

High-Cube Warehouse Truck Study

Technical Working Group

March 8, 2012

Purpose of High-Cube Warehouse Truck Trip Study

- Warehouses and distribution centers attract a number of heavy duty diesel trucks on a daily basis
- AQMD is a commenting agency on air quality issues under CEQA
- Warehouse projects may not have a tenant at time of CEQA approval, therefore CEQA requires a reasonable worst case analysis
- AQMD staff has developed a recommendation for trip rates based on existing data, however more data is needed to enhance current assumptions to assess air quality impacts

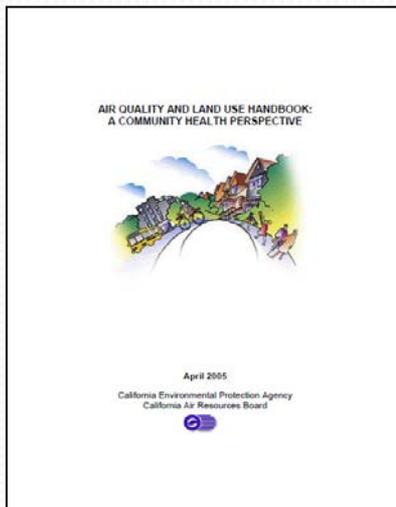


Role of the Technical Working Group

- Review relevant materials related to trip rates used for warehouse development
- Provide technical feedback on proposed study methodology
- Review progress of study, and provide feedback regarding study results
- Review and comment on the use of study results
- Total study period approximately 6 months

Relationship Between Truck Trips and Air Quality

- Most heavy duty trucks are diesel
- Exposure to Diesel Particulate Matter (DPM) can cause adverse health effects
 - DPM designated as a carcinogen by state
 - DPM also causes non-carcinogenic health impacts



- ***Local Impacts***
 - Some warehouse / distribution centers are located in or near residential neighborhoods
- ***Regional Impacts***
 - Trucks travel long distances in the basin and emit NO_x and PM

Background

- First AQMD warehouse study in 2002 investigated proliferation of warehouses in Mira Loma and Fontana
- Air quality and health impacts from warehouse/distribution centers due to diesel trucks
- Warehouse projects continue to increase in numbers and size
- Projections indicate more warehouses
 - SCAG projects additional 412 million square feet of warehousing in Riverside and San Bernardino in next 25 years
 - Ports of Los Angeles and Long Beach forecast tripling of containers in next 25 years
 - New projects being developed now, including Moreno Valley NOP for 40 million square feet of warehousing

Exhibit A
Project Description Summary

for

World Logistics Center
Specific Plan

Prepared for

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Moreno Valley, CA 92553

Prepared by

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February 21, 2012

Air Quality Analysis – CEQA

- AQMD staff recommends new warehouse projects evaluate potential air quality impacts for:
 - Criteria Pollutants
 - Regional impacts (entire truck trip length)
 - Localized impacts (truck travel onsite and to closest freeway)
 - Health Risks
 - Diesel exhaust
- AQMD has adopted maximum *daily* regional and local thresholds recommended for use by other lead agencies
 - Staff recommends an analysis that captures potential unless enforceable conditions limit project activities to what was analyzed in EIR

