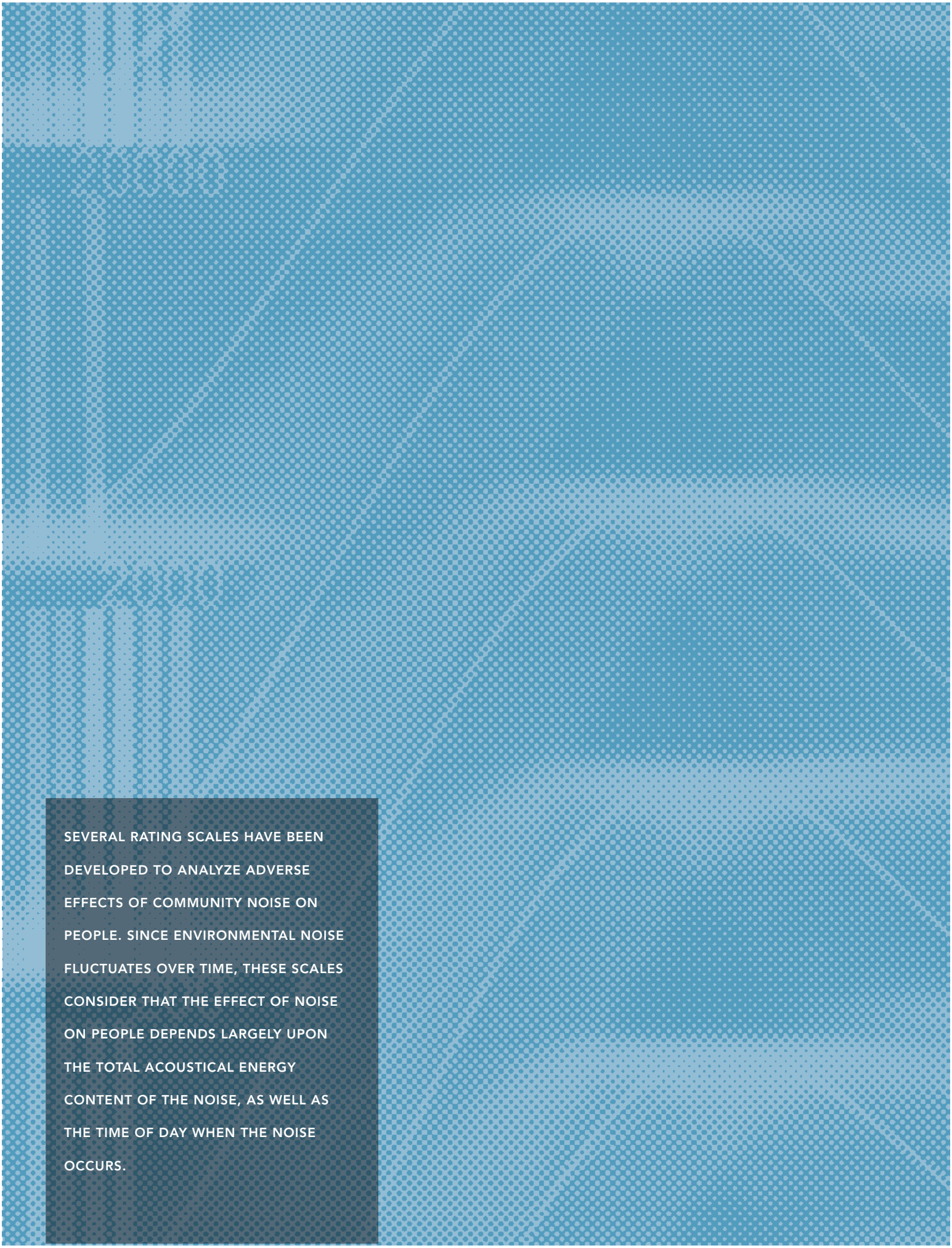

SEVERAL RATING SCALES HAVE BEEN DEVELOPED TO ANALYZE ADVERSE EFFECTS OF COMMUNITY NOISE ON PEOPLE. SINCE ENVIRONMENTAL NOISE FLUCTUATES OVER TIME, THESE SCALES CONSIDER THAT THE EFFECT OF NOISE ON PEOPLE DEPENDS LARGELY UPON THE TOTAL ACOUSTICAL ENERGY CONTENT OF THE NOISE, AS WELL AS THE TIME OF DAY WHEN THE NOISE OCCURS.

characteristics of sound

SOUND IS A PRESSURE WAVE TRANSMITTED THROUGH THE AIR. IT IS described in terms of loudness or amplitude (measured in decibels), frequency or pitch (measured in hertz [Hz] or cycles per second), and duration (measured in seconds or minutes). The decibel (dB) scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound. "Logarithmic" is a scale of measurement in which an increase of one unit represents a tenfold change in the quantity measured. The pitch of the sound is related to the frequency of the pressure vibration. Because the human ear is not equally sensitive to all frequencies, a special frequency-dependent rating scale is used to relate noise to human sensitivity. The A-weighted decibel scale (dBA) provides this compensation by discriminating against upper and lower frequencies in a manner approximating the sensitivity of the human ear. The scale is based on a reference pressure level of 20 micropascals (zero dBA). The scale ranges from zero (for the average least perceptible sound) to about 130 (for the average human pain level).

The normal range of conversation is between 34 and 66 dBA. Between 70 and 90 dBA, sound is distracting and presents an obstacle to conversation, thinking, or learning. Above 90 dBA, sound can cause permanent hearing loss. Examples of various sound levels in different environments are shown in Table A-1 (Typical Sound Levels).

TABLE A-1 TYPICAL SOUND LEVELS		
Common Sounds	*A-Weighted Sound Level in Decibels*	*Subjective Impression*
Oxygen Torch	120	Pain Threshold
Rock Band	110	
Pile Driver at 50 feet	100	Very Loud
Ambulance Siren at 100 feet	90	
Garbage disposal	80	
Vacuum Cleaner at 10 feet	70	Moderately Loud
Air Conditioner at 100 feet	60	
Quiet Urban Daytime	50	
Quiet Urban Nighttime	40	Quiet
Bedroom at Night	30	
Recording Studio	20	Just Audible
	10	Threshold of Hearing
	0	

Source: Aviation Planning Associates. 1978. Calculations of Maximum A-weighted Sound Levels (dBA) Resulting from Civil Aircraft Operations.

A noise environment consists of a base of steady "background" noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These local sources can vary from an occasional aircraft or train passing by to virtually continuous noise from, for example, traffic on a major highway. To the human ear, a sound that is 10 dBA higher than another is judged to be twice as loud; 20 dBA higher is four times as loud; and so forth. In general, a difference of more than 3 dBA is a perceptible change in environmental noise, while a 5 dBA difference typically causes a change in community reaction, and an increase of 10 dBA is perceived by people as doubling of loudness.

Noise Measurement Scales

Several rating scales have been developed to analyze adverse effects of community noise on people. Since environmental noise fluctuates over time, these scales consider that the effect of noise on people depends largely upon the total acoustical energy content of the noise, as well as the time of day when the noise occurs. Those that are applicable to looking at freight-related issues in communities are as follows:

- L_{eq}, the equivalent noise level, is an average of sound level over a defined time period (such as 1 minute, 15 minutes, 1 hour, or 24 hours). Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure.
- L_{90} is a noise level that is exceeded 90 percent of the time at a given location; it is often used as a measure of "background" noise.
- CNEL, the Community Noise Equivalent Level, is a 24-hour average L_{eq} with a 5 dBA "penalty" added to noise during the hours of 7:00 p.m. to 10:00 p.m., and a 10 dBA penalty added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and night-time. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.
- L_{dn}, the day-night average noise, is a 24-hour average L_{eq} with an additional 10 dBA "penalty" added to noise that occurs between 10 p.m. and 7 a.m. The Ldn metric yields similar values (within 1 dBA) as do the CNEL metric. As a matter of practice, Ldn and CNEL values are considered to be equivalent and are treated as such in this assessment.

