

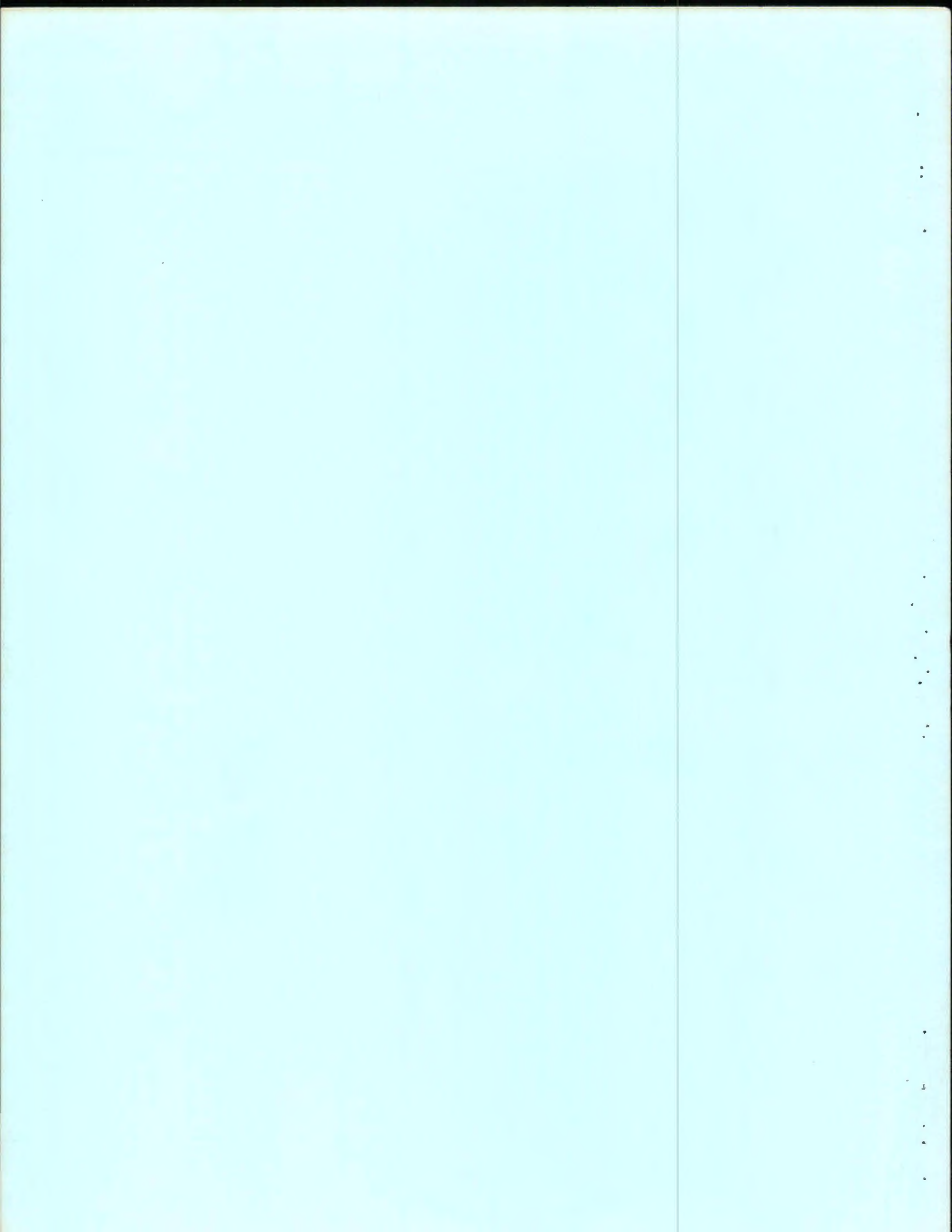
FUEL EFFICIENT TRAFFIC SIGNAL MANAGEMENT PROGRAM (FETSIM)

RESULTS OF 1993 FETSIM PROJECT

CITY OF PASADENA

**Prepared by:
Public Works and Transportation Department
March, 1994**

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MEMORANDUM - CITY OF PASADENA

DATE: March 17, 1994
TO: City Manager
FROM: Director of Public Works and Transportation
RE: Council Letter Item

Update of 1993 Fuel Efficient Traffic Signal Management (FETSIM) Project

Staff recently completed the 1993 State of California Fuel Efficient Traffic Signal Management (FETSIM) project. This was the sixth FETSIM project undertaken by the City for a total of 244 signalized intersections to be retimed by FETSIM projects since 1987.

The 1993 FETSIM project included 90 traffic signals in the City's Downtown area. Staff received excellent results from the project. A comparison of "Before" and "After" travel time and delay studies performed on Del Mar Boulevard, Fair Oaks Avenue, Lake Avenue and Colorado Boulevard resulted in an average reduction in travel time up to 29%, an average reduction in delay up to 68% and an average reduction in the number of stops up to 52%. The reduction in travel time means that the time it takes a vehicle to travel along the four (4) routes will, on average, be 3 minutes and 15 seconds less than the time it took before the FETSIM project, due to the reduction in delay and the number of stops. The annual cost savings to the public due to the reduction in travel time amounts to over \$4.87 million with an estimated fuel savings of 680,000 gallons. Other benefits include a reduction in air pollution and accidents and an increase in public safety.

Of significant importance is the fact that the volume of traffic on Del Mar Boulevard increased by about 20% due to the De-emphasizing of California Boulevard but by optimizing the traffic signal timing, staff was still able to reduce travel time on Del Mar Boulevard by an average of 23%, reduce delay by an average of 50% and reduce the number of stops by an average of 48%. This is an example of how optimizing traffic signal timing will help make the City's mobility corridors attractive when diverting traffic from the de-emphasized streets identified in the General Plan.

An example of how the new timing helps regulate traffic and controls speed is demonstrated in the attached speed profile graphs for the AM peak of Fair Oaks Avenue. The Before study speed profile graph shows how traffic would stop at some of the traffic signals (represented by the valleys) and then accelerate up to speeds close to 40 mph to try and make it through the next signal. The After study speed profile graph shows that by improving the traffic signal timing the vehicles are no longer stopping at the signals and the speed of traffic is not exceeding 35 mph.

Traffic signal timing optimization projects have a significant importance in assisting the City in meeting the traffic management portion of the responsibilities outlined in the Mobility Element of the General Plan. The 1993 FETSIM project is just an example of how beneficial traffic signal synchronization projects are.

RESULTS OF FETSIM 1993 PROJECT (4 ROUTES)

Route #1: Del Mar Blvd. (Fair Oaks Ave. to Wilson Ave.), 12 traffic signals
Route #2: Fair Oaks Ave. (Holly St. to Bellefontaine Ave.), 7 traffic signals
Route #3: Lake Ave. (Union St. to California Blvd.), 8 traffic signals
Route #4: Colorado Blvd. (Delacey Ave. to Wilson Ave.), 17 traffic signals

Average travel time before improvements (4 routes) = 16 mins and 46 secs
Average travel time after improvements (4 routes) = 13 mins and 31 secs

TRAVEL TIME	DELAY (Under 10 mph)	STOPS
Reduced by 19.5%, 3 mins and 15 secs	Reduced by 42.1%	Reduced by 34.2%

TRAVEL TIME: The elapsed time to travel on a specified route.
DELAY: The time that a vehicle travels below the speed of 10 mph.
STOPS: The number of times a vehicle travels below the speed of 3.5 mph.

**RESULTS OF ROUTES WHICH ARE PRINCIPAL MOBILITY CORRIDORS
(Del Mar Blvd./Fair Oaks Ave./Lake Ave.)**

Average travel time before improvements (3 routes) = 11 mins and 26 secs
Average travel time after Improvements (3 routes) = 8 mins and 38 secs

TRAVEL TIME	DELAY (Under 10 mph)	STOPS
Reduced by 24.5%, 2 mins and 48 secs	Reduced by 51.8%	Reduced by 41.8%

DEL MAR BOULEVARD (Fair Oaks Avenue to Wilson Avenue)

Average travel time before improvements = 4 minutes and 29 seconds
Average travel time after improvements = 3 minutes and 27 seconds

	TRAVEL TIME	DELAY (Under 10 mph)	STOPS
AM Peak/Eastbound	-24.2%, -62.6 secs	-66.4%	-66.7%
AM Peak/Westbound	-16.7%, -40.6 secs	-37.0%	-30.8%
OFF Peak/Eastbound	-28.6%, -79.1 secs	-65.4%	-57.1%
OFF Peak/Westbound	-32.4%, -94.6 secs	-71.0%	-55.0%
PM Peak/Eastbound	-25.7%, -71.1 secs	-46.2%	-59.5%
PM Peak/Westbound	-11.4%, -26.9 secs	-14.5%	-17.1%
AVERAGE:	-23.2%, -62.5 secs	-50.1%	-47.7%

Note: AM Peak/Westbound: Traffic volume increased by 22.4%
PM Peak/Eastbound: Traffic volume increased by 17.5%