Terminology

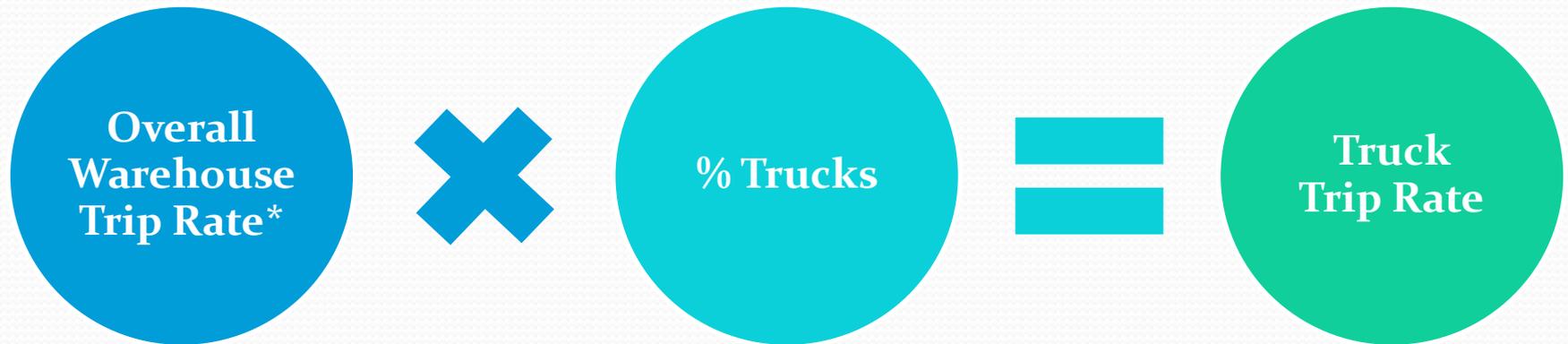
- High-Cube Warehouse
 - Used for the storage of manufactured goods prior to their distribution locally or regionally.
 - Commonly larger than 100,000 square feet
 - Typically 24-30 feet tall
 - Contain many dock doors for loading/unloading trucks
 - Can facilitate many different types of operations

High Cube Warehouse



Terminology

- Overall Warehouse Trip Rate vs. Truck Trip Rate



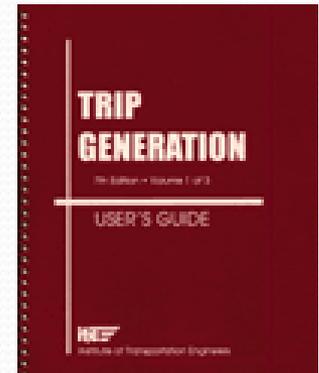
- Example:

- $1.44 \text{ trips}/1,000 \text{ ft.}^2 \times 20\% \text{ trucks} = 0.29 \text{ truck trips}/1,000 \text{ ft.}^2$

*Overall warehouse trip rate includes truck and passenger car trip rate

Trip Rate Background

- Institute of Transportation Engineers (ITE) Trip Generation Manual is the most commonly cited reference to determine trip rates for most land uses
- ITE 7th Edition (2003) did not have a daily overall trip rate for high-cube warehouses due to lack of data
 - **4.96** trips per 1,000 ft.² of building space for *all warehouses*
 - Includes all truck trips and employee trips
 - No data on truck% vs. car%



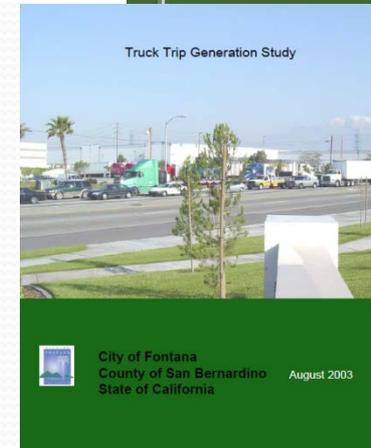
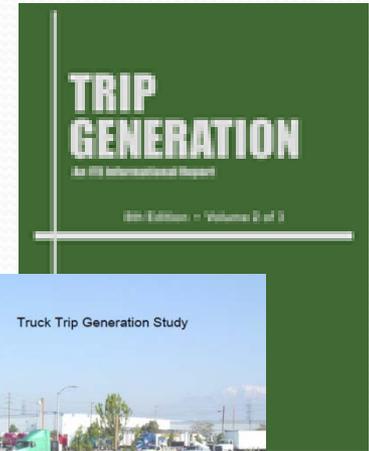
Trip Rate Background

- ITE Manual provides overall trip rate data for high-cube warehouses
 - Uses an average rate
 - Does not represent “reasonable worst case” recommended for air quality analysis

Year	Study	Average Trip Rate (trips/TSF)	Used in ITE 8 th Edition?
2003	ITE 7th Edition (All Warehouses)	4.96	Yes
2003	Fontana	4.81	No
2005	NAIOP San Bernardino/Riverside	1.1	Yes
2006	Manalapan, New Jersey	Data unavailable	Yes
2007	Tampa, Florida	Data unavailable	Yes
2007	Fresno	0.66	Yes
2008	NAIOP Inland Empire	1.11	Yes
2008	Jacksonville, Florida #1	1.83	Yes
2008	Jacksonville, Florida #2	2.57	Yes
2008	Visalia	1.26	No
2008	ITE 8th Edition (High-Cube Warehouses)	1.44	