Noise Attenuation

The noise level from a particular source generally declines as the distance to the receptor increases. Other factors such as the weather and reflecting or shielding also intensify or reduce the noise level at any given location. Typically, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA. Exterior noise levels can normally be reduced by 15 dBA inside buildings constructed with no special noise insulation. The U.S. EPA estimates that residences in "warm" climates provide at least 12 dBA of exterior-to-interior noise attenuation with windows open and 24 dBA with windows closed.

Noise from traffic on roads depends on the volume and speed of traffic and the distance from the traffic. A commonly used rule of thumb for traffic noise is that for every doubling of distance from the road, atmospheric spreading over "hard" or "soft" sites reduces the noise level by about 3 or 4.5 dBA, respectively. For a stationary source, the noise is reduced by at least 6 dBA for each doubling of distance. Further, because of the logarithmic nature of the decibel scale, a doubling of traffic on any given roadway or doubling a stationary source would cause a noise increase of approximately 3 dBA.

Environmental Justice Analysis and Outreach Study

SUMMARY REPORT: PROCESS AND OUTCOMES

Prepared for:

California Department of Transportation

Los Angeles County Metropolitan Transportation Authority

Riverside County Transportation Commission

San Bernardino Associated Governments

Prepared by:

MIG, Inc.

ICF International

In association with UltraSystems

MARCH 30, 2009

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introduction

Southern California is our nation's largest and most important center for transferring and moving merchandise from container ships to people throughout the country. It is an international gateway for foreign trade. This area connects cities throughout the country to manufacturers and markets in Asia and Mexico. "Goods movement", put simply, is the transfer of merchandise from one location to another location. But the moving parts are many and complex.

Millions of Southern California residents and businesses purchase merchandise and thousands of manufacturers produce goods for U.S. and international consumption. The result: a massive goods movement network or infrastructure, including ports, airports, railyards, and distribution centers, connected by a large system of truck routes and rail lines.

Goods movement benefits the economy of the area by supporting hundreds of thousands of jobs and providing state and local tax revenues. But goods movement also has negative effects, causing air pollution, noise, traffic jams, safety problems, and visual blight. These impacts are most felt by people who live near cargo centers, freeways, and railways—and these communities are predominantly low-income and minority, raising concerns about environmental justice.

The Southern California Association of Governments (SCAG) estimates that, over the next 20 years, overall freight volumes in the region will at least double and possibly triple. This will elevate the region's status as the most important gateway for international trade and the importance of goods movement to the region's economy and overall prosperity, but will also increase impacts on our environmental justice communities. What can be done to better understand the impacts experienced by these communities? What are the potential solutions that can be applied to these impacts? What roles can the full range of stakeholders have in these solutions? How can all of these stakeholders—including community members, industry representatives, public agencies, and more—work together to reduce these impacts and preserve or improve quality-of-life, all while supporting an important economic engine for the region?

STUDY OVERVIEW

The purpose of the Environmental Justice Analysis and Community Outreach Study was (a) to expand the region's understanding of goods movement impacts on communities of concern, and (b) to identify strategies for the region and within prototype communities to address these impacts and maintain or enhance quality-of-life, all while supporting the expansion of goods movement.

The Study objectives included:

- Creating meaningful environmental justice and goods movement information for the Southern California region
- Combining community insight and experiences with goods movement impacts in environmental justice communities with the latest and best data about impacts and mitigation strategies
- Creating a practical "toolkit" for use among all stakeholders—particularly community members—that:
    - addresses regional and localized needs;
    - is grounded in current data;
    - produces measurable and lasting results;
    - and is updateable in the future.

The Study represented a partnership of Southern California transportation and regional planning agencies including Caltrans Districts 8 and 12, Riverside County Transportation Commission, Los

Angeles County Metropolitan Transportation Authority, and San Bernardino Associated Governments. The Study team of consultants led by MIG, Inc. included ICF International and UltraSystems. The Study was funded by a Caltrans Environmental Justice Planning Grant.

APPROACH AND PROCESS OVERVIEW

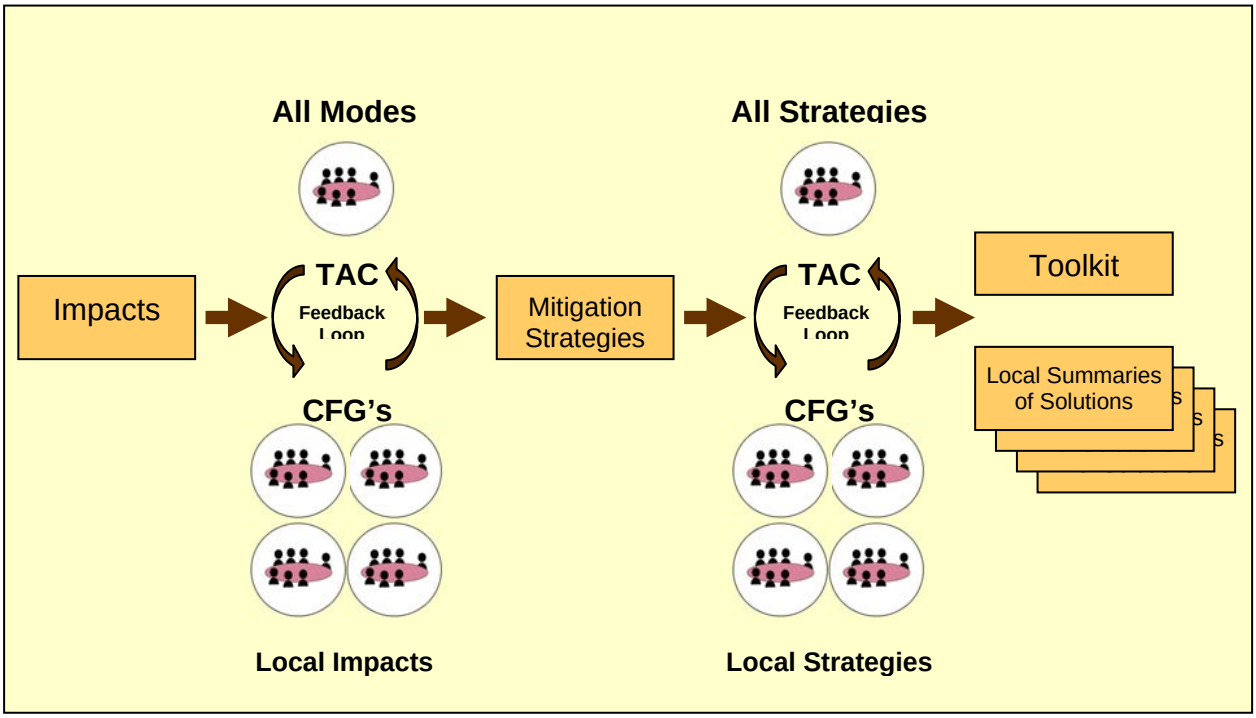
The Study approach integrated technical analyses from recently-developed plans such as the Multi-County Goods Movement Action Plan (MCGMAP) and best practices and solutions for environmental justice issues, all of which was coordinated with a broad-based community outreach approach involving technical experts and representatives of impacted communities.

- A **Technical Advisory Committee (TAC)** of experts and community representatives provided overall guidance to the study team in developing data and outcomes. Members included representatives of the participating transportation commissions, staff from local agencies including planning, public works and public health, representatives of goods movement industries, and community members involved in the Study's localized analysis of goods movement impacts in case study communities.
- A total of four (4) **Community Feedback Groups (CFGs)** of experts and community representatives—one group for each case study community—also provided guidance to the Study's localized analysis of goods movement impacts. Membership in each CFG was similar to the TAC, but focused on localized stakeholders. Some CFG members also served on the TAC, though all CFG members were invited to do so.