FAIR OAKS AVENUE (Holly Street to Bellefontaine Street)

Average travel time before improvements = 3 minutes and 37 seconds
Average travel time after improvements = 2 minutes and 35 seconds

	TRAVEL TIME	DELAY (Under 10 mph)	STOPS
AM Peak/Southbound	-29.0%, -57.0 secs	-80.0%	-71.9%
AM Peak/Northbound	-26.7%, -49.9 secs	-67.6%	-43.5%
OFF Peak/Southbound	-32.4%, -79.3 secs	-67.9%	-40.5%
OFF Peak/Northbound	-20.6%, -46.8 secs	-41.8%	-43.8%
PM Peak/Southbound	-36.1%, -88.3 secs	-75.0%	-58.1%
PM Peak/Northbound	-26.7%, -50.9 secs	-73.2%	-56.5%
AVERAGE:	-28.6%, -62.0 secs	-67.6%	-52.4%

LAKE AVENUE (Union Street to California Boulevard)

Average travel time before improvements = 3 minutes and 20 seconds

Average travel time after improvements = 2 minutes and 36 seconds

	TRAVEL TIME	DELAY (Under 10 mph)	STOPS
AM Peak/Southbound	-25.7%, -48.8 secs	-52.3%	-32.3%
AM Peak/Northbound	-9.7%, -16.2 secs	-24.0%	+3.8%
OFF Peak/Southbound	-30.8%, -64.8 secs	-57.0%	-44.7%
OFF Peak/Northbound	-7.7%, -14.3 secs	-2.9%	0.0%
PM Peak/Southbound	-26.3%, -58.4 secs	-50.7%	-31.0%
PM Peak/Northbound	-32.4%, -63.5 secs	-39.2%	-47.6%
AVERAGE:	-22.1%, -44.3 secs	-37.7%	-25.3%

COLORADO BOULEVARD (DeLacey Avenue to Wilson Avenue)

Average travel time before improvements = 5 minutes and 20 seconds

Average travel time after improvements = 4 minutes and 53 seconds

	TRAVEL TIME	DELAY (Under 10 mph)	STOPS
AM Peak/Eastbound	-2.8%, -10.4 secs	-11.8%	-3.3%
AM Peak/Westbound	-10.3%, -26.4 secs	0.0%	+2.8%
OFF Peak/Eastbound	-7.3%, -24.6 secs	0.0%	-5.3%
OFF Peak/Westbound	-6.5%, -24.1 secs	-11.1%	-15.0%
PM Peak/Eastbound	-19.5%, -61.2 secs	-47.1%	-40.5%
PM Peak/Westbound	-4.8%, -16.7 secs	-6.7%	-7.1%
AVERAGE:	-8.5%, -27.2 secs	-12.8%	-11.4%

BEFORE/AFTER STUDIES
DEL MAR BOULEVARD (Fair Oaks Avenue to Wilson Avenue)
Eastbound, AM Peak

PC-Travel, Version 1.5

Summary of Travel Study: BDMAM2.TRV

Date/Time of Report: 02/24/94; 12:11

BEFORE STUDY:

DEL MAR BLVD, EASTBOUND
AM PEAK, 5/04/93

Overall Output Statistics:

Section			Before Runs						After Runs					
Num	Length	Name	Travel Time	Stops	Speed (mph)	Time Below			Travel Time	Stops	Speed (mph)	Time Below		
						0 mph	10 mph	30 mph				0 mph	10 mph	30 mph
1	292	FAIROAKS	22.6	0.7	8.8	9.2	12.8	22.2	0.0	0.0	0.0	0.0	0.0	0.0
2	505	RAYMOND	24.1	0.6	14.3	7.5	10.6	20.2	0.0	0.0	0.0	0.0	0.0	0.0
3	462	ARROYO	26.6	0.5	11.8	9.5	12.7	25.9	0.0	0.0	0.0	0.0	0.0	0.0
4	435	MARENGO	20.7	0.5	14.3	3.3	6.7	20.6	0.0	0.0	0.0	0.0	0.0	0.0
5	921	EUCLID	32.0	0.6	19.6	8.0	11.0	18.5	0.0	0.0	0.0	0.0	0.0	0.0
6	441	LOS ROBLES	16.9	0.4	17.8	4.2	6.9	10.8	0.0	0.0	0.0	0.0	0.0	0.0
7	1369	EL MOLINO	29.8	0.0	31.3	0.0	0.9	8.5	0.0	0.0	0.0	0.0	0.0	0.0
8	513	OAK KNOLL	22.7	0.7	15.4	2.3	8.2	21.2	0.0	0.0	0.0	0.0	0.0	0.0
9	380	HUDSON	8.8	0.0	29.4	0.0	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0
10	492	LAKE	10.0	0.0	33.5	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
11	466	MENTOR	9.2	0.0	34.5	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0
12	774	WILSON	33.0	0.7	16.0	13.4	17.3	21.8	0.0	0.0	0.0	0.0	0.0	0.0
Overall			256.4	4.7	18.7	57.4	87.1	175.7	0.0	0.0	0.0	0.0	0.0	0.0

Number of Before Runs: 10; Number of After Runs: 0

Overall Output Statistics:

Section			Before Runs						After Runs					
Num	Length	Name	Travel Time	Stops	Speed (mph)	Time Below			Travel Time	Stops	Speed (mph)	Time Below		
						0 mph	10 mph	30 mph				0 mph	10 mph	30 mph
1	151	FAIROAKS	0.0	0.0	0.0	0.0	0.0	0.0	19.4	0.6	5.3	10.0	13.9	19.4
2	443	RAYMOND	0.0	0.0	0.0	0.0	0.0	0.0	11.8	0.0	25.7	0.0	0.0	11.6
3	402	ARROYO	0.0	0.0	0.0	0.0	0.0	0.0	16.1	0.4	17.0	0.4	3.4	16.1
4	420	MARENGO	0.0	0.0	0.0	0.0	0.0	0.0	11.3	0.0	25.5	0.0	0.0	10.5
5	847	EUCLID	0.0	0.0	0.0	0.0	0.0	0.0	20.6	0.0	28.0	0.0	0.0	13.8
6	420	LOS ROBLES	0.0	0.0	0.0	0.0	0.0	0.0	10.1	0.0	28.3	9.0	0.0	8.0
7	1263	EL MOLINO	0.0	0.0	0.0	0.0	0.0	0.0	28.0	0.0	30.8	0.0	0.0	11.9
8	462	OAK KNOLL	0.0	0.0	0.0	0.0	0.0	0.0	10.9	0.0	29.0	0.0	0.0	6.3
9	367	HUDSON	0.0	0.0	0.0	0.0	0.0	0.0	12.1	0.1	20.6	0.6	2.8	9.8
10	438	LAKE	0.0	0.0	0.0	0.0	0.0	0.0	11.8	0.0	25.4	0.0	0.0	11.3
11	457	MENTOR	0.0	0.0	0.0	0.0	0.0	0.0	18.1	0.3	17.2	4.6	6.4	14.0
12	711	WILSON	0.0	0.0	0.0	0.0	0.0	0.0	23.6	0.3	20.5	0.4	2.6	19.6
Overall			0.0	0.0	0.0	0.0	0.0	0.0	193.8	1.6	22.5	16.0	29.0	152.1

