victims of cardiac arrest. The development of automated external defibrillators has permitted the development and implementation of programs that allow first responders and laypersons

# TABLE 2. Characteristics for Paramedic ResponseTime Groups Based on the 4-Minute ResponseTime Criterion

	Response Time (min)			
Variables	≤4 ( <i>n</i> = 2,036)	>4 (n = 7,523)	p-value	
Age (yr)	38 (26–49)	37 (25–50)	0.32	
Response time				
(min)	3.2 (2.6–3.6)	6.5 (5.3–8.3)	< 0.0001	
Scene time				
(min)	11.0 (7.8–14.9)	10.6 (7.3–14.6)	0.003	
Transport time				
(min)	6.0 (3.8–8.6)	8.3 (5.3–12.1)	< 0.0001	
Gender (male)	65% (1,327/2,033)	61% (4,609/7,514)	0.001	
Survival to				
hospital				
discharge	94% (1,909)	92% (6,918)	0.006	
Risk group*				
Low	72% (1,465)	70% (5,231)	0.1	
Intermediate	26% (524)	28% (2,095)		
High	2% (47)	3% (197)		

All continuous data are reported as medians with interquartile ranges.

\*All patients were categorized into low-, intermediate-, or highrisk groups. The high-risk group included all traumatic and nontraumatic cardiac arrest patients. The intermediate-risk group included all suicide attempts, accidental exposures, unconscious patients, those with penetrating trauma, those with respiratory complaints, and those who were hypotensive in the out-of-hospital setting. All other patients were grouped into the low-risk category. with minimal or no training to defibrillate cardiac arrest victims.<sup>5,9,10,12–14</sup> This has allowed the procedure of defibrillation to be moved to a health care delivery point that precedes the direct involvement of the EMS system.<sup>16</sup> This profound change in some ways diminishes the importance of rapid response by advanced life support ambulances. Despite this change, no work has been done to reevaluate the need for the response time guideline currently in use.

# TABLE 3. Characteristics for Paramedic Response Time Groups Based on the 8-Minute Response Time Criterion

	Response Time (min)			
Variables	≤8 ( <i>n</i> = 7,475)	>8 ( <i>n</i> = 2,084)	p-value	
Age (yr) Response time	38 (26–49)	37 (25–50)	0.23	
(min) Scene time	5.1 (3.9–6.4)	9.8 (8.8–11.7)	< 0.0001	
(min)	10.9 (7.7–14.9)	9.8 (6.2–13.9)	< 0.0001	
(min)	7.1 (4.5–10.4)	10.5 (7–14.9)	< 0.0001	
Gender (male) Survival to	63% (4,696/7,467)	60% (1,240/2,080)	0.007	
discharge Risk groups*	93% (6,928)	91% (1,899)	0.02	
Low Intermediate High	70% (5,241) 28% (2,057) 2% (177)	70% (1,455) 27% (562) 3% (67)	0.09	

All continuous data are reported as medians with interquartile ranges.

\*All patients were categorized into low-, intermediate-, or highrisk groups. The high-risk group included all traumatic and nontraumatic cardiac arrest patients. The intermediate-risk group included all suicide attempts, accidental exposures, unconscious patients, those with penetrating trauma, those with respiratory complaints, and those who were hypotensive in the out-of-hospital setting. All other patients were grouped into the low-risk category.

The survival curve presented in this study raises the question of what should be recommended as the paramedic response time guideline. A number of factors must be assessed and known before this question can be answered. First, we need to know what, if anything, besides defibrillation contributes to patient survival in the out-of-hospital setting. Currently, no evidence exists that documents the benefit of any other out-of-hospital intervention currently provided by emergency medical technicians of all levels. Second, it is necessary to determine where in the sequence of response and care the intervention is best provided. Is it best performed by the first responder, the providers on the transporting ambulance, or, as has become the case with defibrillation, the layperson rescuer? Finally, difficult as it may be, a complete cost-benefit analysis must be accomplished to fully analyze the financial impact of further decreasing the response time interval. Although ambulance response times may be optimized through critical analyses of demand, time of day, traffic flow patterns, and ambulance posting locations,<sup>23,32–36</sup> significant changes usually require additional ambulances and often in significant numbers. At an approximate cost per staffed ambulance of \$500,000 annually, the financial impact may be enormous.

It has been suggested that a better measure of EMS system performance is measurement from onset of the medical incident to the intervention.<sup>37</sup> Unfortunately, this concept has not gained widespread acceptance. Paramedic response time is one component of this longer time interval, which generally begins when the ambulance unit has been assigned and dispatched and ends when paramedics arrive at the patient's side. In reality, the interval for medical response includes the time to discovery of the patient after the onset of the medical incident, the time to recognition that emergency medical assistance is needed, the time to access and communicate with the emergency response system, the ambulance response time itself, and the time from arrival of the ambulance at the scene to direct patient contact.<sup>38-41</sup> Clearly, minimizing the delay involved with each of these steps is essential to maximizing survival from out-of-hospital cardiac arrest; however, the only step measured and commonly reported is ambulance response time.

# LIMITATIONS

This study has a number of limitations. Data collection was performed retrospectively and was dependent on the computerized dispatch program to identify those cases for which an ambulance responded emergently. The accuracy of dispatch coding was not evaluated, and it is possible that cases in which the response mode was changed en route were not identified. In addition, our cohort was composed of patients transported to a single Level 1 trauma center. The overall study population, therefore, most likely represented a larger proportion of trauma patients. In addition, the cases were stratified into risk categories based on the nature of the emergency as determined by the dispatch call taker and the ED diagnosis. It is possible that the actual nature of the medical emergency was different from that assigned by the call taker or the ED diagnosis. Linkage of the ambulance trip report with patient medical records was dependent on a manual search and matching of demographic information. This resulted in incomplete or missing data in some cases. This study included patients for whom the EMS system responded emergently and who were transported to our hospital. As a result, patients who refused transport were excluded from this study. This exclusion most likely resulted in an overall higher acuity for the patients included in our study, thus potentially biasing our results toward identifying a significant effect on patient survival.

Finally, we used survival to hospital discharge as the primary outcome measure for this study because it is a commonly used outcome measure that allows relatively easy comparisons to be made between studies. Other measures such as functional status, costs of medical care, and intensive care unit or hospital length of stay are also appropriate measures of the benefit of EMS response. These, however, were not evaluated in this study.

# CONCLUSIONS

A paramedic response time  $\leq 8$  minutes was not associated with survival to hospital discharge after controlling for several important confounders, including level of illness severity. However, a survival benefit was identified when the response time was  $\leq 4$  minutes. Adherence to the 8-minute response time guideline in most patients who access out-of-hospital emergency services is not supported by these results. Identification of patients, besides those who experience cardiac arrest, who may benefit from a short response time is required to provide effective and safe out-of-hospital care.

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