Trip Rate Background

- ITE 8th Edition (2008) presented new overall trip rate for high-cube warehouses
 - **1.44** trips per 1,000 ft.²
 - Daily truck trip rate = 0.64 (44%)
- Truck Trip percentage most commonly obtained from Fontana Truck Trip Study
 - High-Cube Warehouse Truck percentage = 20.4%



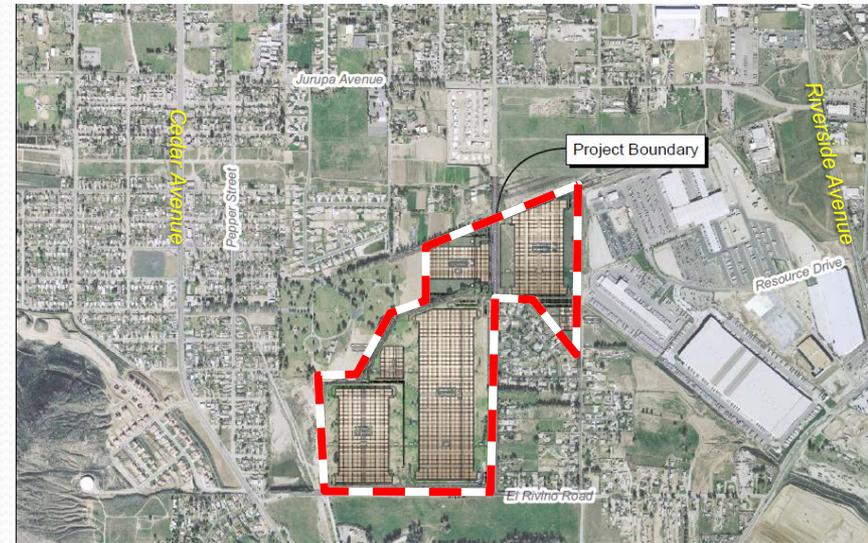
Variability in Trip Rates

- Guidance varies for each jurisdiction

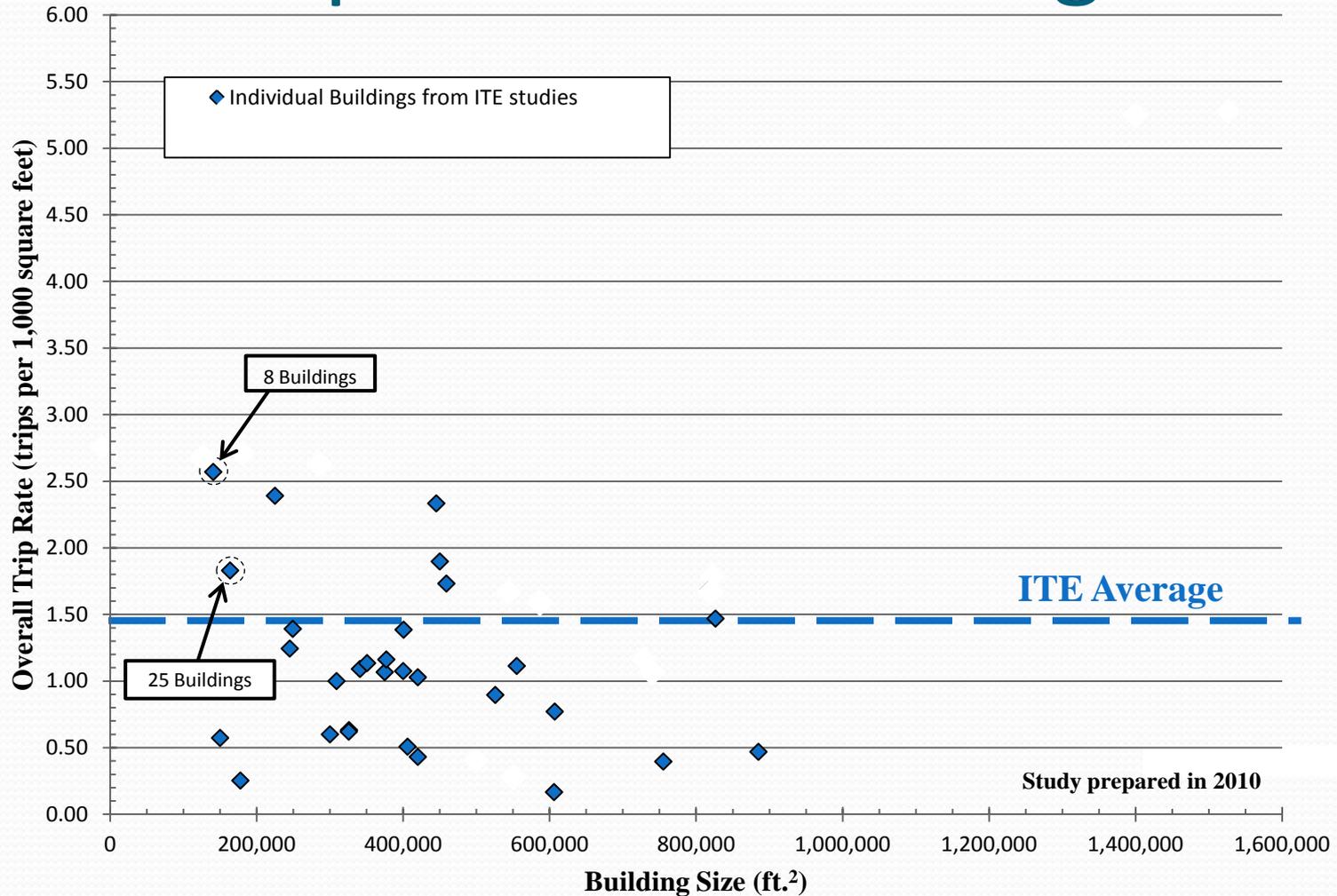
Recent Projects with CEQA Approval	Building Size (ft. ²)	Overall Trip Rate	Truck %	Truck Trip Rate
Banning Business Gateway	787,000	1.44	20%	0.29
South Perris Industrial	7,400,000	1.61	20%	0.33
Rialto Commerce Center	3,475,000	1.44	29%	0.41
Rados Distribution Center	1,191,000	1.1	53%	0.59
Palm Industrial	678,275	1.91	47%	0.90
West Ridge Commerce Center	937,260	1.69	54%	0.91
Mira Loma Commerce Center	782,398	4.96	20%	1.01

Rialto Commerce Center

- 3.6 million ft² warehouse project in southern Rialto adjacent to homes
- Project approved in 2011
- Project used ITE overall trip rate of 1.44
 - Truck trip rate of 0.41
- City and County of Riverside brought CEQA lawsuit over concerns about underestimation of truck traffic
- Lawsuit recently settled with Rialto agreeing to pay City and County of Riverside *\$3.5 million*