Number of Before Runs: 0; Number of After Runs: 8

PC-Travel, Version 1.5

Summary of Travel Study: BDMAM2.TRV

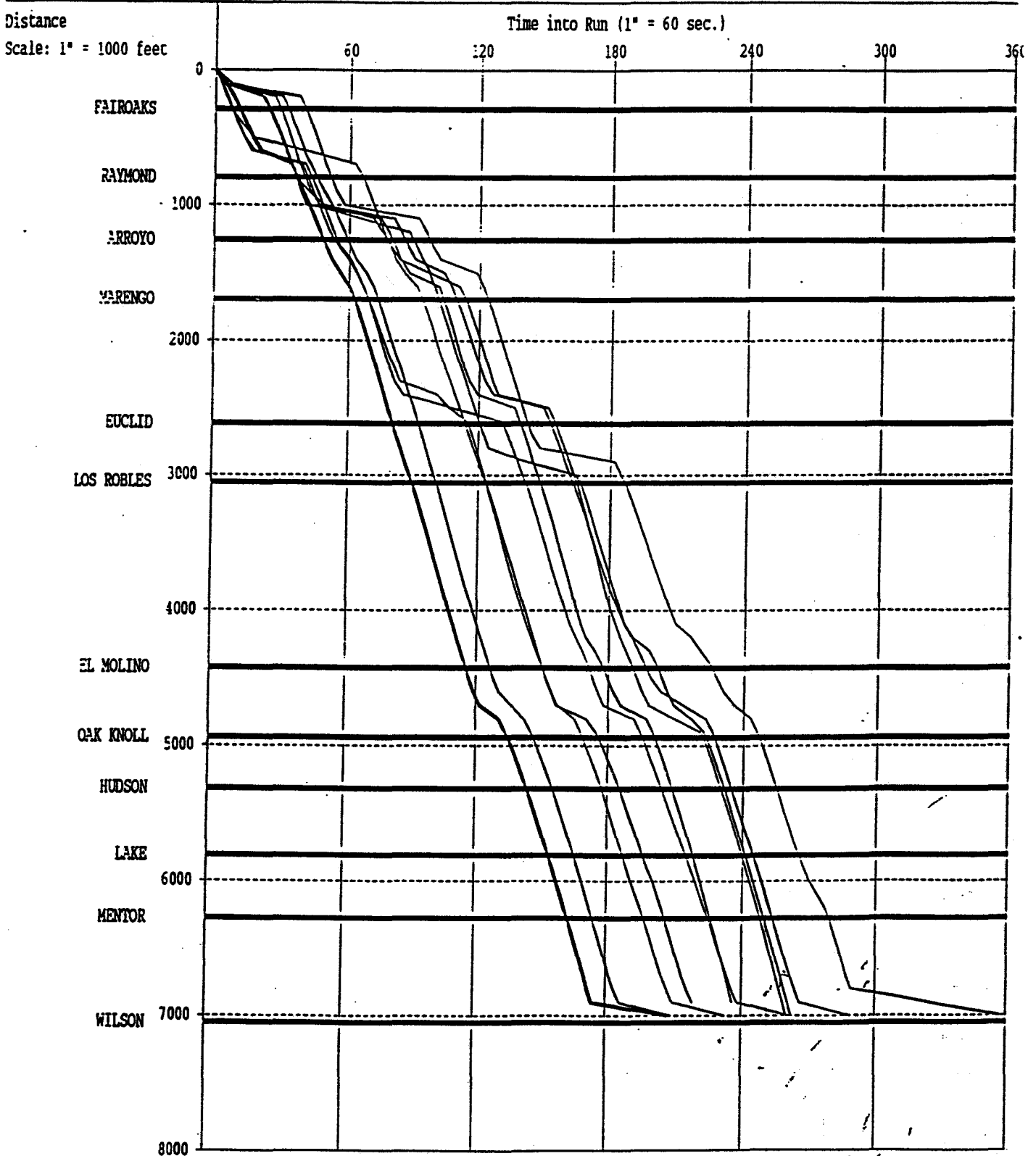
Date/Time of Report: 02/24/94; 12:11

BEFORE STUDY:

DEL MAR BLVD, EASTBOUND
AM PEAK, 5/04/93.

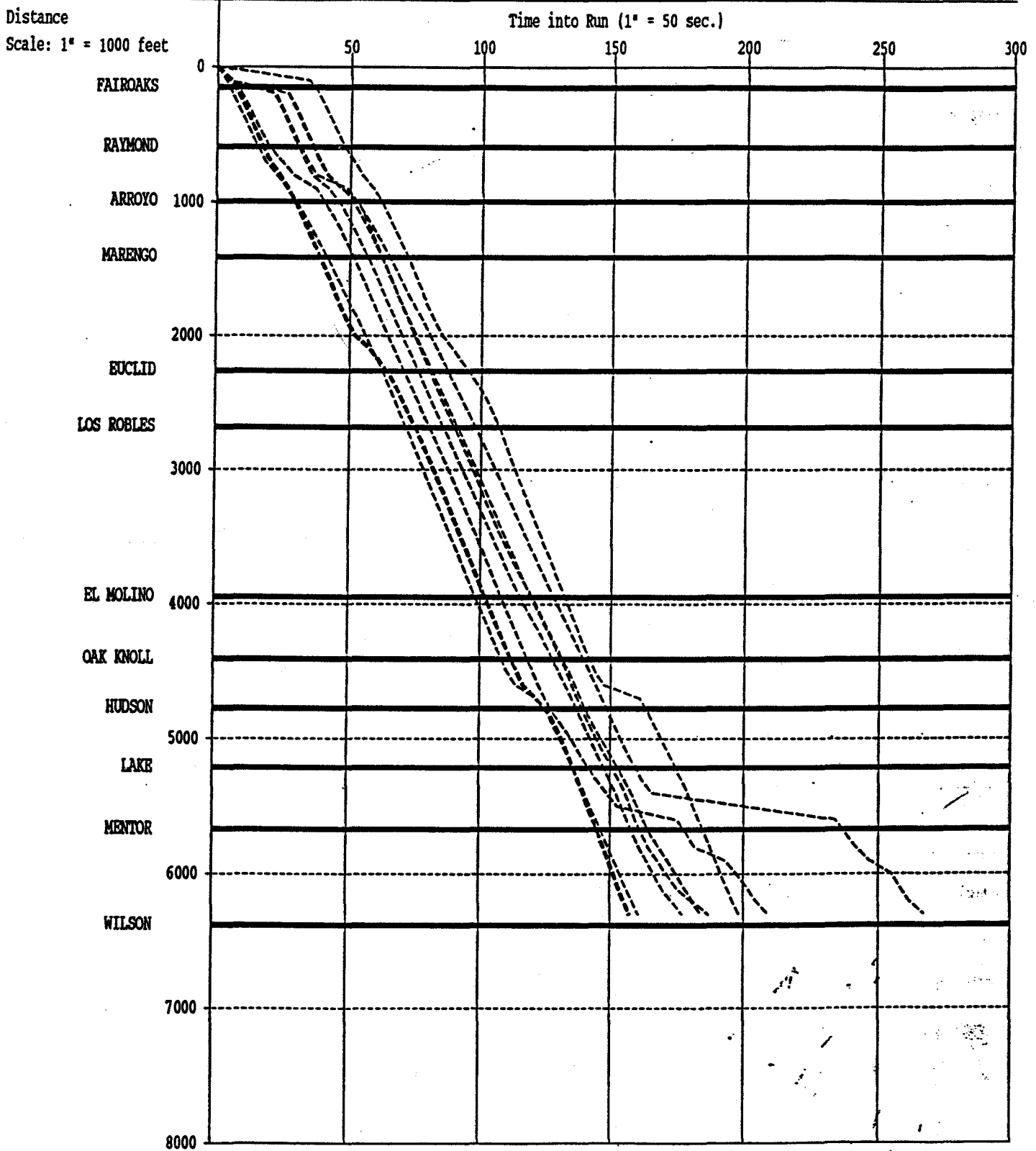
Time/Space Trajectories of All Runs

Solid lines: Before Runs, Dashed lines: After Runs, Thick Line: Primary Run



Time/Space Trajectories of All Runs

Solid lines: Before Runs, Dashed lines: After Runs, Thick Line: Primary Run



PC-Travel, Version 1.5

Summary of Travel Study: BDMAM2.TRV

Date/Time of Report: 02/24/94; 12:11

Speed Profile for Run: 1.