The TAC and CFGs guided the Study process in a continuous feedback loop that is summarized simply in the following steps:

- Identifying environmental justice communities
- Conducting an impacts analysis
- Identifying strategies and solutions
- Creating the "toolkit"

Following is a simplified graphic depiction of this process, and a more detailed description follows thereafter. A more detailed graphic depiction of the process is available at the end of this report.



Identifying Environmental Justice and Case Study Communities

Early in the process, the Study team conducted **initial consultations** with staff from the represented transportation commission agencies and stakeholders with a keen understanding of goods movement in their respective communities. The consultations provided early insight as to known goods movement facilities in their counties, as well as specific communities who may be considered environmental justice communities and experience disproportionate impacts.

The Study team **collected and mapped demographic data** for the Southern California region based on minority and low-income status, and applied the data in geographic information system (GIS) format. In this format, the data appeared in transportation analysis zones, or TAZs, which are defined geographic boundaries throughout the region. The TAZs were at a small enough scale to allow the Study team to view where environmental justice communities exist on maps of the region.

The Southern California region is one of the most diverse in both income and ethnicity. As such, and due to the relatively high cost of living, the Study team recommended use of TAZs that are greater than the regional average. With the minority population representing approximately 63% of the total population (2000 U.S. Census), the Study team recommended the following criteria to identify three levels of minority TAZs:

- 70-79% of the total population is minority
- 80-89% of the total population is minority
- Over 90% of the total population is minority

The Study team also recommended the following criteria to identify three levels of low-income TAZs:

- 30-39% of households have an income below $25,000
- 40-49% of households have an income below $25,000
- More than 50% of households have an income below $25,000

The minority criteria resulted in selection of 41% of all SCAG TAZs, and the low income criteria resulted in selection of 38% of all SCAG TAZs.

The Study team then applied this data against the emerging data and recommendations from the **Multi-County Goods Movement Action Plan (MCGMAP)**, a multi-jurisdictional effort in the same study area. The MCGMAP is the "Master Plan" for the study area, representing a regional consensus-based framework for goods movement initiatives, including planned improvements, public policy and legislation regarding mitigation strategies, and funding and institutional arrangements. The Study team also reviewed the project applications for Trade Corridor Improvement Funds from each county transportation commissions to assess their locations related to identified environmental justice communities. As these projects are imminent and require development of mitigation strategies, the Study offered a unique opportunity to support those projects.

With feedback and guidance from the TAC, this collection of data and additional coordination and discussions with local communities by transportation commission staff led to identification of the following case study communities that represent the Study's Community Feedback Groups and their respective impacts for study:

- **Coachella Valley**, Riverside County:
    - The majority of the corridor features over 90% minority populations and more than 50% of households with income below $25,000
    - Primary impacts: Emerging truck traffic on local highways, and potential development of an inland port centered on the local airport
- **Mira Loma**, Riverside County:

  - The adjacent communities include neighborhoods with 40-49% of households with incomes below $25,000, and other neighborhoods with incomes with more than 50% of households below $25,000
  - Primary impacts: Rail yard and rail operation impacts, truck traffic on local streets, and warehouse and distribution centers
- City of Colton, San Bernardino County:
  - Many neighborhoods near goods movement facilities feature 30-39% of households with income below $25,000, and 80-89% of the population are minorities
  - Primary impacts: Rail line noise and street crossings
- City of South Gate, Los Angeles County:
  - With a population of over 100,000, more than 90% of its residents are minorities and many pockets of the City have 30%-50% of households with incomes under $25,000
  - Primary impacts: Truck traffic on local streets, and warehouse and distribution centers

Conducting an Impacts Analysis

The purpose of the analysis was to summarize the best available data about the types of impacts from each goods movement facility type. The data provided a framework for identifying potential strategies and solutions that are best addressed at the local community level. The analysis organized data in the following structure:

- Economic
- Truck Routes
- Rail Lines
- Railyards
- Warehouses and Distribution Centers
- Ports

Additionally, the CFGs identified localized impacts from goods movement based on local experiences. Both the CFGs and the TAC provided feedback regarding the analysis outcomes and how to incorporate the data in the toolkit.

Identifying Strategies and Solutions

Based on the impacts analysis, the Study team provided the TAC and CFGs with **initial options for mitigation strategies**, which provided a framework for what strategies and solutions could be developed in detail as part of the toolkit, as well as those most pertinent to the CFGs' respective impacts.

After confirming the options for mitigation strategies, the Study team developed **detailed strategies**, providing general descriptions, benefits, challenges, and cost data for each strategy. Also included were more specific action steps that could be taken, as well as the potential partners and relative implementation timeframes and cost ranges. At the same time, the CFGs developed localized strategies for their respective impacts, which also informed development of the detailed strategies in the toolkit.

Creating the "Toolkit"

To bring all of the Study's work together, the Study team created the Toolkit, more formally titled: "Healthy Communities and Healthy Economies: A Toolkit for Goods Movement." Throughout the Study process, the Study team developed and refined an outline for the toolkit based on feedback from the TAC and CFGs. The Toolkit was structured as follows:

- Foreword: how to use the Toolkit
- Introduction: basic information about the goods movement system
- Economic impacts: benefits and jobs for the region
- Truck routes: description and impacts
- Rail lines: description and impacts
- Railyards: description and impacts

- Warehouses and distribution centers: description and impacts
- Ports: description and impacts
- Mitigation strategies: description and impacts
- How to get involved
- Where to go for more information

The TAC and CFGs reviewed two content drafts (data and information) followed by a final design draft (fully formatted with revisions from the content drafts). The Study's partner agencies provided final reviews prior to submitting to Caltrans as part of the grant requirements and distributing to local communities.

SUMMARY OF LOCALIZED STRATEGIES AND SOLUTIONS

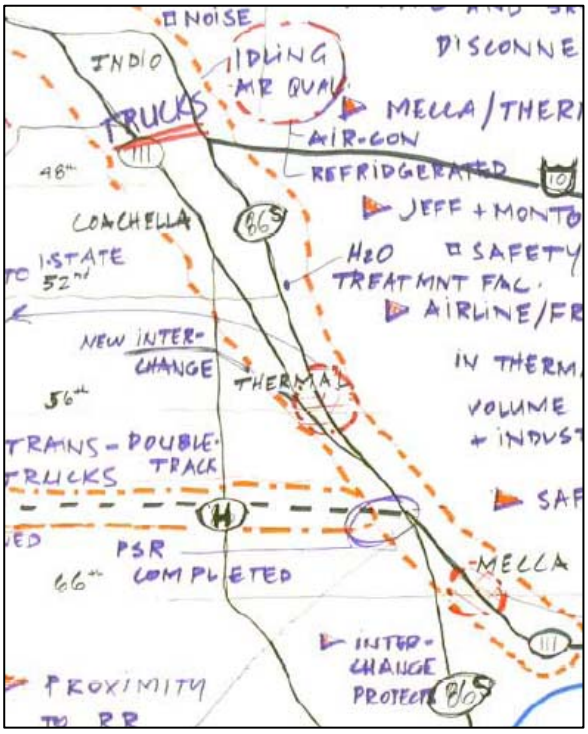
The remaining portion of this report summarizes the potential strategies and solutions developed within the CFGs as part of this process. Overall, each CFG developed a range of strategies and solutions to address their respective impacts as follows:

- **Coachella Valley**, Riverside County: Emerging truck traffic on local highways, and potential development of an inland port
- **Mira Loma**, Riverside County: Railyard and rail operation impacts, truck traffic on local streets, and warehouse and distribution centers
- **City of Colton**, San Bernardino County: Rail line noise, and safety at street crossings
- **City of South Gate**, Los Angeles County: Truck traffic on local streets, and warehouse and distribution centers

COACHELLA VALLEY
Riverside County

Description
Situated in the far eastern area of Riverside County, the Coachella Valley is relatively removed from core areas of goods movement activity in Southern California. However, the area does have its share of goods movement facilities, and local stakeholders have seen their growth over time.

