CITY OF MANHATTAN BEACH
DEPARTMENT OF COMMUNITY DEVELOPMENT

TO: Parking and Public Improvements Commission

FROM: Richard Thompson, Director of Community Development
Ana Stevenson. Management Analyst

BY: Erik Zandvliet, Traffic Engineer

DATE: June 26, 2008

SUBJECT: **Evaluation of Traffic Safety Improvements at Aviation Boulevard at 12th Street and 19th Street**

RECOMMENDATION:

It is recommended that new traffic signal be installed at the intersection of Aviation Boulevard and 19th Street, and eastbound and northbound left turn movements be prohibited at Aviation Boulevard and 12th Street.

BACKGROUND:

Since June 2007, several residents and businesses have voiced their concerns about the difficulty in making turns at the intersections of Aviation Boulevard at 12th Street and Aviation Boulevard at 19th Street. In April 2008, a petition was submitted by Ms. Gordana Vukotich and signed by 18 residents requesting prohibition of northbound left turns at Aviation Boulevard and 19th Street due to an increase in collisions. Mr. Clifford Davis and Mr. Bill Rich, both local residents, noted the addition of a third southbound lane has made it more difficult to make left turns. In addition, Ms. Bonnie Bourgeois, owner and director of Magic Rainbow Pre-School, sent a letter with similar concerns and observations of an increase in traffic collisions.

This report is an analysis of the existing conditions at the two intersections and possible improvements to address the concerns. Public notices have been sent to residents along streets that may be affected, including Wendy Way, 12th Street and 19th Street, as well as persons that have voiced their concerns about this matter. The Traffic Engineer has also discussed this item with the City of Redondo Beach, since the east side of Aviation Boulevard is within their jurisdiction.

DISCUSSION:

EXISTING CONDITIONS

Aviation Boulevard is a north-south major arterial street with three lanes in each direction separated by a painted center median and left turn lanes. Aviation Boulevard has a traffic volume of approximately 38,000 vehicles per day and a speed limit of 40 mph. Parking is not permitted on either side of Aviation Boulevard. Aviation Boulevard is controlled with traffic signals at Marine

Avenue to the north, at Space Park Drive just south of 19th Street and Manhattan Beach Boulevard to the south. In 2005-07, the Los Angeles County Department of Public Works completed a project to improve circulation by widening Aviation Boulevard and constructing a third travel lane in each direction north of Manhattan Beach Boulevard.

12th Street is a two-lane local street that provides local access to nearby residences and a few local businesses. 12th Street has a traffic volume of approximately 1,000 vehicles per day and a posted speed limit of 25 mph. 12th Street intersects Aviation Boulevard approximately 240 feet to the north of Manhattan Beach Boulevard. The intersection has a northbound to westbound left turn pocket and eastbound traffic is stopped at Aviation Boulevard. The intersection is signed and marked with "KEEP CLEAR" markings to prohibit southbound queued cars from blocking left turn access. Curb parking is allowed on both sides of 12th Street. 12th Street terminates at Harkness Street to the west. The intersection has reduced sight visibility in the eastbound direction due to existing block walls and narrow sidewalks near the corner.

19th Street is a two-lane local street that provides local access to residents in the Liberty Village area. 19th Street has a traffic volume of approximately 1,500 vehicles per day and a posted speed limit of 25 mph. 19th Street intersects Aviation Boulevard approximately 950 feet south of Marine Avenue and 240 to the north of Space Park Drive. The intersection has a northbound to westbound left turn pocket, and eastbound traffic is stopped with left turns prohibited during peak commuting periods. The intersection is marked with "KEEP CLEAR" markings to prohibit southbound queued cars from blocking left turn access. Curb parking is allowed on both sides of 19th Street. 19th Street terminates at Meadows Avenue to the west. The intersection has reduced sight visibility in the eastbound direction due to existing block walls and narrow sidewalks near the corner.

The reported accident history was reviewed for a 3-year period between January 1, 2005 to December 31, 2007. This data was then used to determine if a recent 12-month period experienced five or more left-turn accidents at either intersection. The reported accident history for the period analyzed is shown Table 1.

Turning movement counts were collected on June 10, 2008 in all directions, during morning and evening peak hours between 7 to 9 a.m. and 2 to 6 p.m. on a normal school day. These hourly traffic volumes are used to determine the volumes of left turning traffic as well as the amount of delay or difficulty in making the turning movements. The turning movement count data is attached to this report. It should be noted that at both 12th Street and 19th Street, eastbound left turn movements are very low, likely due to the reduced sight distance and difficulty in crossing multiple lanes of busy traffic, even during the period when left turns are not restricted at 19th Street.