Pulse Data File: BDMEBAM5.PLS

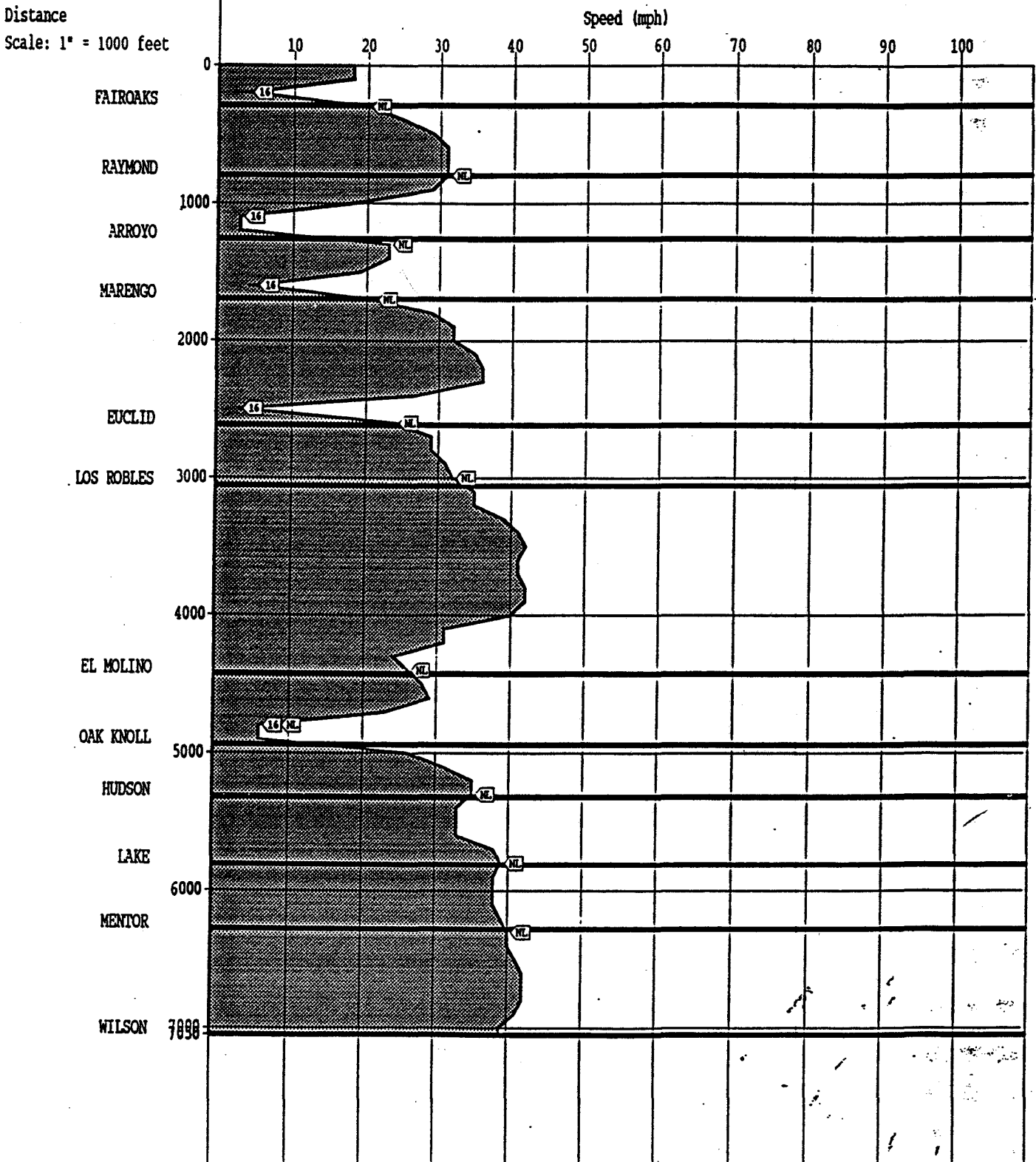
Run Title: DEL MAR AM EASTBOUND

This is a Before Run.

BEFORE STUDY:

DEL MAR BLVD, EASTBOUND

AM PEAK, 5/04/93.



PC-Travel, Version 1.5

Summary of Travel Study: ADMAMEB.TRV

Date/Time of Report: 02/24/94; 17:26

Speed Profile for Run: 3.

Pulse Data File: ADMAM6.PLS

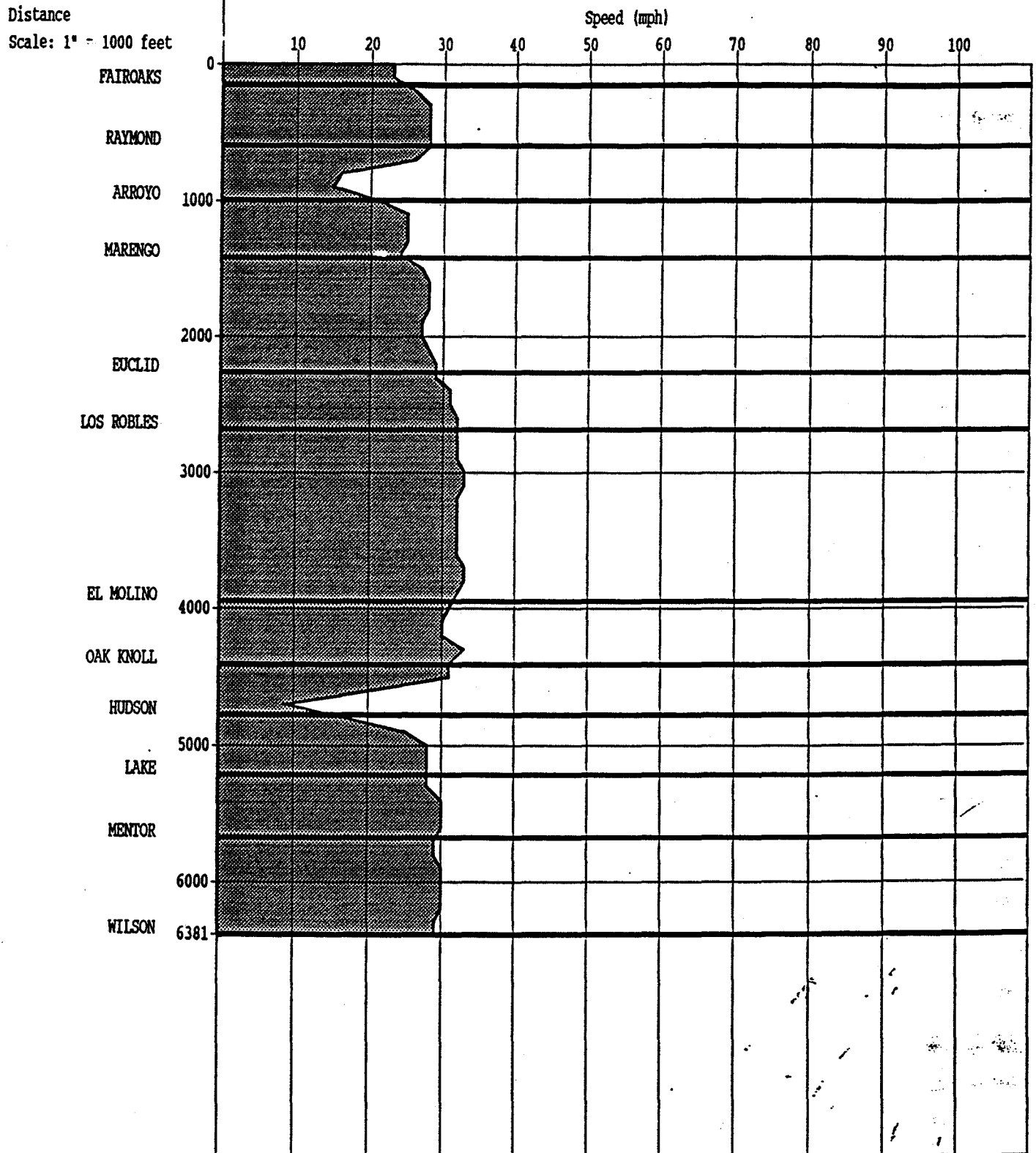
Run Title: ADMAM6

This is an After Run.

AFTER STUDY:

DEL MAR BLVD, EASTBOUND

AM PEAK, 2/24/94.



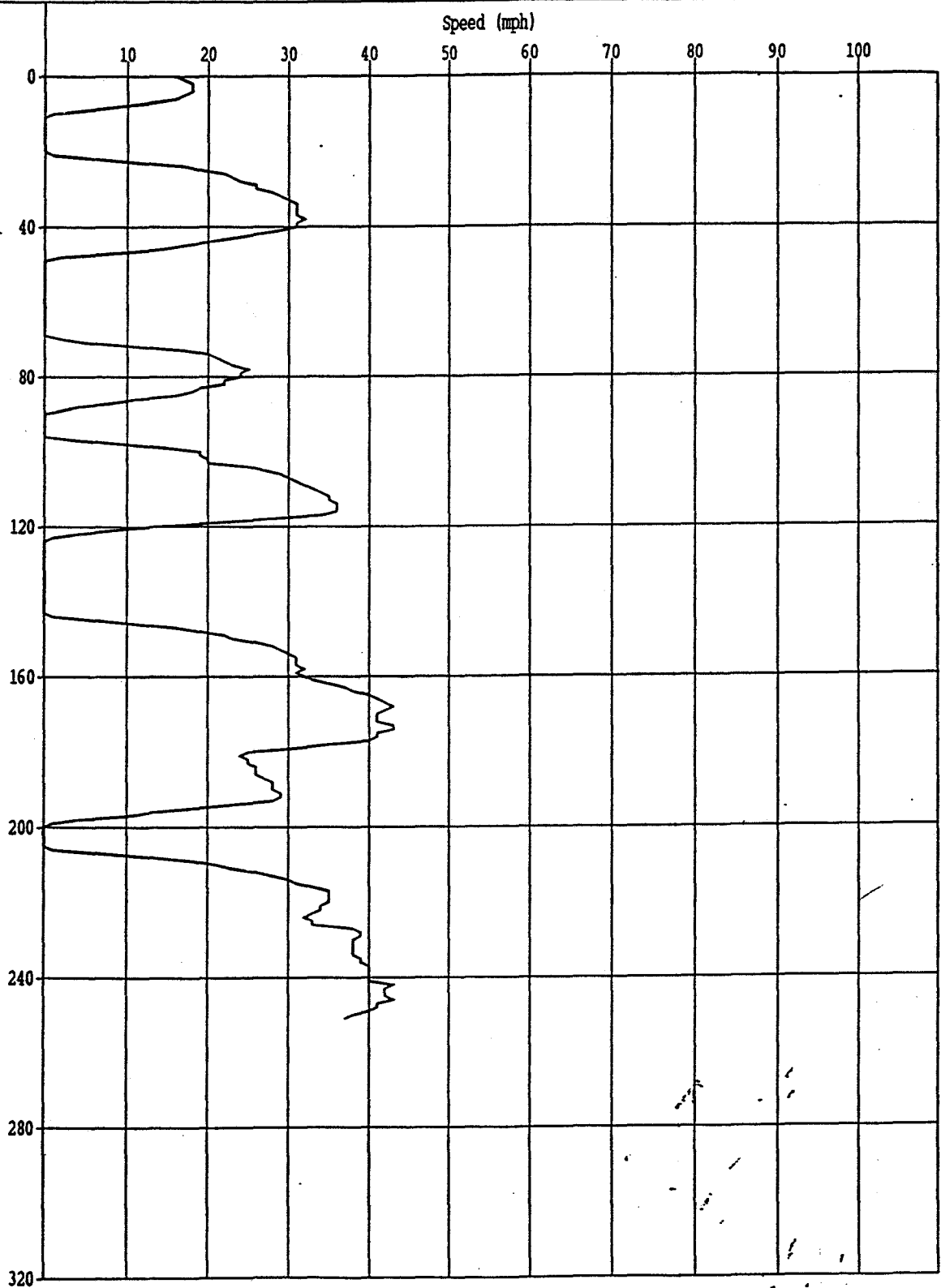
PC-Travel, Version 1.5

Summary of Travel Study: BDMAM2 . TRV
Date/Time of Report: 02/24/94; 12:11
Time-Based Speed Profile for Run: 1.
Run Title: DEL MAR AM EASTBOUND
This is a Before Run.