Specifically, State Route 86S (a.k.a. the "NAFTA Corridor") is identified as an important, growing highway facility for freight trucks connecting the U.S., Mexico and Canada. Additionally, State Route 111 and a parallel rail line, and nearby Interstate 10, a high-volume highway, are also key parts of the local network for goods movement. Furthermore, the Jacqueline Cochran Regional Airport in the County of Riverside may expand to become a significant inland port, potentially with the growth of supporting warehousing uses nearby.



Portion of the wallgraphic from Coachella Valley Community Feedback Group Meeting #1

Impacts
Overall, given the anticipated growth of goods movement on local highways and potentially of an inland port at the Cochran Airport, as well as the likely growth of residential areas, the Coachella Valley CFG identified impacts that reflect current experiences, as well as anticipated experiences in the future. The CFG recognized that currently the Coachella Valley does not experience the same level of impacts as other communities in the region, such as Mira Loma. However, the possible growth of the local goods movement system has the potential of imposing many new burdens.

Specifically, over the course of four meetings, the CFG identified the following perceptions about impacts and concerns that may become more significant over time due to growth of goods movement:

- Expanding airport operations for goods movement that:
  - Increase air quality impacts
  - Develop more industrial, warehousing or distribution centers potentially adjacent to residential areas
  - Increase traffic congestion on local streets
  - Potentially limit job development opportunities by precluding other uses of the land that might offer more or better jobs.
- Increasing traffic congestion on local highways that:
  - Increase air quality impacts
  - Contribute to increasing traffic congestion on local streets
  - Reduce traffic safety levels, particularly with under-developed interchanges and railroad crossings
- Increasing railroad traffic that:
  - Increase the chance for accidents at street crossings
  - Block access to some local communities at times, including first responders
  - Increase chances of spilling hazardous materials

Potential Local Strategies and Partners

Following are local strategies and potential partners organized by goods movement mode as identified by the CFG and recommended for consideration by the Study team. Also noted are estimates for the number of years and relative cost that may be necessary for implementation of each strategy.

A general guide to the range of costs is as follows:

$: less than $10,000
$$: $10,001 – $100,000
$$$: $100,001 – $1 million
$$$$: greater than $1 million

A general guide to the relative timeframe to implement strategies is as follows:

Short: 0–5 years
Mid: 5–10 years
Long: 10+ years

INLAND PORT AND WAREHOUSING

Strategies	*Timeframe*	*Relative Cost*
Engage the region regarding a vision for potentially developing an inland port with clear data about impacts and benefits. Potential Partners: Airport authority, local cities, county, CVAG	Short	$$
Study economic impacts and cost/benefit data—particularly related jobs—from inland port and warehousing development versus other uses. Potential Partners: CVAG, County	Short	$$
Develop localized air quality data, and forecast potential impacts from port development. Potential Partners: SCAQMD, County, CVAG	Short	$$
Refine land use zoning to ensure that incompatible uses are separated by appropriate buffers in next General Plan Update, as needed. Potential Partners: County	Short	$$
Study opportunities for off-peak scheduling at inland port facilities and warehouses to minimize daytime impacts on local communities. Potential Partners: Airport, County, CVAG	Short	$$
For new projects, require noise-generating activities or equipment to be located away from adjacent sensitive land uses such as homes, schools and hospitals. Potential Partners: County, local cities, operators	Short	$
For existing and new projects, facilitate communication between facility operators and local communities to build mutual awareness of operational needs, impact concerns, and potential solutions. Potential Partners: County, cities, facility operators	Short	$
Require new distribution centers to establish truck routes and to add on-site signage to direct trucks exiting the facility to those routes. Potential Partners: City/county public works and planning departments, distribution centers.	Short	$

TRUCKS

Strategies	*Timeframe*	*Relative Cost*
Conduct traffic studies on local highways to forecast traffic growth and facility improvement needs. Potential Partners: Caltrans, RCTC, CVAG	Short	$$-$$$
Coordinate impacts of new roadway connections with adjacent cities and counties to ensure consistent design and operations. Potential Partners: City/county public works departments, facility operators.	Short	$
Assess truck volumes and travel patterns on roadways to identify priority improvement areas. Potential Partners: City/county public works departments, Caltrans.	Short	$$
Coordinate signal systems with adjacent jurisdictions, and with county transportation agencies and Caltrans. Potential Partners: City/county public works departments, Caltrans.	Mid	$$$
Assess the need for industry or truck impact fees in local communities to support financing of infrastructure improvements. Potential Partners: City/county public works departments, CVAG.	Short	$
Enact zoning codes to ensure that new freight facilities have adequate truck parking. Potential Partners: City/county planning and public works departments.	Short	$
Cities and county can pass ordinances to prohibit vehicle parking on certain roadways. Potential Partners: City/county planning and public works departments.	Short	$
In addition to enforcement, communicate new or existing route information to truckers through trucking companies or places where truckers are, such as rest areas or fueling stations. Potential Partners: City/county public works departments, trucking companies and associations.	Short	$
Identify truck corridors that would most benefit from designated truck routes. Potential Partners: Caltrans, city/county public works and planning departments, CVAG, major trucking companies/local warehouses.	Short	$
Implement truck routes on selected corridors. Potential Partners: Caltrans, city/county public works department, CVAG.	Short	$$

RAIL LINES AND CROSSINGS

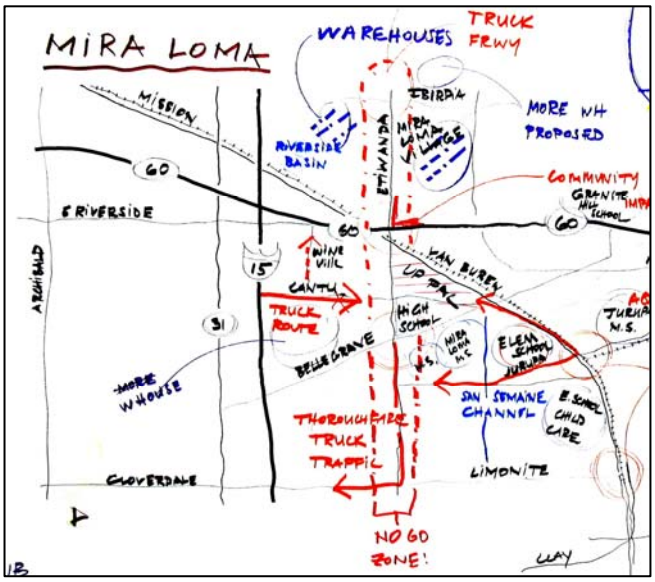
Strategies	*Timeframe*	*Relative Cost*
Build grade-separations at Avenues 56 and 66. Potential Partners: County public works, rail operators	Mid	$$$$
Identify crossings best suited for traffic redirection. Potential Partners: City/county public works departments, CVAG, local community members.	Short	$
Develop alternative vehicle routes & determine if street upgrades are necessary. Potential Partners: City/county public works departments, local community members.	Short	$
Implement redirection strategies.	Short	$$

Strategies	*Timeframe*	*Relative Cost*
Potential Partners: City/county public works departments.		
Identify at-risk traffic intersections. Potential Partners: City/county public works department, community members, railroads Caltrans.	Short	$
Pursue additional funding for grade separations throughout the corridor Potential Partners: CVAG, RCTC, Caltrans, State, cities	Short	$
Coordinate with state and local agencies and rail operators to select and implement crossing signal systems and/or grade separations. Potential Partners: RCTC, FRA, city/county public works department, railroads Caltrans.	Short-Mid	$$$-$$$$
Coordinate with local agencies to implement interim safety improvements (e.g., raised medians, pre-signed quad gates) in advance of implementing grade separation projects. Potential Partners: RCTC, CVAG, city/county public works departments, Caltrans.	Short	$$$
Work with state, federal and local agencies as well as rail operators to minimize safety hazards and congestion at rail crossings. Potential Partners: RCTC, CVAG, FRA, city/county public works department, railroads Caltrans.	Short	$$

MIRA LOMA
Riverside County

Description

Located in the western portion of Riverside County, the Mira Loma community is an unincorporated area where the remnants of a farming and dairy society are still visible among a mix of modern goods movement facilities and some old and new residential areas. At the center of the community is the Mira Loma Railyard operated by Union Pacific, surrounded by supporting warehouses and distribution centers, as well as State Route 60 and Interstate 15.