ANALYSIS

At unsignalized intersections, it is generally recommended that a traffic engineering study be conducted to evaluate existing conditions and consider many possible solutions before making a recommendation that could affect driver delay, congestion, access, driving distance, neighborhood impacts, future land use, and collision potential. For example, the decision for the installation of a traffic signal should not be based solely upon the standard State warrants, since traffic signals may increase certain types of collisions, such as rear-end type crashes. However, experience shows that the number of right-angle collisions may decrease after installation of signals. Improperly placed traffic signals may cause excessive delay, disobedience of the signal, diversion to alternate routes,

and increase accident frequency. Other less intrusive measures should be implemented before traffic signals are considered.

POTENTIAL TRAFFIC SAFETY MEASURES

The City Traffic Engineer evaluated several possible remedies to the increase in collisions noted in the accident history, as follows:

Peak Hour Turn Restrictions

Turning movements with high collision rates may be restricted during certain hours to reduce the likelihood of a collision. For example, northbound to westbound left turns could be restricted between 3 to 7pm at either 12th Street or 19th Street. This condition would target the primary collision time period, and the collision rate should be reduced. However, if implemented at 12th Street, this restriction would likely increase traffic volumes by about 30 vehicles in the peak hour on 19th Street, because 19th Street would become the preferred neighborhood access to the Liberty Village area from Aviation Boulevard. If implemented at 19th Street, left turn volumes would likely increase at 12th Street. In the absence of traffic safety measures at the other intersection, the overall collision potential may not be reduced at all.

Eastbound to northbound left turn restrictions, such as the existing restriction on 19th Street at Aviation Boulevard, could be implemented at 12th Street during peak hours. This would be expected to reduce the collision potential at the intersection, since there would be fewer points of conflict between vehicles.

Prohibited Turn Movements

The same turn restrictions identified above could be implemented on a permanent basis, prohibiting left turns all day. This would reduce driver confusion and potential for violations, since drivers would quickly become accustomed to the prohibition, regardless of the time-of-day. However, the prohibition may be unnecessarily restrictive during off-peak periods of low volume, when the gaps in traffic are large and the potential for collisions is less. Such a prohibition would have a greater impact on redirecting traffic to the other access points to the neighborhood. It should be noted that conflicts with southbound traffic would not be significantly different for eastbound right turning traffic, because drivers entering Aviation would still have to enter the southbound lanes. Prohibiting all eastbound traffic would in essence result in a one-way westbound street (see below).

Lane Reduction

Since the collision rate appears to have increased after the third lane was added on Aviation Boulevard, reversing this condition was also considered. However, traffic volumes on Aviation Boulevard have continued to increase, and two lanes would significantly impair the ability for drivers to find gaps in the traffic flow in which to make turns at the intersection. Reduced lanes would decrease capacity on Aviation Boulevard, resulting in a cascade of adverse impacts, including congested intersections, longer commute times, more congestion, and an extended rush hour. This, in turn, would also increase the potential for an increase in non-resident cut-through traffic in our neighborhoods.

Improved Visibility

The existing block walls along the west side of Aviation Boulevard could be moved westerly to widen the parkway, thereby increasing the sight distance for eastbound traffic. This would permit

drivers to observe oncoming traffic and make a better judgment in entering Aviation Boulevard. It should be noted that drivers making eastbound left turns would still have to cross at least four lanes of traffic to enter a northbound lane. While this improvement would generally benefit eastbound traffic, it would not reduce the collision potential for northbound left turns. Also, it would require a partial property acquisition by the City that would reduce the depth of several adjacent residential backyards along Aviation Boulevard.

Stop Signs

Stop signs in all directions are not appropriate at either intersection due to the nature and operation of the major arterial street. Stop signs are rarely used on multi-lane streets. Aviation Boulevard carries in excess of 37,000 vehicles per day, and stop signs would not be able to handle the approach volumes. Stop signs would create significant rear-end collision potential because drivers would not expect a stop sign on a signalized street.

One-Way Street

12th Street or 19th Street could be designated a one-way street between Wendy Way and Aviation Boulevard in the westbound direction. While this measure would remove the collision potential for eastbound movements, it would redirect neighborhood traffic to other access points, such as Harkness Street which has limited access at Marine Avenue and is not signalized at Manhattan Beach Boulevard. It may also adversely impact access to the adjacent residences with garages on this street segment. Again, if additional traffic safety measures at the other intersection are not made, the overall collision potential may not be reduced at all.