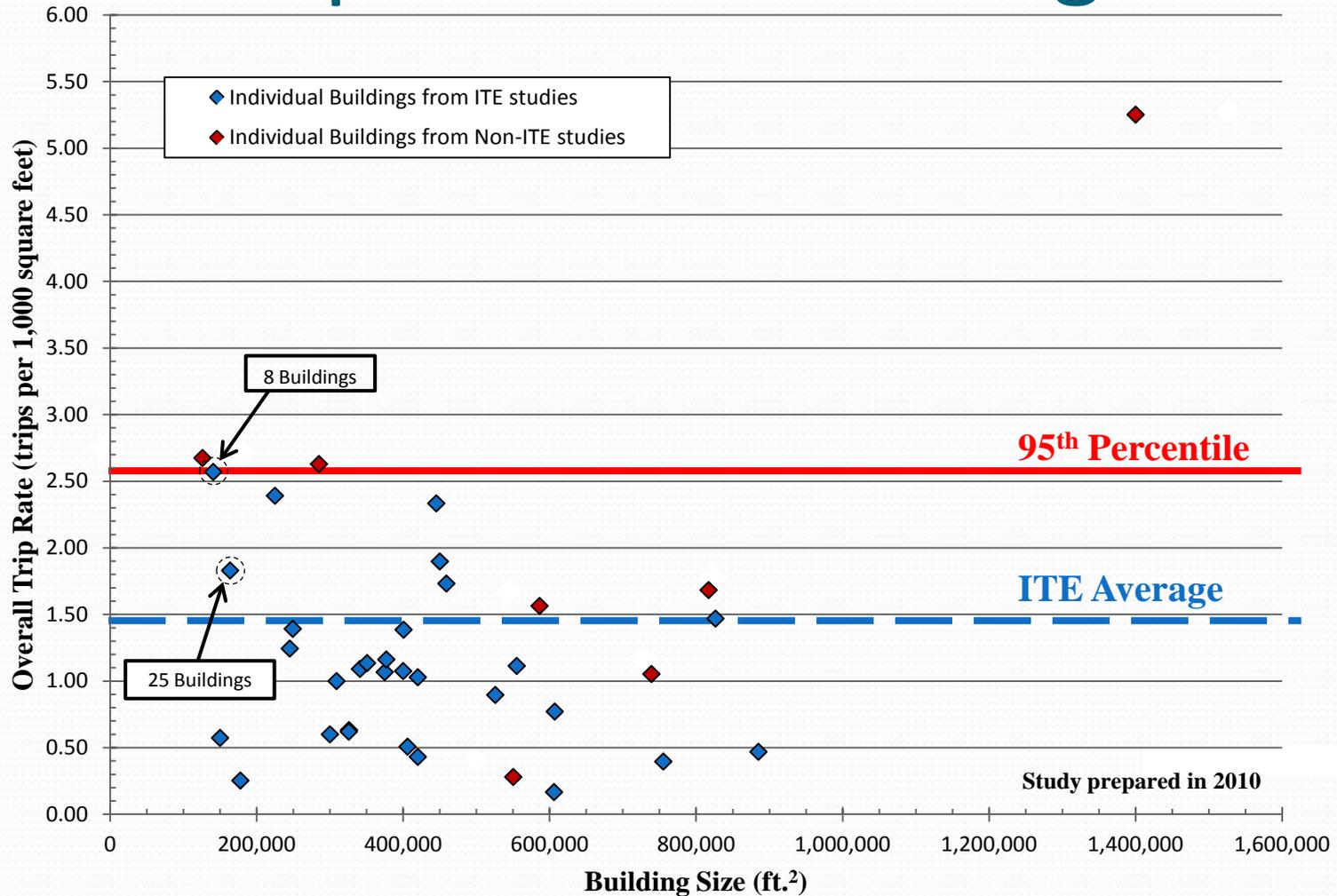


Overall Trip Rate vs. Building Size



- Lack of correlation between building size, and trips or trip rate

Overall Trip Rate vs. Building Size



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Current AQMD Staff Trip Rate Recommendation