Portion of the wallgraphic from Mira Loma Community Feedback Group Meeting #1

The Mira Loma community has experienced significant impacts from these goods movement facilities. Community members and activists have spearheaded and documented efforts to quantify community health impacts from situating sensitive land uses—particularly schools and residential areas—near goods movement facilities. Specifically, they have identified significant health disparities related to air quality from the railyard and supporting truck operations including premature deaths, reduced lung development and capacity, and cancer rates. Additionally, community members and activists have worked to gain more influence over land use decision-making in their community, which they believe is central to creating a safer and healthier community for residents.

Impacts

Overall, the Mira Loma CFG identified impacts that primarily reflect ongoing perceptions, experiences and issues, but also identified some anticipated experiences in the future. Specifically, over the course of three meetings, the CFG identified:

- Land use:
  - Lack of local control of land use decision-making because of the area's status as an unincorporated area of the County
- Air quality:
  - Highest levels of PM 10 and PM 2.5 in the nation due to trucks and rail
- Trucks in residential areas:
  - Traveling, idling and parking on residential streets and near school areas
    - Appropriate truck rest areas are not available
  - Contribute to local congestion
  - Incomplete and under-signed designated truck routes
  - Lack of enforcement of current laws
- Warehousing and distribution centers:
  - Pressure to expand or locate adjacent to residential areas
  - Avoiding the placement of low-income housing as "buffers" between incompatible uses and goods movement facilities
  - Facilitate truck traffic
- Rail crossings:
  - Trains proceed slowly or park at crossings for extended periods
- Local economy:

- Local jobs in goods movement industries are low wage, temporary and unstable without adequate compensation, or are higher, managerial level positions filled by others who do not live in Mira Loma
- Overall, some CFG members believe that the community health impacts far outweigh any local economic benefits

Potential Local Strategies and Partners

Following are local strategies and potential partners organized by goods movement mode as identified by the CFG and recommended for consideration by the Study team. Also noted are estimates for the number of years and relative cost that may be necessary for implementation of each strategy. A general guide to the range of costs is as follows:

$: less than $10,000
$$: $10,001 – $100,000
$$$: $100,001 – $1 million
$$$$: greater than $1 million

A general guide to the relative timeframe to implement strategies is as follows:

Short: 0–5 years
Mid: 5–10 years
Long: 10+ years

TRUCKS

Strategies	*Timeframe*	*Relative Cost*
Complete previous truck route study that identified Cantu-Galleano as a preferred route Potential Partners: County transportation, Caltrans, truck operators, local residents	Short	$-$$
Implement truck routes on selected corridors. Potential Partners: Caltrans, city/county public works department, Councils of Government, major trucking companies and distributors.	Short	$$
Assess truck volumes and travel patterns on roadways to identify priority improvement areas. Potential Partners: County public works departments, Caltrans.	Short	$$
Enact planning codes to ensure that new freight facilities have adequate truck parking. Potential Partners: County planning and public works departments.	Short	$
Consider ordinance to prohibit vehicle parking on certain roadways. Potential Partners: County planning and public works departments.	Short	$
In addition to enforcement, communicate new or existing route information to truckers through trucking companies or places where truckers are, such as rest areas or fueling stations. Potential Partners: County public works departments, trucking companies and associations.	Short	$
Repave roadways with "quiet pavement" materials that reduce road noise. Potential Partners: County public works department, Caltrans.	0-10	$$
Assess the need for industry or truck impact fees in local communities to support	Short	$

Strategies	*Timeframe*	*Relative Cost*
financing of infrastructure improvements. Potential Partners: County public works department		

RAIL LINES AND CROSSINGS

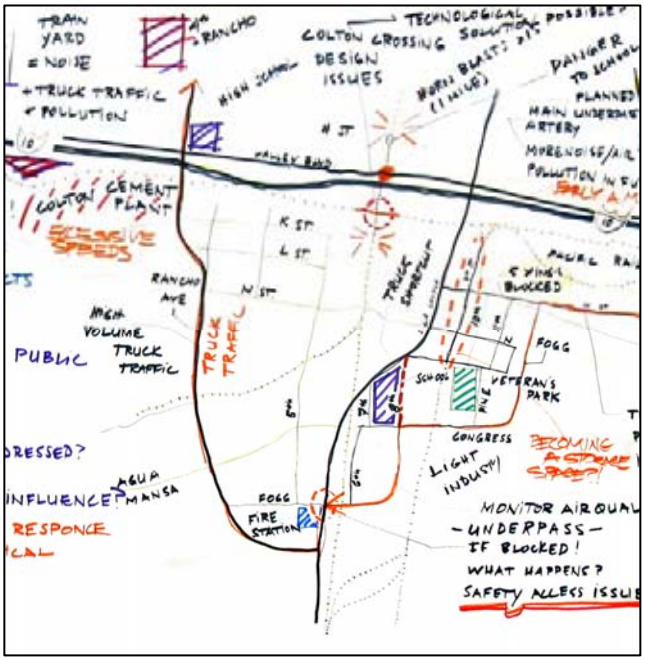
Strategies	*Timeframe*	*Relative Cost*
Identify at-risk traffic intersections, particularly along the "Cement Plant Spur." Potential Partners: County public works department, community members, UP, Caltrans.	Short	$
Work with state and federal agencies as well as UP to minimize safety hazards and congestion at rail crossings. Potential Partners: RCTC, FRA, county public works department, UP, Caltrans.	Short	$$
For existing and new projects, facilitate communication between operators and local communities to build mutual awareness of operational needs, impact concerns, and potential solutions. Potential Partners: County, facility operators, community members	Short	$

RAILYARD AND WAREHOUSING (NOISE)

Strategies	*Timeframe*	*Relative Cost*
Employ a range of sound barriers (walls, landscaping, etc.) along property line of affected sensitive land uses. Potential Partners: Railyard, county, warehouses.	5-10	$$-$$$
Work with railyard to focus operations away from properties not separated by sound barriers. Potential Partners: Railyard, county.	Short	$
Research ways to secure funding (for example, grants and new legislation) for programs which would help homeowners sound-proof windows and doors. Potential Partners: County, community members.	Short	$
Explore opportunities with railyard for reduced horn use, frequency and or volume Potential Partners: Railyard, county, community members.	Short	$
Facilitate communication between railyard and local communities to build mutual awareness of operational needs, impact concerns, and potential solutions. Potential Partners: Railyard, county, community members	Short-Mid	$

CITY OF COLTON
San Bernardino County

Description
The southern portion of the City of Colton is an old residential neighborhood with families who have lived in the area for many generations. Having started as a railroad town, it continues as such to this date with significant railroad traffic traveling along two main lines that cross each other, one operated by BNSF and the other by UP. A locally-serving spur line serves locations south of the neighborhood, with the line traveling directly down the middle of a local street.