Traffic Signal

The guidelines provided in the California Manual of Traffic Control Devices and the data collected for this study were used to perform a traffic signal warrant checklist at both Aviation Boulevard at 12th Street and Aviation Boulevard at 19th Street. These criteria have been widely accepted nationwide and are used by the City of Manhattan Beach. The installation of a traffic signal may be considered if one or more of the warrants are met. The findings indicate that two traffic signal warrants are met at Aviation Boulevard and 19th Street (four-hour and peak hour warrants), and no warrants are met at Aviation Boulevard and 12th Street. It was noted that the collision warrant is met for both intersections based on the number of collisions, but not the minimum volumes. However, a traffic signal with left turn arrows would directly address the types of collisions experienced at either intersection. Traffic signal installation costs including design and construction management would be approximately $300,000.

CONCLUSION

The City Traffic Engineer has evaluated the potential reduction in collisions for each potential traffic safety measure, and weighed it against any adverse impacts to the neighborhood and the driving public. In addition, the appropriateness of the measures within the community was considered. It is important that any improvements made at one intersection not adversely impact the overall collision rate at other intersections, so a comprehensive approach is advised.

A new traffic signal at Aviation Boulevard and 19th would be the most appropriate improvement Street because this location is centrally located in Liberty Village, provides the best access to the majority of residents, and would have the least potential for "gridlock" from adjacent traffic signals.

The new traffic signal would be compatible with the existing traffic controls along Aviation Boulevard. This improvement would then allow residents to make protected eastbound left turns, and would not restrict any turn movements.

At Aviation Boulevard and 12th Street, a new traffic signal is not recommended, due to the failure to meet national warrants and the proximity to the existing traffic signal at Manhattan Beach Boulevard. Since Manhattan Beach Boulevard carries high traffic volumes, traffic backs up on Aviation Boulevard through the intersection at 12th Street. The addition of a new signal at 12th Street would introduce a stacking condition that could cause "gridlock" and other vehicle conflicts such as blocked views. Since a signalized left turn would be provided at 19th Street, it is recommended that northbound left turns at 12th Street be prohibited at all times. This would eliminate the current vehicle conflicts that have resulted in the recent collision history at this intersection. Further, since the existing eastbound left turn volumes are very low and sight distance is restricted, eastbound left turns should also be prohibited and the street restriped to enhance eastbound right turn sight distance. The northbound left turn prohibition at 12th Street could be implemented immediately as an interim measure before a traffic signal is installed at 19th Street.

The implementation of these measures will be expected to generate minor changes in neighborhood access for a small percentage of residents, but overall safety will be greatly improved and traffic volume shifts would be negligible. Daily traffic volumes on 12th Street are expected to decrease by about 300 vehicles per day (30 vehicles in the peak hour), while volumes on 19th Street east of Harkness Street would increase by an equivalent amount.

Attachments:

1. Collision History
2. Turning Movement Counts
3. Aerial Photo: Aviation Blvd. at 19th St.
4. Aerial Photo: Aviation Blvd. at 12th St.
5. Traffic Signal Warrant Checklist: Aviation Blvd. at 19th St.
6. Traffic Signal Warrant Checklist: Aviation Blvd. at 12th St.
7. Related Correspondence
8. Resident Petition for Aviation/19th
9. Notice Letter

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ATTACHMENT 1: COLLISION HISTORY

TABLE 1

CITY OF MANHATTAN BEACH

TRAFFIC SIGNAL WARRANT
ACCIDENT GUIDELINE SUMMARY

Aviation Boulevard and 12th Street
January 1, 2005 to July 31, 2007

DATE	TIME	DIRECTION	TYPE	REASON
2005		NONE		
1/5/2006	18:18	EB LEFT VS. SB THRU	BROADSIDE	UNSAFE TURN
2/28/2007	08:41	NB LEFT VS. SB THRU*	BROADSIDE	UNSAFE TURN
3/26/07	17:14	EB THRU VS. SB THRU	BROADSIDE	UNSAFE ENTER
4/6/2007	15:58	NB LEFT VS. BS THRU*	BROADSIDE	UNSAFE TURN
4/27/2007	18:45	NB LEFT VS. SB THRU*	BROADSIDE	UNSAFE TURN
6/20/2007	19:56	NB LEFT VS. SB THRU*	BROADSIDE	UNSAFE TURN
6/25/07	18:17	NB LEFT VS. SB THRU*	BROADSIDE	UNSAFE TURN
6/25/2007	19:18	EB RIGHT VS. SB THRU	SIDESWIPE	UNSAFE TURN
7/6/2007	19:21	NB LEFT VS. SB THRU*	BROADSIDE	UNSAFE TURN