BEFORE STUDY:
DEL MAR BLVD, EASTBOUND
AM PEAK, 5/04/93.

Pulse Data File: BDMEBAM5 . PLS

Time Into Run
Scale: 1" = 40 sec.



Summary of Travel Study: ADMAMEB.TRV

AFTER STUDY:

DEL MAR BLVD, EASTBOUND

Date/Time of Report: 02/24/94; 17:26

AM PEAK, 2/24/94.

Time-Based Speed Profile for Run: 3.

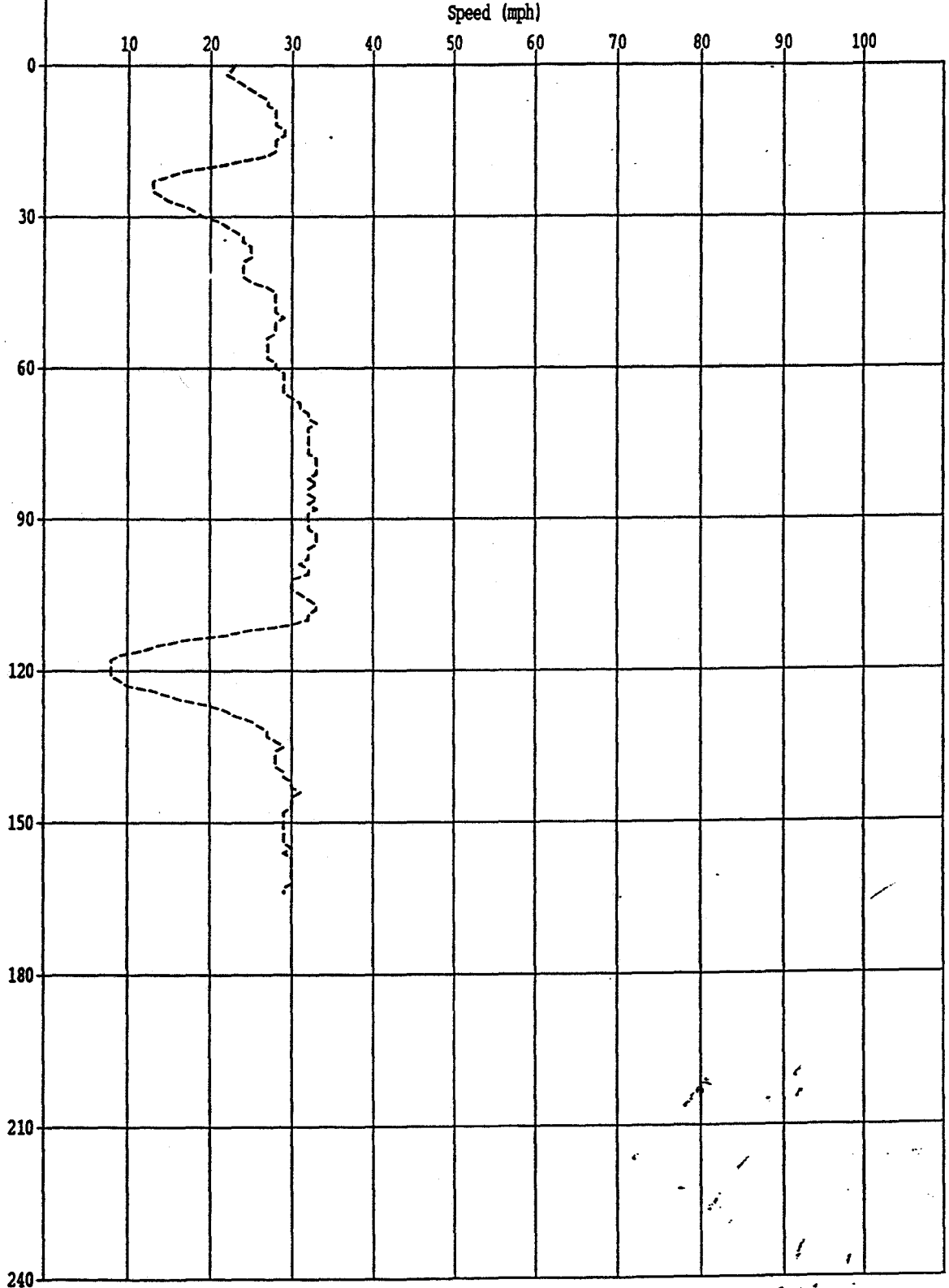
Pulse Data File: ADMAM6.PLS

Run Title: ADMAM6

This is an After Run.

Time Into Run

Scale: 1" = 30 sec.



BEFORE/AFTER STUDIES
FAIR OAKS AVENUE (Holly Street to Bellefontaine Avenue)
Southbound, AM Peak

Overall Output Statistics:

Section			Before Runs						After Runs					
Num	Length	Name	Travel Time	Stops	Speed (mph)	Time Below			Travel Time	Stops	Speed (mph)	Time Below		
						0 mph	10 mph	30 mph				0 mph	10 mph	30 mph
1	139	HOLLY	14.3	0.4	6.6	6.5	9.2	14.3	0.0	0.0	0.0	0.0	0.0	0.0
2	348	UNION	9.2	0.0	25.8	0.0	0.0	8.8	0.0	0.0	0.0	0.0	0.0	0.0
3	360	COLORADO	19.4	0.3	12.7	7.5	9.4	18.7	0.0	0.0	0.0	0.0	0.0	0.0
4	454	GREEN	14.3	0.1	21.6	2.8	3.2	10.5	0.0	0.0	0.0	0.0	0.0	0.0
5	1399	DEL MAR	40.7	0.5	23.4	4.2	7.8	23.0	0.0	0.0	0.0	0.0	0.0	0.0
6	1772	CALIFORNIA	57.5	0.6	21.0	14.0	17.5	32.1	0.0	0.0	0.0	0.0	0.0	0.0
7	1460	BELLEFONTAINE	49.9	0.9	19.9	11.3	15.8	31.9	0.0	0.0	0.0	0.0	0.0	0.0
Overall			205.3	2.8	19.7	46.3	62.9	139.3	0.0	0.0	0.0	0.0	0.0	0.0