Portion of the wallgraphic from South Colton Community Feedback Group Meeting #1

Impacts
Over the course of four meetings, the CFG identified the following perceptions about impacts and concerns that may become more significant over time due to growth of goods movement:

- Noise
  - Frequently impacts the community during day and night operations, primarily in the northern part of the community
  - The added third rail line has increased the frequency of train noise
  - Over 10 train horn blasts occur within a one mile stretch
- Safety
  - Train traffic on 9th Street poses public safety risks to residents
    - No safety barriers
    - Occasionally blocks up to five street crossings by parking for extended periods, including M Street, a critical thoroughfare
  - The Fogg Street underpass is narrow and short, potentially resulting in blocked passage for first responders
  - Unsafe railroad crossings at Valley Blvd., H Street, and 9th Street pose dangers to school children
  - Trucks take illegal short-cuts on residential streets
  - Trains travel local rail lines at excessive speeds
- Air Quality
  - High volume of truck traffic on Rancho Avenue may produce dangerous emission levels
  - A new Colton Crossing may facilitate higher emission levels

Potential Local Strategies and Partners

Following are local strategies and potential partners organized by goods movement mode as identified by the CFG and recommended for consideration by the Study team. Also noted are estimates for the number of years and relative cost that may be necessary for implementation of each strategy. A general guide to the range of costs is as follows:

$: less than $10,000
$$: $10,001 – $100,000
$$$: $100,001 – $1 million
$$$$: greater than $1 million

A general guide to the relative timeframe to implement strategies is as follows:

Short: 0–5 years
Mid: 5–10 years
Long: 10+ years

RAIL LINES (NOISE)

Strategies	*Timeframe*	*Relative Cost*
Research ways to secure funding (for example, grants and new legislation) for programs which would help homeowners sound-proof windows and doors. Potential Partners: SANBAG, city, county	Short	$
Explore opportunities with railroads for reduced horn use, frequency and or volume (similar to passenger rail levels) at specific locations—particularly in residential areas and on 9th Street—that still meet FRA requirements. Potential Partners: Railroads, FRA, City	Short	$
Explore opportunities with railroads to adjust positioning of horns on locomotives to reduce horn impacts on residential areas that still meet FRA requirements. Potential Partners: Railroads, FRA, City	Short	$
Study the possibility of designating a section of 9th Street and other areas as a "quiet zone." Potential Partners: FRA, City, UP	Short	$
Search for funding from legislation and grants for new rail crossing systems, compatible with quiet zone regulations. Potential Partners: SANBAG, City.	Short	$
Study options for sound barriers—including native landscaping, berms, and walls—along property lines of affected sensitive land uses where possible, ensuring adequate safety access for rail operators. Target the 600 block of East M Street, and link to the development of the Colton Crossing project. Potential Partners: Railroads, City.	Mid	$$-$$$

RAIL CROSSINGS

Strategies	*Timeframe*	*Relative Cost*
Study possibility of removing the 9th Street rail line and relocating rail operations onto the BNSF line. Potential Partners: Railroads, FRA	Short	$
Identify at-risk traffic intersections for pedestrians and vehicles. Potential Partners: City public works department, community members, railroads, Caltrans.	Short	$
Study options to eliminate at-grade crossings in the community. Potential Partners: City planning and public works departments, community members	Short	$
Study options to improve congestion levels at the Valley Blvd crossing. Potential Partners: City planning and public works departments, BNSF.	Short	$
Work with state and federal agencies as well as rail operators to minimize safety hazards and congestion at rail crossings. Potential Partners: SANBAG, FRA, city public works department, railroads Caltrans.	Short	$$
Study feasibility and cost of installing four-quadrant gates at rail crossings, particularly on 9th Street. Potential Partners: UP, FRA, City	Short	$
Install four-quadrant gates at rail crossings. Potential Partners: Railroads, FRA, City	Mid	$$$
Improve the Fogg Street undercrossing to improve public safety access. Potential Partners: BNSF, City	Mid	$$$
Coordinate with state agencies and rail operators to select and implement additional crossing signal systems in the community including wayside horns and signage. Potential Partners: SANBAG, FRA, city public works department, railroads Caltrans.	Short-Long	$$$

TRUCKS

Strategies	*Timeframe*	*Relative Cost*
Study opportunities to change delivery hours of local trucking operators to minimize or eliminate travel during peak hours, particularly related to schools. Potential Partners: City, truck operators, local residents	Short	$
Enforce current truck routes. Potential Partners: City police, truck operators	Short	$

PUBLIC AWARENESS AND ACTION

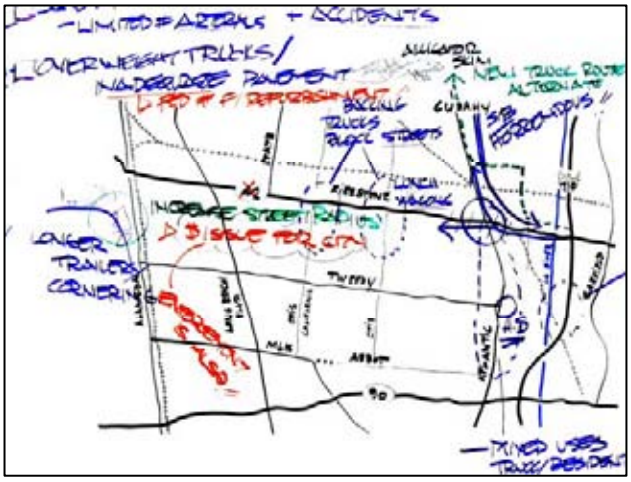
Strategies	*Timeframe*	*Relative Cost*
Share info with the community about goods movement impacts and potential solutions to build support for taking action and promote safety. Potential Partners: City, local residents.	Short	$
Document goods movement impacts with photos and maps to illustrate impacts. Potential Partners: City, local residents.	Short	$
Build awareness of goods movement impacts on the community among local goods	Short	$

Strategies	*Timeframe*	*Relative Cost*
movement operators. Potential Partners: City, local residents, railroads, truck operators.		
Partner with local schools to distribute information to youth and parents about safety and potential solutions to goods movement impacts. Potential Partners: City, school district.	Short	$
Translate this document and other education materials into Spanish language with terms that are easy to understand. Potential Partners: SANBAG, City.	Short	$

CITY OF SOUTH GATE
Los Angeles County

Description

The City of South Gate is one of many communities situated near the Ports of Los Angeles and Long Beach and their supporting infrastructure, particularly the I-710 freeway and warehousing and distribution centers. There are many businesses linked to port activities that negatively impact the community. The City experiences high volumes of truck traffic on major arterials like Firestone Boulevard, Garfield Avenue, and Atlantic Avenue, which have sensitive land uses along the corridor such as schools.



Portion of the wallgraphic from South Gate Community Feedback Group Meeting #2

Impacts

Over the course of four meetings, the CFG identified the following perceptions about impacts and concerns that may become more significant over time due to growth of goods movement:

- Truck traffic on major arterials
  - Longer trailers are unable to negotiate a turn properly and some of the intersections are not designed to accommodate these turning movements
  - There is significant congestion between 4 and 6 p.m.
  - Southbound traffic congestion on Atlantic Avenue at the Firestone Boulevard intersection is heavy
- Warehouses and distribution centers
  - Trucks backing out from warehouses create safety issues
  - Trucks double park to unload at facilities, creating safety issues
- Air quality impacts
  - There are 28 schools in South Gate plus a community college
  - Truck- and freight-generated pollution is a major concern relating to the health of school children and residents alike
- Noise
  - Trucks arrive at 4 a.m. and run refrigerator compressors while parked adjacent to neighborhoods
- Other
  - Pavement structure is inadequate in some areas to deal with overweight trucks; streets have "alligator cracks" and "ruts"
  - More enforcement of existing city ordinances is needed, specifically for truck parking and illegal dumping in commercial and residential neighborhoods
  - Many warehouse/distribution facilities receive shipments from out-of-state, long-distance sources.