* - Left turn collision

Aviation Boulevard and 19th Street
January 1, 2005 to December 31, 2007

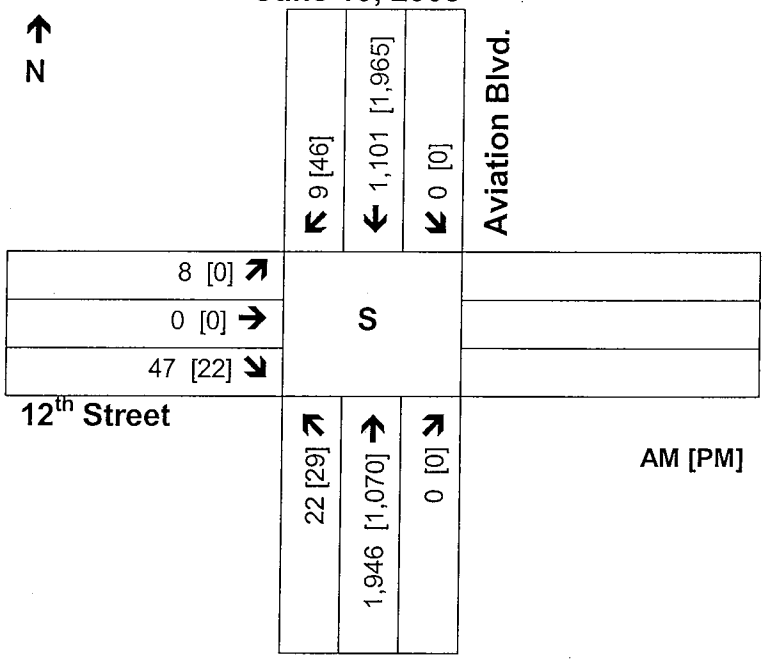
DATE	TIME	DIRECTION	TYPE	REASON
2005		NONE		
2006		NONE		
4/26/07	17:28	NB LEFT VS. SB THRU*	BROADSIDE	UNSAFE TURN
5/22/2007	17:51	NB LEFT VS SB THRU*	BROADSIDE	UNSAFE TURN
7/13/2007	16:24	NB LEFT VS SB THRU*	BROADSIDE	UNSAFE TURN
7/17/2007	18:51	NB LEFT VS SB THRU*	BROADSIDE	UNSAFE TURN
11/28/07	17:49	NB LEFT VS SB THRU*	BROADSIDE	UNSAFE TURN