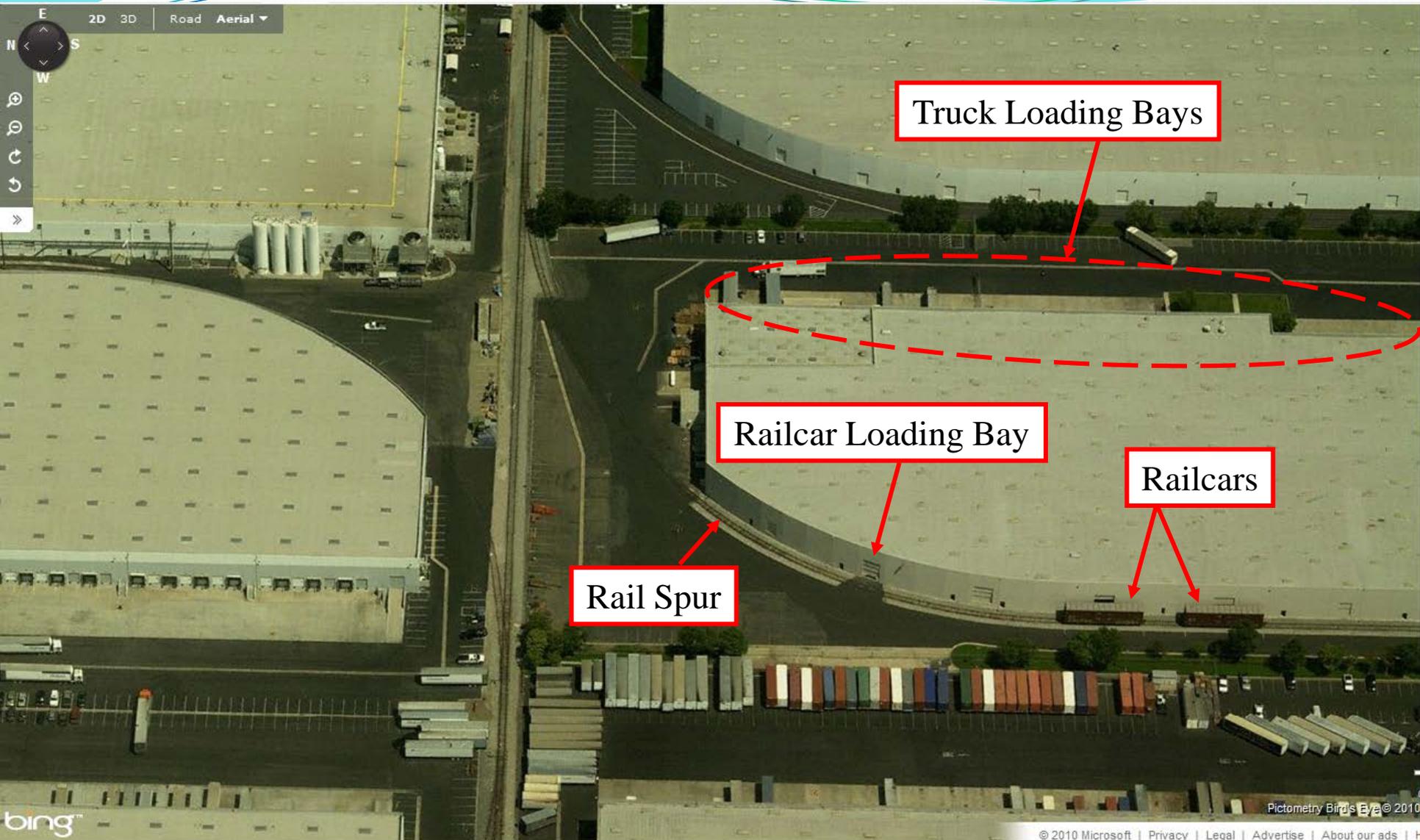
- AQMD Staff current recommendation:



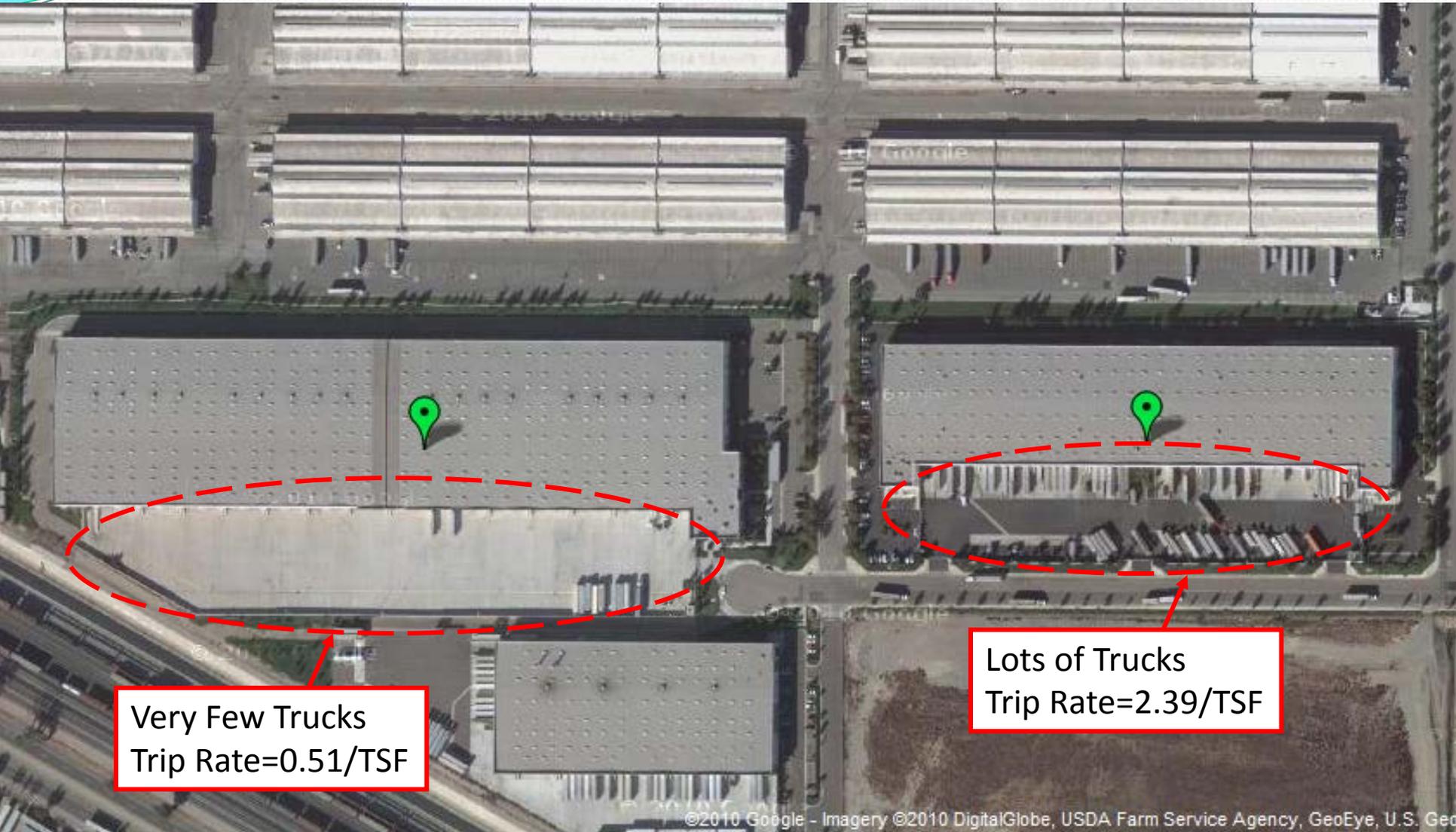
- For general plans or other projects with >10 warehouses, AQMD staff currently recommends the ITE average rate (1.44)
 - Projects with many warehouses likely to have diversity of warehouse types more similar to ITE average as a whole
- Alternatively can use project specific data with substantial evidence

AQMD Staff Rationale and Basis

- Overall trip rate of 2.57 trips/1,000 ft² provides:
 - Reasonable worst-case assumption sufficient for CEQA
 - Consistency with AQMD regional and localized thresholds based on peak daily activity
 - Default that can be replaced if project has enforceable throughput limit
- Truck trip percentage of 40% represents:
 - Average percentage from all available studies and is consistent with ITE ratio
- Investigation peer reviewed by traffic consultant



Oblique aerial photograph showing an example of a facility evaluated in the NAIOP San Bernardino County Truck Study. The truck trip rate for this facility was 1.13/TSF



Very Few Trucks
Trip Rate=0.51/TSF

Lots of Trucks
Trip Rate=2.39/TSF

Aerial photograph showing an example of two facilities evaluated in the NAIOP Riverside County Truck Study. Photo date may not coincide with timing of trip counts.

Potential Methods for Warehouse Trip Study

Two potential methods to supplement existing studies

1. ITE-like study using traffic counts enhanced with follow-up business surveys
 - 100 location-days of trip counts with sampling tubes on the street adjacent to warehouses
 - 50 warehouses for 2 days each, 25 warehouses for 4 days each, etc.
 - Business surveys would be sent out with significant fraction of businesses receiving phone call follow up
 - **BENEFIT:** Data from study can be sent directly to ITE for consideration for inclusion in next edition

Potential Methods for Warehouse Trip Study

2. Develop model that determines truck trips based on specifics of each development based on operational profile
 - Develop model/spreadsheet tool based on business surveys
 - Calibrate model with trip counts
 - Substantially less trip counts than other approach
 - Potential model parameters include:
 - Number of dock doors, floor area of operations, type of operations, availability of rail service, seasonality, others?
 - **BENEFIT:** Method is more similar to other goods movement land uses such as port berths, airports, rail yards, quarries, waste transfer stations, etc. Also, method provides better correlation between operations and trucking, rather than building size.

Questions for the Group

- Truck Count/Business Survey vs. Model Development vs. Other?
- What types of warehouse operations should be explicitly classified?
 - Cross-dock, Transload, Storage, Manufacturing/Assembly, More?
- Other Feedback?