Potential Local Strategies and Partners

Following are local strategies and potential partners organized by goods movement mode as identified by the CFG and recommended for consideration by the Study team. Also noted are estimates for the number of years and relative cost that may be necessary for implementation of each strategy. A general guide to the range of costs is as follows

$: less than $10,000
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A general guide to the relative timeframe to implement strategies is as follows:

Short: 0–5 years
Mid: 5–10 years
Long: 10+ years

TRUCKS (PARKING AND ROUTING)

Strategies	*Timeframe*	*Relative Cost*
Implement new "staging area" to keep trucks out of residential areas. Potential Partners: City, truck operators.	Short	$$$
Explore opportunities to allow extended parking at new inspection facilities along I-710 or near the ports. Potential Partners: GCCOG, Ports	Short	$
Implement new alternative truck route that bypasses the Firestone/Atlantic intersection, which is currently under consideration as part of the City's General Plan update. Potential Partners: City, truck operators	Long	$$$$
Post street signage directing truckers to designated truck parking sites and routes. Potential Partners: City, trucking associations	Short	$$
In addition to enforcement, communicate new or existing route information to truckers through truck drivers or places where drivers are, such as rest areas or fueling stations. Potential Partners: City, trucking companies and associations.	Short	$
Enact planning codes to ensure that new freight facilities have adequate truck parking. Potential Partners: City.	Short	$
Consider an ordinance to prohibit vehicle parking on certain roadways. Potential Partners: City.	Short	$
Consider feasibility of developing a "freight overlay zone" as part of the City's General Plan policy framework, potentially in coordination with neighboring cities. Potential Partners: City, adjacent cities, GCCOG.	Mid	$

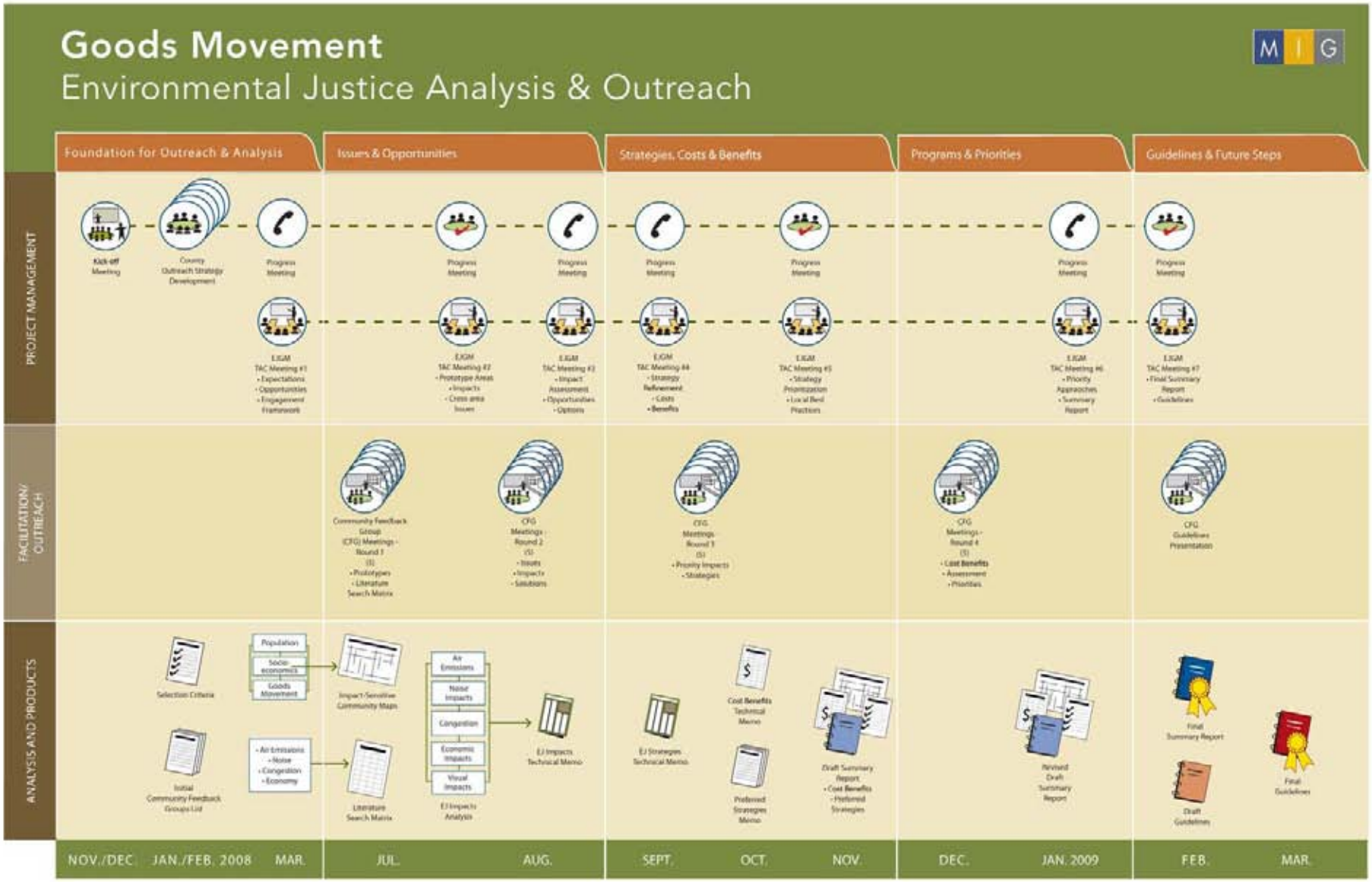
TRUCKS (TRAFFIC, SAFETY AND NOISE)

Strategies	*Timeframe*	*Relative Cost*
Coordinate roadway improvements with adjacent cities to ensure consistent design. Potential Partners: City.	Short	$
Identify funding opportunities to design and install traffic calming measures. Potential Partners: City.	Short	$
Coordinate signal systems with adjacent jurisdictions, and with county transportation agencies and Caltrans. Potential Partners: City, County, Caltrans, GCCOG, adjacent cities.	Short	$$
Designate "truck free zones" on streets or in neighborhoods. Potential Partners: City, trucking companies, local residents.	Short	$
Assess the need for industry or truck impact fees in the City to support financing of infrastructure improvements. Potential Partners: City.	Long	$$
Continue repaving roadways with "rubberized asphalt" materials that reduce roadway noise. Potential Partners: City.	Ongoing	$$$$
Coordinate construction of soundwalls at key locations. Potential Partners: City, Caltrans, GCCOG.	Ongoing	$

WAREHOUSING AND DISTRIBUTION CENTERS

Strategies	*Timeframe*	*Relative Cost*
Study opportunities for freight facilities to implement scheduling system to support preferred truck traffic hours on local arterials. Potential Partners: Shipping companies, City, trucking companies.	Mid	$
Study opportunities for freight facilities to extend hours-of-operation into off-peak periods in support of preferred truck traffic hours on local arterials. Potential Partners: Shipping companies, City, trucking companies.	Mid	$
For new projects, prohibit facility design that forces or encourages trucks to back into the facility from public streets Potential Partners: City	Mid	$
Consider additional soundproofing requirements to applicable City codes in areas affected by excess noise. Potential Partners: City.	Mid	$
Research ways to secure funding (for example, grants and new legislation) for programs which would help homeowners sound-proof windows and doors. Potential Partners: City.	Mid	$
Study potential caps to warehouse and distribution center volumes to mitigate truck traffic impacts. Potential Partners: City.	Mid	$$
For existing and new projects, facilitate communication between operators and local communities to build mutual awareness of operational needs, impact concerns, and potential solutions. Potential Partners: City, facility operators.	Ongoing	$$

PROCESS GRAPHIC



glossary and acronyms

GLOSSARY

California Environmental Quality Act (CEQA): California Environmental Quality Act, enacted in 1970, requires government agencies in California to identify the significant environmental impacts of their actions, and avoid or mitigate those impacts if possible. CEQA applies to all projects undertaken by public agencies, as well as to private projects that are subject to the review or approval of a public agency.