* - Left turn collision

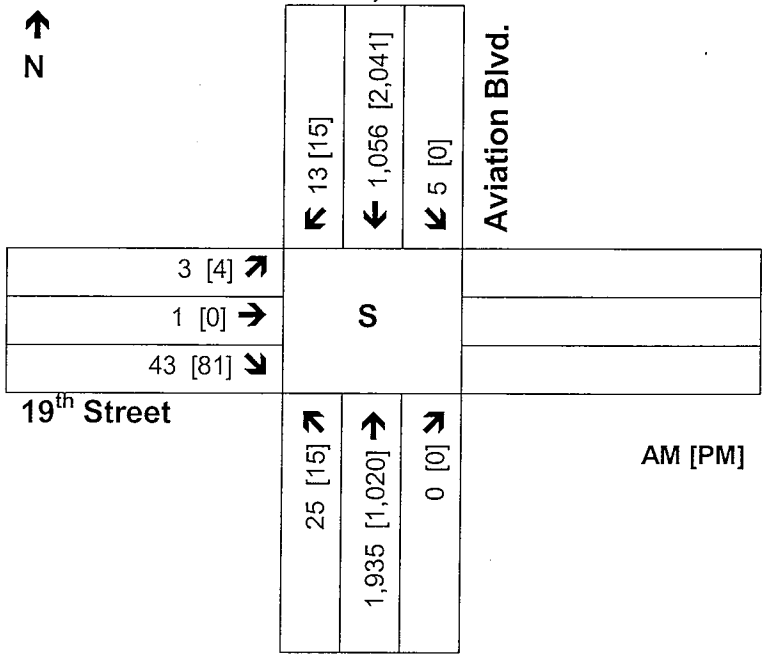
ATTACHMENT 2: TURNING MOVEMENTS COUNTS

TABLE 2
CITY OF MANHATTAN BEACH

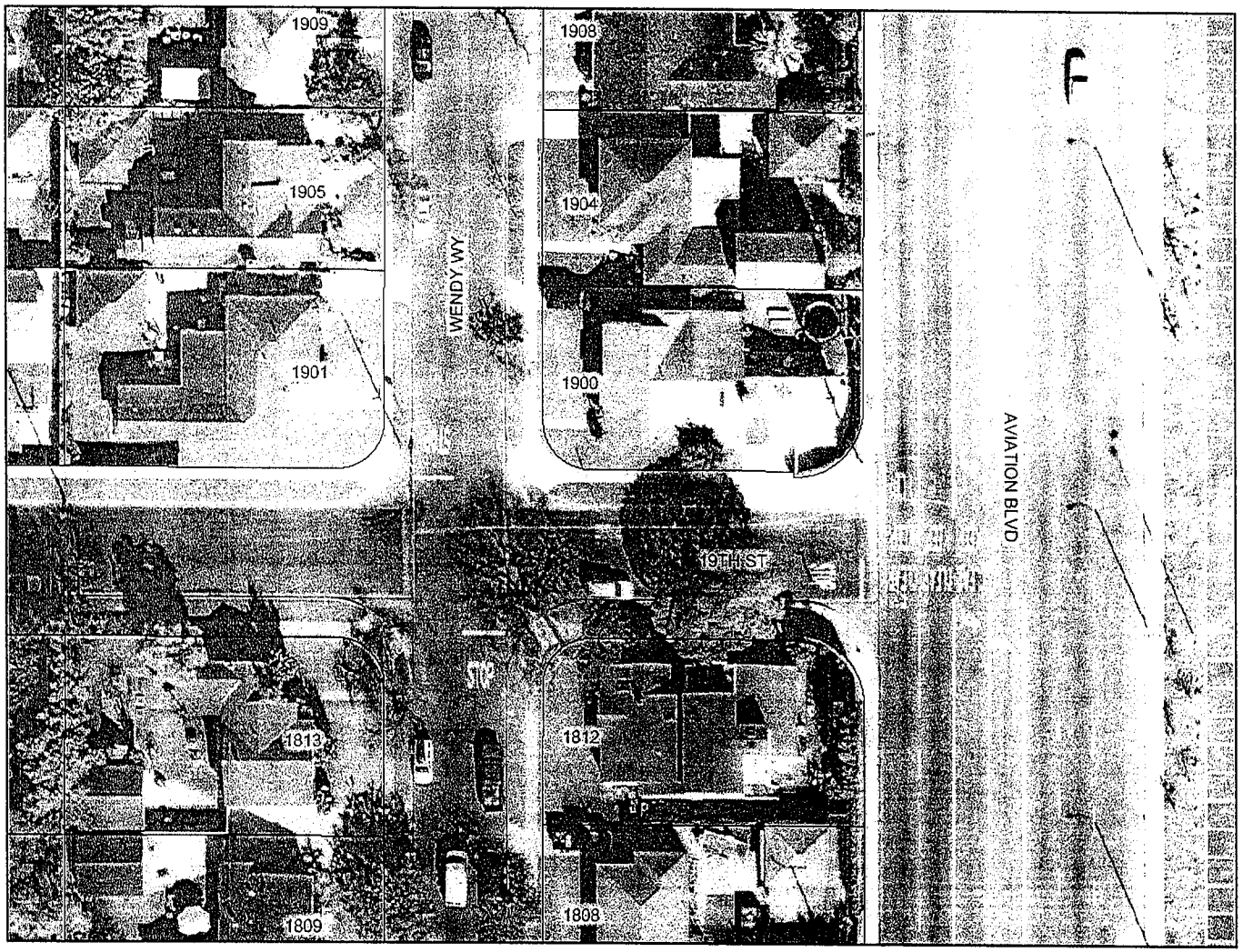
PEAK HOUR TURNING MOVEMENT COUNTS
Aviation Boulevard and 12th Street
June 10, 2008



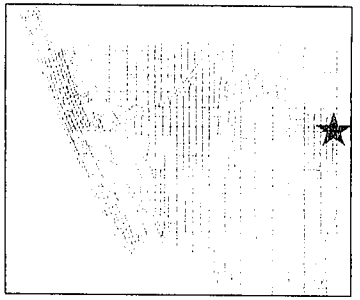
Aviation Boulevard and 19th Street
June 10, 2008



AVIATION BLVD. AT 19TH STREET



0 60 120 180 ft.