Freight Trip Generation Study

Information you provide here will be kept confidential and will be used for planning purposes only

ESTABLISHMENT INFORMATION

Name: _____	Address: _____
City: _____	State: _____
ZIP: _____	

CONTACT INFORMATION FOR THE PERSON COMPLETING THE SURVEY

Name: _____	Position: _____
Phone number: _____	E-mail: _____

BUSINESS ACTIVITY (percent of business dedicated to this operation)

Nature of business:	Distribution Center _____%	Storage _____%	Cross Dock _____%	Manufacturing _____%
	Other (please specify): _____%			

TYPE OF ESTABLISHMENT

Is this the headquarters of the firm? YES NO

NUMBER OF PEOPLE TYPICALLY EMPLOYED AT THIS ADDRESS

Total employees in a typical day (office + others)	Full time		Part time	
	_____	_____	_____	_____

Is the work done at the premises performed in shifts? YES NO Total number of employees per shift: _____

Typical Operating Hours: M-F: _____ Sat: _____ Sun: _____

Peak day operations are approximately _____% higher than a typical day's operations.

Current operations are approximately _____% higher / lower (circle one) than the historical best year.

SITE AND GROSS FLOOR AREA

Is your establishment the only one at this site?	Total site area*	Establishment Floor Area*	# of Dock Doors
NO	_____	_____	_____
YES	N/A	_____	_____

* Specify units (e.g., sq. yds, sq. ft, acres)

NUMBER OF VEHICLES TYPICALLY OPERATED FROM THIS ADDRESS BY TYPE

Notes: (1) Include leased vehicles. See the diagram of vehicle types in the next question.
(2) If you do not know the answer fill it in using "n/a"

Cars: _____	4 or fewer axle single-trailer trucks: _____
Small pickups/vans: _____	5 axle single or multi-trailer trucks: _____
2 axle single unit trucks: _____	6 or more axle single or multi-trailer trucks: _____
3 or 4 axle single unit trucks: _____	others/ not specified: _____

TRIPS RELATED TO GOODS AND SUPPLIES

TYPICAL NUMBER OF DELIVERY TRIPS WITH THIS ADDRESS AS ORIGIN OR DESTINATION BY VEHICLE TYPE

In the table below, provide the average number of deliveries PER DAY or WEEK (e.g., for goods flowing through facility) If no information is available use "n/a". If the answer is zero use "0"

Description	Example	MADE FROM this address (deliveries to customers)	RECEIVED AT this address (deliveries to establishment)	Time unit
Cars				<input type="checkbox"/> per day <input type="checkbox"/> per week
Small pickups/vans				<input type="checkbox"/> per day <input type="checkbox"/> per week
2 axle single unit trucks				<input type="checkbox"/> per day <input type="checkbox"/> per week
Large trucks				<input type="checkbox"/> per day <input type="checkbox"/> per week
Other / Don't know				<input type="checkbox"/> per day <input type="checkbox"/> per week

TYPE OF CARGO PRODUCED AND RECEIVED BY THE ESTABLISHMENT

Type of cargo produced	Quantity	Unit (e.g., tons, lbs)	Type of cargo received	Quantity	Unit (e.g., tons, lbs)
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

TRIPS RELATED TO SERVICES

TYPICAL NUMBER OF SERVICE TRIPS WITH THIS ADDRESS AS ORIGIN OR DESTINATION BY VEHICLE TYPE

In the table below, provide the average number of service trips PER DAY/WEEK (e.g., mail delivery, landscaping service) If no information is available use "n/a". If the answer is zero use "0"

Description	Example	LEAVING this address	RECEIVED AT this address	Time unit
Cars				<input type="checkbox"/> per day <input type="checkbox"/> per week
Small pickups/vans				<input type="checkbox"/> per day <input type="checkbox"/> per week
2 axle single unit trucks				<input type="checkbox"/> per day <input type="checkbox"/> per week
Other / Don't know				<input type="checkbox"/> per day <input type="checkbox"/> per week

If you would like more information about the survey, please contact Mr. xxxxx (xxxx@xxx.xxx) at his/her e-mail address or call xxx-xxx-xxxx