Cargo Handling Equipment: Cargo-handling equipment refers to equipment used at ports, railyards, and other freight facilities to moves containers and bulk shipments. Examples include yard tractors, cranes, forklifts, top picks, and side picks.

Diesel Particulate Matter (DPM): Diesel particulate matter is the particulate component of diesel exhaust from diesel fuel, which includes diesel soot and aerosols such as ash particulates, metallic abrasion particles, sulfates, and silicates.

Drayage Trucks: Drayage trucks are those that travel short distances to move goods to and from ports and rail yards.

EMFAC: The EMission FACtors (EMFAC) model is used to calculate emission rates from all motor vehicles, such as passenger cars to heavy-duty trucks, operating on highways, freeways and local roads in California. Developed by the California Air Resources Board, EMFAC2007 is the most recent version of this model.

Gen-set Locomotive: A generator set ("Gen Set") locomotives uses a series of smaller diesel engines (each approximately 700 horsepower) to directly power the traction motors. One or two of the engines can be shut down in operations with lower power demand, saving fuel and reducing emissions.

Grade Crossing: A grade crossing is the intersection of a roadway and a railroad line "at grade," so vehicles must wait when a train is passing through the crossing.

Harbor Craft: Commercial harbor craft help move large ships and provide supplies to the port. They include tugboats, ferries, small excursion craft, supply vessels, dredges, and service boats.

Health Risk Assessment: Heath Risk Assessments are used to estimate whether current or future chemical exposures will pose health risks to a broad population, such as a city or a community. The U.S. Environmental Protection Agency (U.S. EPA) is a leading risk assessment agency at the federal level. In California, the Office of Environmental Health Hazard Assessment (OEHHA) in the California Environmental Protection Agency (Cal/EPA) has the primary responsibility for developing procedures and practices for performing health risk assessments.

Hybrid Locomotive: A hybrid-electric locomotive uses a small, low-emission diesel engine to charge a battery pack that powers the traction motors. These engines can also recover braking energy to improve fuel efficiency. Used in rail yards, these locomotives use less fuel and reduce emissions compared to conventional switcher locomotives.

Intermodal: Intermodal transportation involves the use of more than one mode of transport for a journey. Intermodal freight typically refers to shipments that travel by both truck and railroad.

Level of Service (LOS): Level of Service (LOS) is a letter grading system ranging from ranging from A (best) to F (worst) that measures the congestion levels on roadways or at intersections. Grades are assigned based on the average delay per vehicle.

National Environmental Policy Act (NEPA): The National Environmental Policy Act of 1969 requires agencies to evaluate the environmental impacts of any "major federal action significantly affecting the quality of the human environment." NEPA applies to any action that involves the use of federal funds, the need for federal approval in the form of permits, or a location on federal land.

Ocean Going Vessels (OGV): Ocean going vessels or ships include container ships, tanker ships, bulk carriers, automobile carriers, general cargo ships, roll-on roll-off ships, and cruise ships.

Oxides of Nitrogen (NOx): Oxides of Nitrogen are compounds of oxygen and nitrogen such as Nitric Oxide (NO), nitrogen dioxide (NO2) and Nitrous Oxide (N2O). Along with reactive organic gas (ROG), NOx is the main ingredient in ground level ozone, commonly called smog.

Particulate Matter (PM): Particulate matter is the term for solid or liquid particles found in the air. Some particles are large or dark enough to be seen as soot or smoke. Because particles originate from a variety of mobile and stationary sources (diesel fuel, woodstoves, power plants, etc.), their chemical and physical compositions vary widely. Particulate matter can be directly emitted or can be formed in the atmosphere when gaseous pollutants such as SO2 and NOx react to form fine particles. PM10 refers to particles less than or equal to 10 microns and PM 2.5: refers to particles less than or equal to 2.5 microns), also called fine particulate matter or "Fine particles" such as those found in smoke and haze.

Reactive Organic Gas (ROG): Reactive Organic Gas are organic chemical compounds that react in the atmosphere (nitrogen oxides) to form ground level ozone, commonly called smog. They are released by a variety of sources including burning of petroleum fuels, use of solvents, petroleum processing and storage, and pesticides. The U.S. EPA refers to these gases ad volatile organic compounds (VOCs).

Sound Exposure Level (SEL): SEL is the basic noise unit, also known as the "single-event level." The SEL describes the amount of noise exposure from a single event, such as a freight train passing by one residence.

Switching locomotive: Switching locomotives are just used in the rail yards to move rail cars to tracks for loading or unloading intermodal containers or move rail cars onto a track to assemble an outbound train.

Transportation Refrigeration Units (TRUs): Transportation refrigeration units (TRUs), or "reefers", are gasoline and diesel powered cooling units that are installed on vehicles used in transporting produce, meat, dairy products, and other perishable goods. TRUs are found on refrigerated vans, trucks, trailers, and railcars.

URBEMIS: The URBan EMISsions (URBEMIS) is a software program which is used to estimate emissions from construction and operation of land use development. The URBEMIS 2007 model uses the California Air Resources Board's EMFAC2007 model for on-road vehicle emissions and the OFFROAD2007 model for off-road vehicle emissions.

ACRONYMS

AESS	Automatic Engine Start-Stop Device
APU	Auxiliary Power Unit
AQMP	Air Quality Management Plan
ARB	Air Resources Board
B100	Biofuel blend, 100% biodiesel
B20	Biofuel blend, 20% biodiesel
BNSF	Burlington Northern Santa Fe Railway
CA EDD	California Employment Development Department
CEQA	California Environmental Quality Act
CFG	Community Feedback Group
CHE	Cargo Handling Equipment
CHP	California Highway Patrol
CNEL	Community Noise Equivalent Level
CNG	Compressed Natural Gas
CO	Carbon Monoxide
COG	Council of Government
dB	Decibel
dBA	Decibel Adjusted
DOC	Diesel Oxidation Catalyst
DPF	Diesel Particulate Filter
DPM	Diesel Particulate Matter
EMFAC	ARB EMission FACtor model
EPA	Environmental Protection Agency

FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
FTF	Flow-through Filter
GCCOG	Gateway Cities Council of Governments
GVWR	Gross Vehicle Weight Rating
HC	Hydrocarbon
HP	Horsepower
HRA	Health Risk Assessment
HVAC	Heating, Ventilation and Air Conditioning System
ICTF	Intermodal Container Transfer Facility
LAUSD	Los Angeles Unified School District
LAWA	Los Angeles World Airports
LAX	Los Angeles International Airport
Leq	Equivalent Sound Level
LNG	Liquefied Natural Gas
LOS	Level Of Service
MSW	Municipal Solid Waste
NAFTA	North America Free Trade Agreement
NEPA	National Environmental Policy Act
NHTSA	National Highway Traffic Safety Administration
NOx	Oxides of Nitrogen
OGV	Ocean-Going Vessel

OPR	California Office of Planning and Research
PHIMF	Puente Hills Intermodal Facility
PM	Particulate Matter
PM-10	Particulate Matter less than 10 microns in diameter
PM-2.5	Fine Particulate Matter (less than 2.5 micron2 in diameter)
PMI	Point of Maximum Impact
POLA	Port of Los Angeles
POLB	Port of Long Beach
ROG	Reactive Organic Gas
SANBAG	San Bernardino Associated Governments
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SEL	Sound Exposure Level
SPB	San Pedro Bay
STC	Sound Transmission Class
TEA	Transportation Enhancement Activities Grant
TRU	Transport Refrigeration Unit
UP	Union Pacific Railroad
URBEMIS	URBan EMISsion Model
USDOT	United States Department of Transportation
VMT	Vehicle-Miles Traveled
VSR	Vessel Speed Reduction

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