Legend

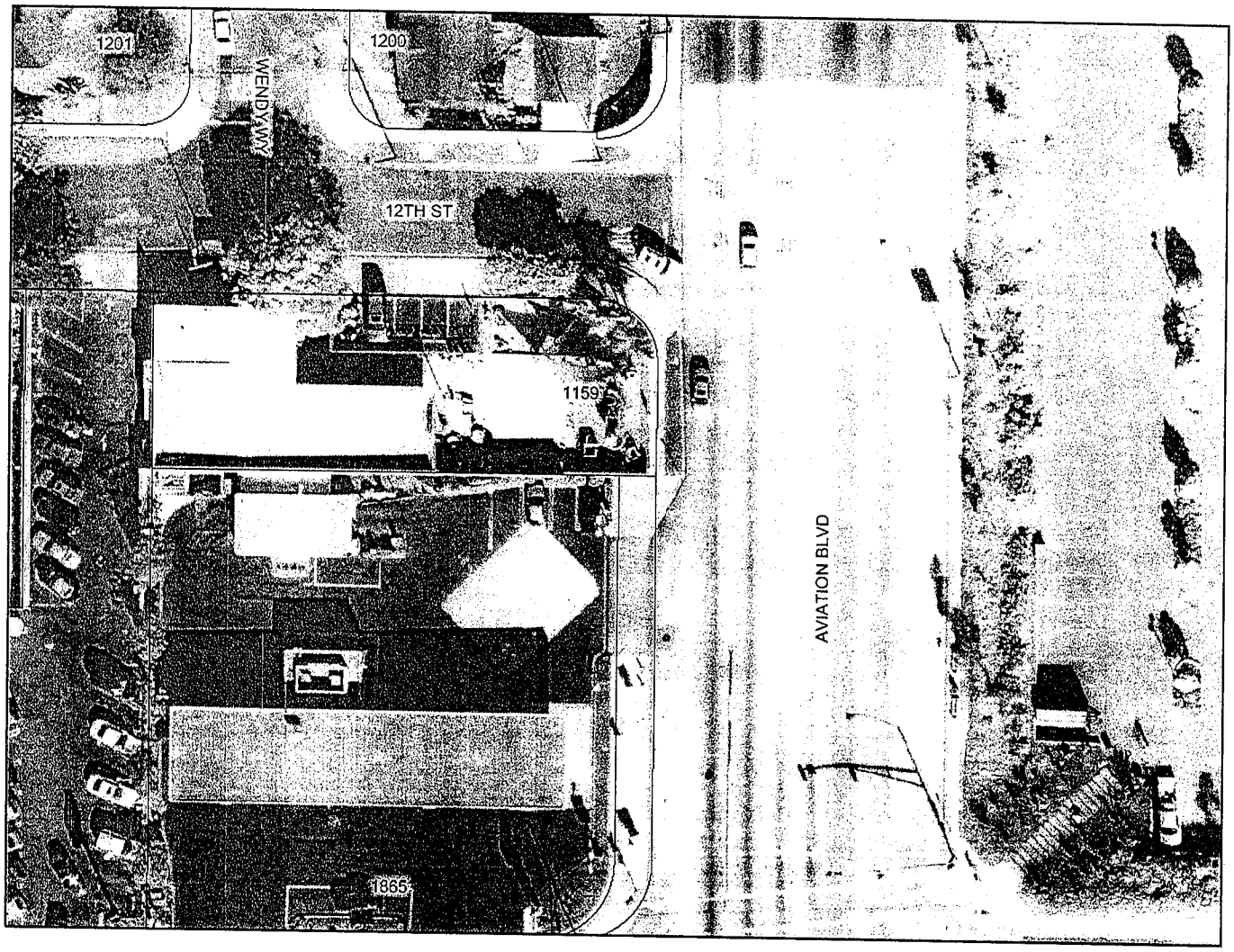
- Addresses
- Parcels
- 2006 4in color Basemap
- BEACH
- BLOCK
- DEADEND
- PARK
- PIER
- PRIVATE STREET
- SCHOOL
- STREET
- WALK STREET

N

Scale: 1:635

This map is a user-generated static output from the "MB GIS Info" Intranet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

AVIATION BLVD. AT 12TH STREET



0 60 120 180 ft.

Legend

- Addresses
- Parcels
- 2006 4in color Basemap
- BEACH
- BLOCK
- DEADEND
- PARK
- PIER
- PRIVATE STREET
- SCHOOL
- STREET
- WALK STREET

N

Scale: 1:635

This map is a user-generated static output from the "MB GIS Info" Intranet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

ATTACHMENT 5

City of Manhattan Beach

Aviation Boulevard at 19th Street

Prepared By Willdan Engineering

Signal Warrants - Summary

Major Street Approaches

Northbound: **Aviation Blvd**
Number of Lanes: **2**
Approach Speed: **44**
Total Approach Volume: **7,848**

Southbound: **Aviation Blvd**
Number of Lanes: **2**
Approach Speed: **44**
Total Approach Volume: **8,976**

Minor Street Approaches

Eastbound: **19th St**
Number of Lanes: **1**

Total Approach Volume: **412**

Warrant Summary (Rural values apply.)

Warrant 1 - Eight Hour Vehicular Volumes ..... Not Satisfied

Warrant 1A - Minimum Vehicular Volume .....Not Satisfied
Required volumes reached for 0 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic .....Not Satisfied
Required volumes reached for 4 hours, 8 are needed

Warrant 1 A&B - Combination of Warrants .....Not Satisfied
Required volumes reached for 2 hours, 8 are needed

Warrant 2 - Four Hour Volumes ..... **Satisfied**
Number of hours (4) volumes exceed minimum >= minimum required (4).

Warrant 3 - Peak Hour ..... **Satisfied**

Warrant 3A - Peak Hour Delay .....Not Satisfied
Approach volumes on minor street don't exceed minimums for any hour. Delay data not evaluated.

Warrant 3B - Peak Hour Volumes .....Satisfied
Volumes exceed minimums for at least one hour.

Warrant 4 - Pedestrian Volumes ..... Not Satisfied
Required 4 Hr pedestrian volume reached for 0 hour(s) and the single hour volume for 0 hour(s)

Warrant 5 - School Crossing ..... Not Satisfied
Number of gaps > .0 seconds (0) exceeds the number of minutes in the crossing period (0).

Warrant 6 - Coordinated Signal System ..... Not Satisfied
Nearest coordinated signal (280) is less than 1,000 feet away.

Warrant 7 - Crash Experience ..... Not Satisfied
Number of accidents (5) meet minimum (5) but volumes do not.

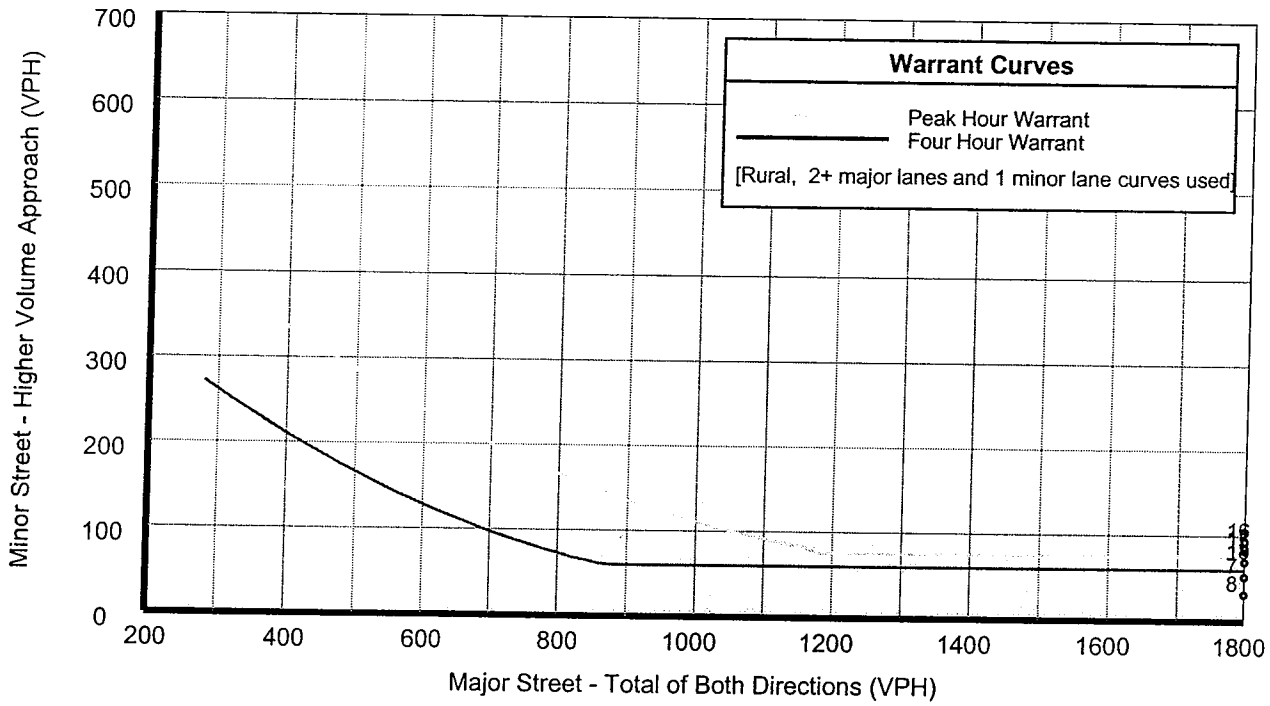
Warrant 8 - Roadway Network ..... Not Satisfied
Major Route conditions met. Volume requirements met.

City of Manhattan Beach

Aviation Boulevard at 19th Street

Prepared By Willdan Engineering

Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

Hour Begin	Major Total	Higher Minor Vol	Higher Minor Dir	War-1A Major Crit	War-1A Minor Crit	War-1A Meets?	War-1B Major Crit	War-1B Minor Crit	War-1B Meets?	War-1A&B Major Crit	War-1A&B Minor Crit	War-1A&B Meets?
00:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
01:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
02:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
03:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
04:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
05:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
06:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
07:00	2,772	52	EB	420-Yes	105-No	Major	630-Yes	53-No	Major	504-Yes	84-No	Major
08:00	3,031	31	EB	420-Yes	105-No	Major	630-Yes	53-No	Major	504-Yes	84-No	Major
09:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
10:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
11:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
12:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
13:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
14:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
15:00	2,567	82	EB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-No	Major
16:00	2,791	93	EB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-Yes	Both
17:00	3,091	85	EB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-Yes	Both
18:00	2,572	69	EB	420-Yes	105-No	Major	630-Yes	53-Yes	Both	504-Yes	84-No	Major
19:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
20:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
21:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
22:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---
23:00	0	0	EB	420-No	105-No	---	630-No	53-No	---	504-No	84-No	---

ATTACHMENT 6

City of Manhattan Beach

Aviation Boulevard at 12th Street

Prepared By Willdan Engineering

Signal Warrants - Summary

Major Street Approaches

Northbound: **Aviation Blvd**
Number of Lanes: **2**
Approach Speed: **44**
Total Approach Volume: **7,994**

Southbound: **Aviation Blvd**
Number of Lanes: **2**
Approach Speed: **44**
Total Approach Volume: **8,979**

Minor Street Approaches

Eastbound: **12th St**
Number of Lanes: **1**

Total Approach Volume: **185**

Warrant Summary (Rural values apply.)

Warrant 1 - Eight Hour Vehicular Volumes ..... **Not Satisfied**

Warrant 1A - Minimum Vehicular Volume .....**Not Satisfied**
Required volumes reached for 0 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic .....**Not Satisfied**
Required volumes reached for 1 hours, 8 are needed

Warrant 1 A&B - Combination of Warrants .....**Not Satisfied**
Required volumes reached for 0 hours, 8 are needed

Warrant 2 - Four Hour Volumes ..... **Not Satisfied**
Number of hours (0) volumes exceed minimum < minimum required (4).

Warrant 3 - Peak Hour ..... **Not Satisfied**

Warrant 3A - Peak Hour Delay .....**Not Satisfied**
Approach volumes on minor street don't exceed minimums for any hour. Delay data not evaluated.

Warrant 3B - Peak Hour Volumes .....**Not Satisfied**
Volumes do not exceed minimums for any hour.

Warrant 4 - Pedestrian Volumes ..... **Not Satisfied**
Required 4 Hr pedestrian volume reached for 0 hour(s) and the single hour volume for 0 hour(s)

Warrant 5 - School Crossing ..... **Not Satisfied**
Number of gaps > .0 seconds (0) exceeds the number of minutes in the crossing period (0).

Warrant 6 - Coordinated Signal System ..... **Not Satisfied**
Nearest coordinated signal (290) is less than 1,000 feet away.

Warrant 7 - Crash Experience ..... **Not Satisfied**
Number of accidents (6) meet minimum (5) but volumes do not.

Warrant 8 - Roadway Network ..... **Not Satisfied**
Major Route conditions met. Volume requirements met.