Number of Before Runs: 10; Number of After Runs: 0

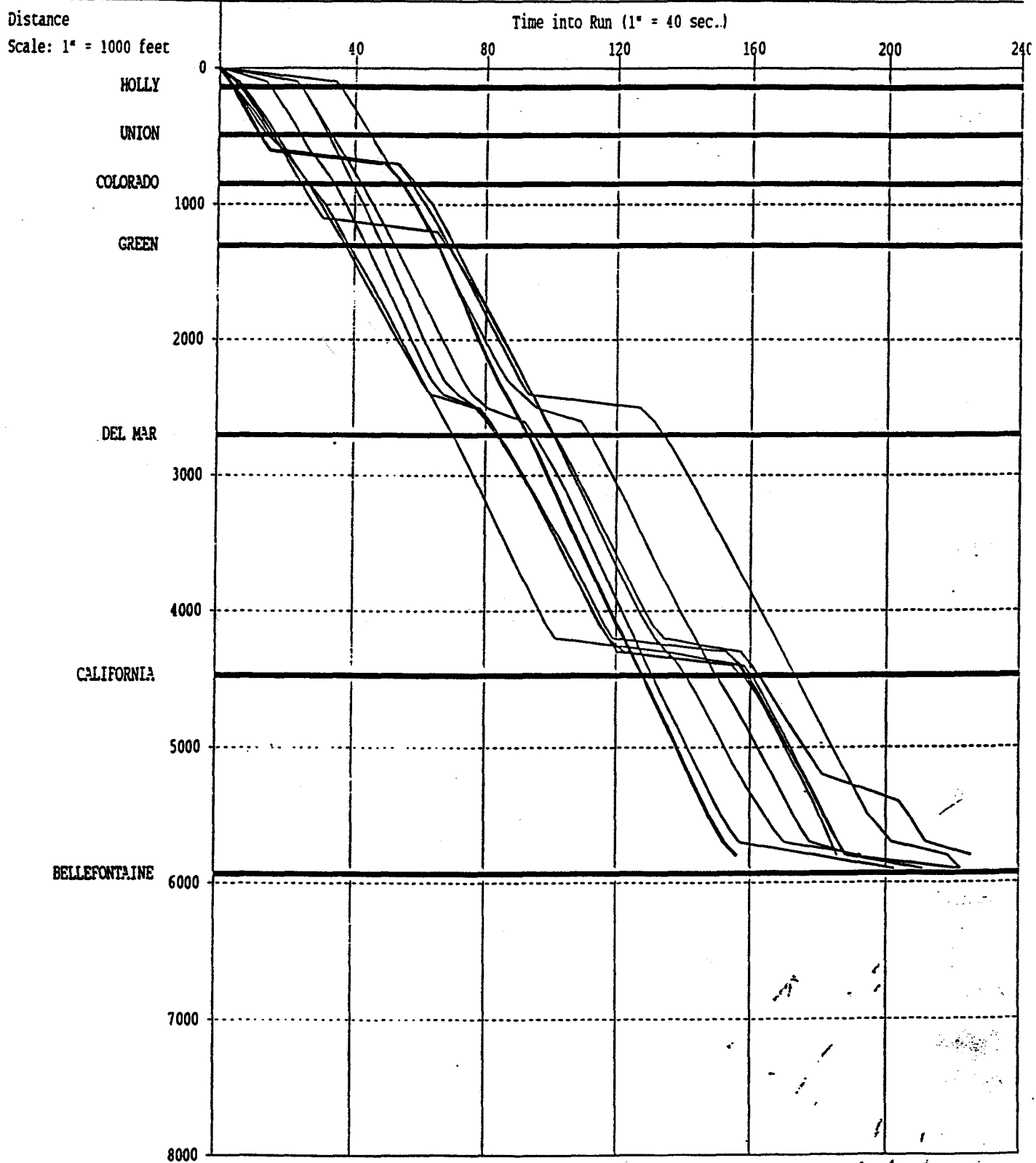
Overall Output Statistics:

Section			Before Runs						After Runs					
Num	Length	Name	Travel Time	Stops	Speed (mph)	Time Below			Travel Time	Stops	Speed (mph)	Time Below		
						0 mph	10 mph	30 mph				0 mph	10 mph	30 mph
1	115	HOLLY	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	18.1	0.0	0.2	4.0
2	284	UNION	0.0	0.0	0.0	0.0	0.0	0.0	13.4	0.2	14.4	4.0	5.1	12.8
3	349	COLORADO	0.0	0.0	0.0	0.0	0.0	0.0	9.7	0.0	24.6	0.0	0.0	9.3
4	440	GREEN	0.0	0.0	0.0	0.0	0.0	0.0	19.6	0.4	15.3	1.8	5.6	19.3
5	1283	DEL MAR	0.0	0.0	0.0	0.0	0.0	0.0	35.4	0.1	24.7	0.0	1.8	27.1
6	1661	CALIFORNIA	0.0	0.0	0.0	0.0	0.0	0.0	37.7	0.0	30.1	0.0	0.0	16.4
7	1314	BELLEFONTAINE	0.0	0.0	0.0	0.0	0.0	0.0	28.2	0.0	31.7	0.0	0.0	6.7
Overall			0.0	0.0	0.0	0.0	0.0	0.0	148.3	0.8	25.0	5.8	12.7	95.7

Number of Before Runs: 0; Number of After Runs: 9

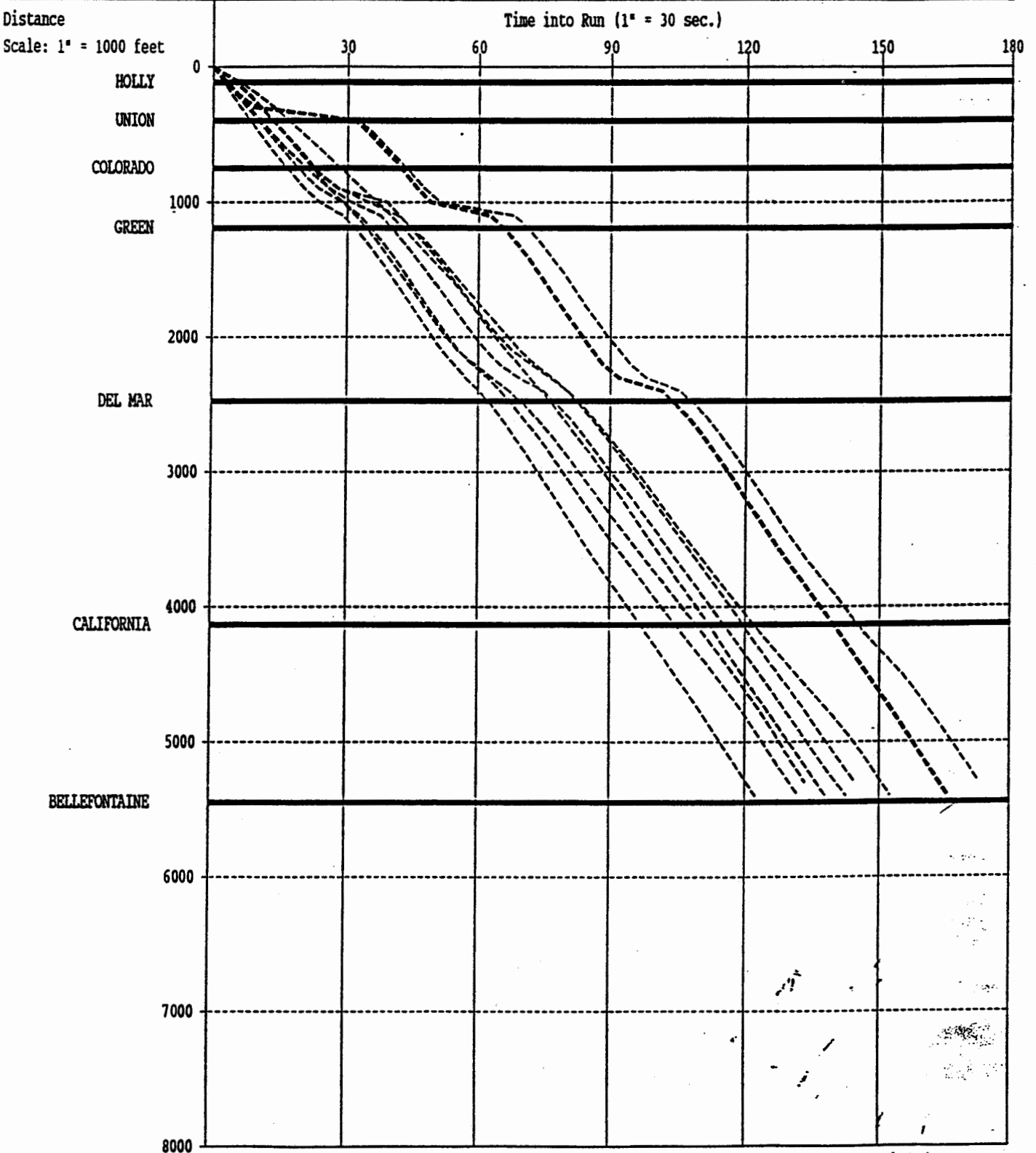
Time/Space Trajectories of All Runs

Solid lines: Before Runs, Dashed lines: After Runs, Thick Line: Primary Run



Time/Space Trajectories of All Runs

Solid lines: Before Runs, Dashed lines: After Runs, Thick Line: Primary Run



Summary of Travel Study: BFOAMSB.TRV

BEFORE STUDY:

FAIR OAKS AVE, SOUTHBOUND
AM PEAK, 5/06/93

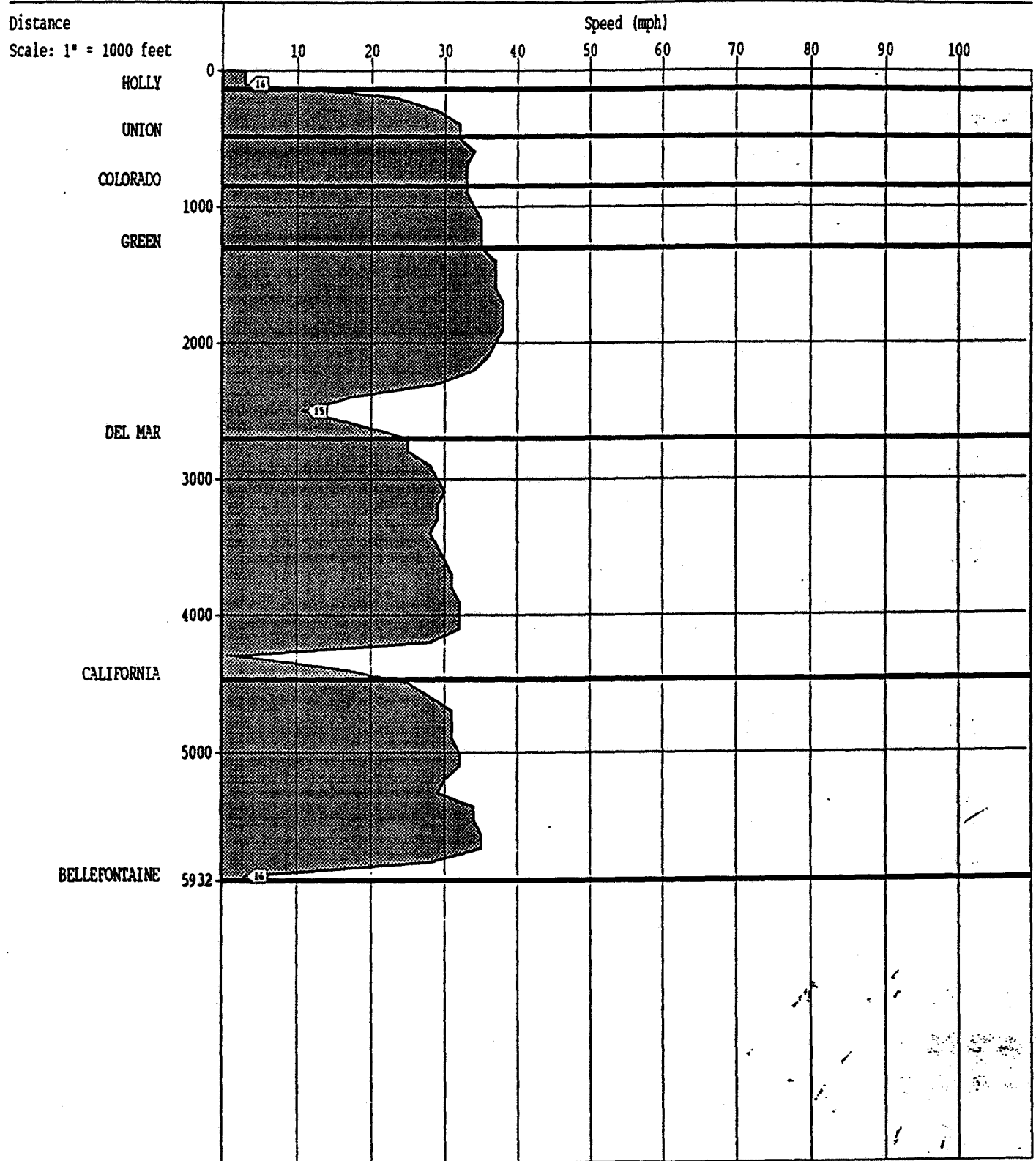
Date/Time of Report: 05/06/93; 10:03

Speed Profile for Run: 5.

Pulse Data File: 709.PLS

Run Title: FAIR OAKS SB/AM

This is a Before Run.



PC-Travel, Version 1.5

Summary of Travel Study: C:\PCTRAVEL\AFOAMSB.TRV

AFTER STUDY:

FAIR OAKS AVE, SOUTHBOUND

Date/Time of Report: 02/16/94; 11:31

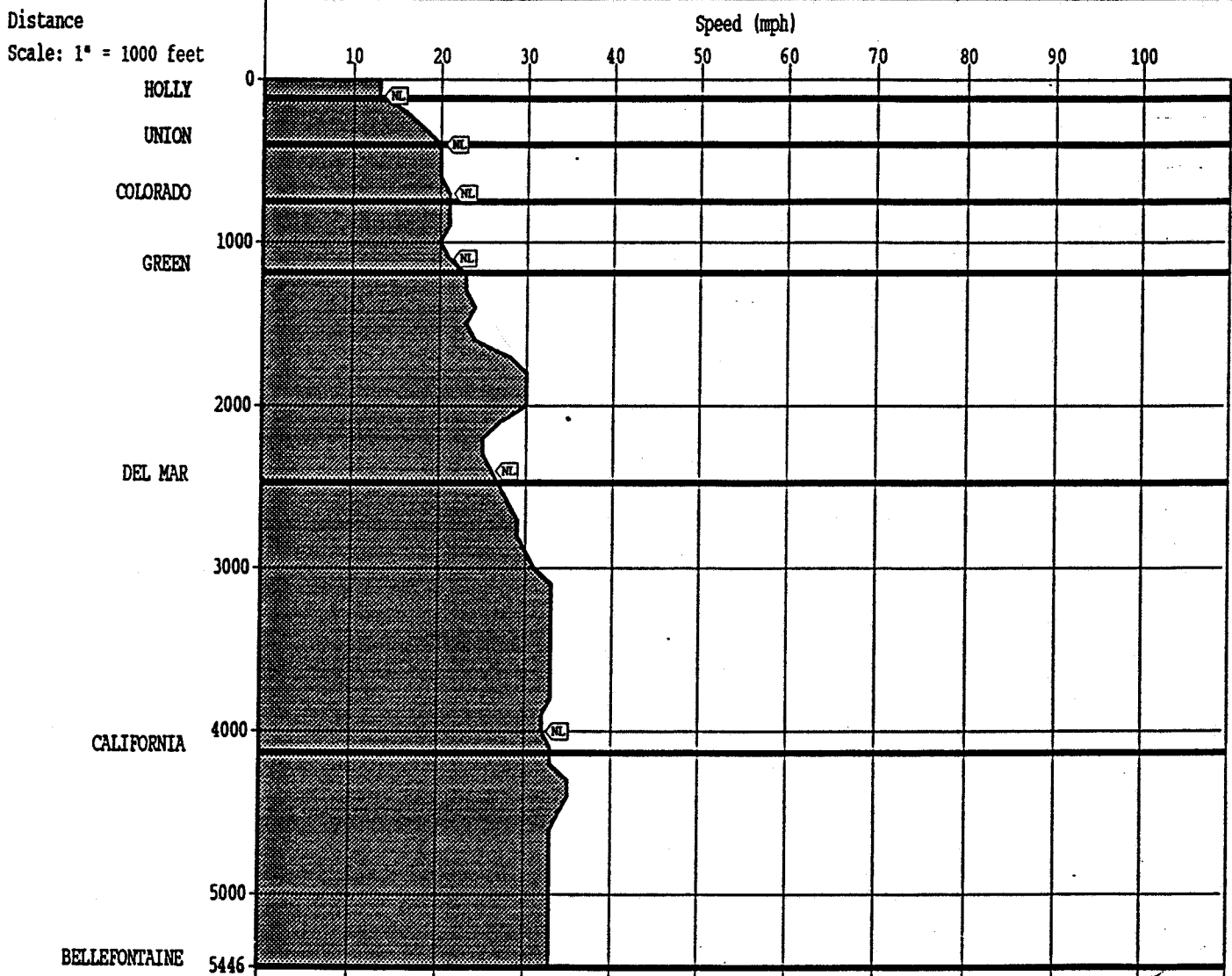
AM PEAK, 2/16/94

Speed Profile for Run: 2.

Pulse Data File: AFOAM5 . PLS

Run Title: AFOAM5

This is an After Run.



Summary of Travel Study: BFOAMSB .TRV

BEFORE STUDY:

FAIR OAKS AVE, SOUTHBOUND

Date/Time of Report: 05/06/93; 10:03

AM PEAK, 5/06/93

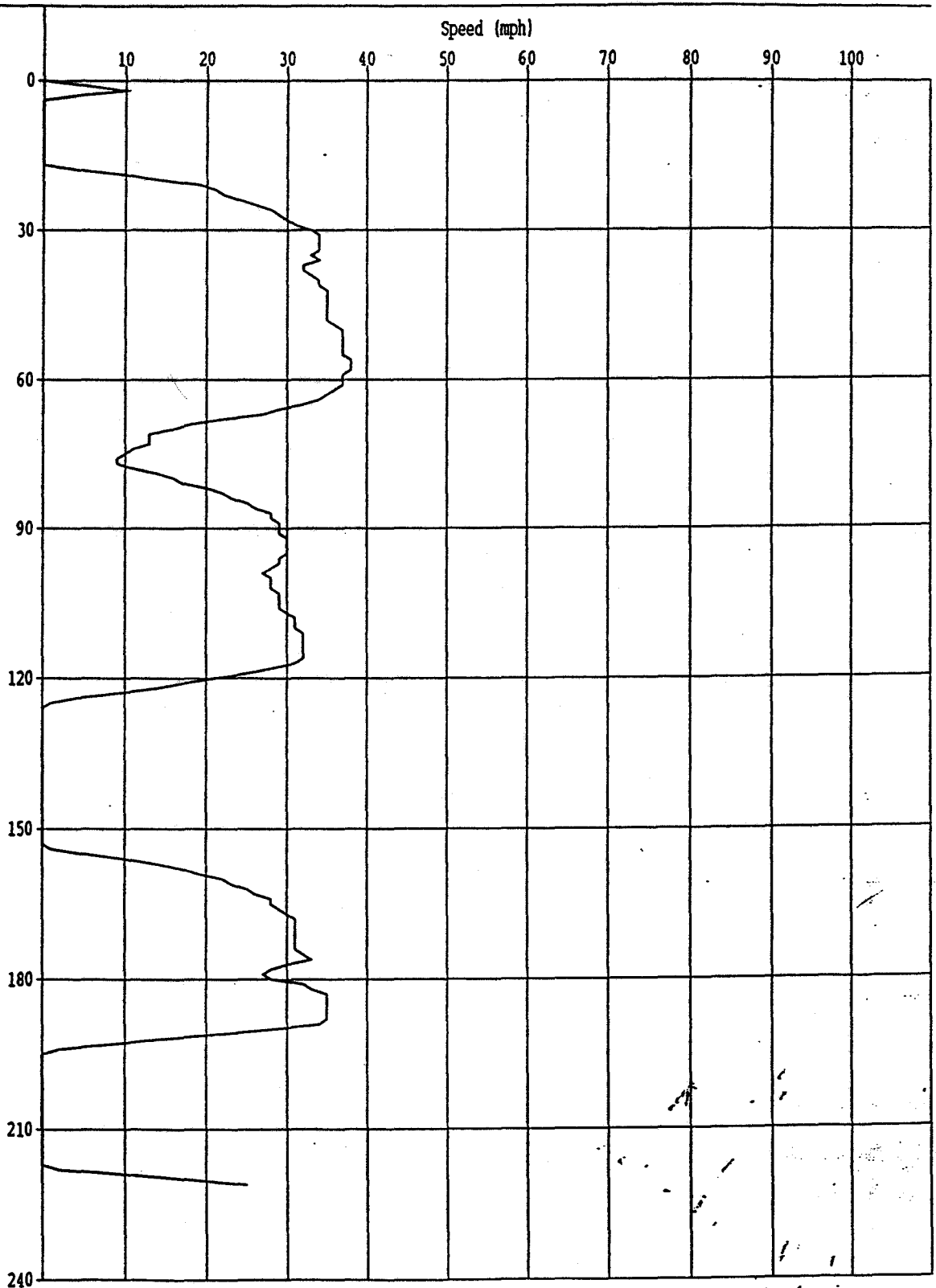
Time-Based Speed Profile for Run: 5.

Pulse Data File: 709 .PLS

Run Title: FAIR OAKS SB/AM

This is a Before Run.

Time Into Run
Scale: 1" = 30 sec.



PC-Travel, Version 1.5

Summary of Travel Study: C:\PCTRAVEL\AFOAMSB.TRV

AFTER STUDY:
FAIR OAKS AVE, SOUTHBOUND
AM PEAK, 2/16/94

Date/Time of Report: 02/16/94; 11:31

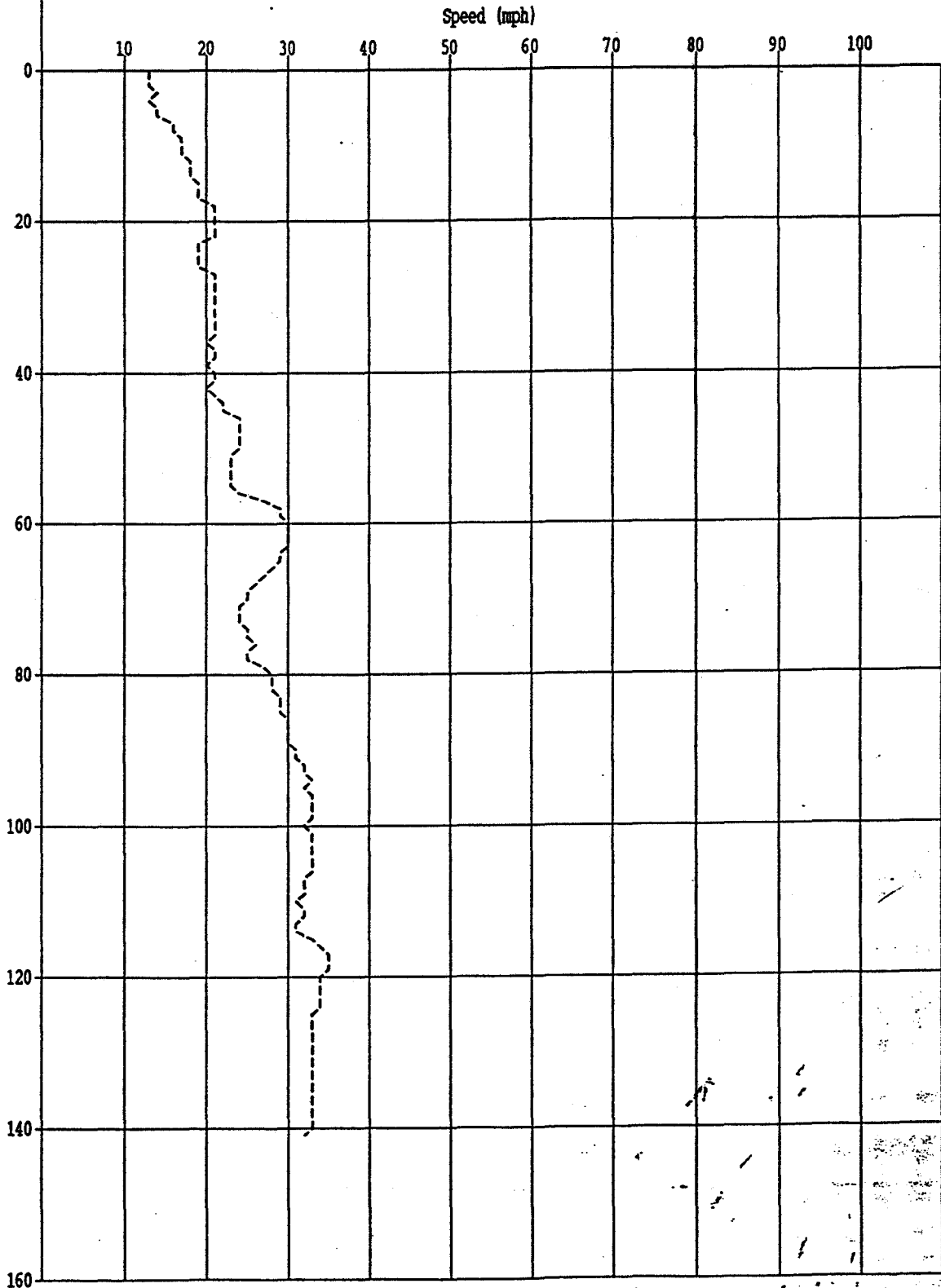
Time-Based Speed Profile for Run: 2.

Pulse Data File: AFOAM5.PLS

Run Title: AFOAM5

This is an After Run.

Time Into Run
Scale: 1" = 20 sec.



BEFORE/AFTER STUDIES
LAKE AVENUE (Union Street to California Boulevard)
Southbound, OFF Peak

PC-Travel, Version 1.5

Summary of Travel Study: BLAKSBOF.TRV

Date/Time of Report: 03/01/94; 15:33

BEFORE STUDY:

LAKE AVE, SOUTHBOUND
OFF PEAK, 5/05/93

Page 2

Overall Output Statistics:

Section			Before Runs						After Runs					
Num	Length	Name	Travel Time	Stops	Speed (mph)	Time Below			Travel Time	Stops	Speed (mph)	Time Below		
						0 mph	10 mph	30 mph				0 mph	10 mph	30 mph
1	177	UNION	16.9	0.7	7.1	7.1	10.6	16.9	0.0	0.0	0.0	0.0	0.0	0.0
2	699	COLORADO	33.2	0.8	14.3	6.2	12.0	32.9	0.0	0.0	0.0	0.0	0.0	0.0
3	455	GREEN	19.1	0.2	16.2	4.4	6.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0
4	772	CORDOVA	22.3	0.0	23.6	0.0	0.7	19.9	0.0	0.0	0.0	0.0	0.0	0.0
5	656	DELMAR	34.4	0.9	13.0	7.9	14.7	34.1	0.0	0.0	0.0	0.0	0.0	0.0
6	546	BULLOCKS X-WALK	21.4	0.4	17.4	2.3	5.6	21.4	0.0	0.0	0.0	0.0	0.0	0.0
7	458	SAN PASQUAL	15.6	0.1	20.1	2.0	2.6	15.1	0.0	0.0	0.0	0.0	0.0	0.0
8	691	CALIFORNIA	47.8	1.2	9.9	16.3	25.4	47.8	0.0	0.0	0.0	0.0	0.0	0.0
Overall			210.8	4.3	14.4	46.3	77.4	206.1	0.0	0.0	0.0	0.0	0.0	0.0

Number of Before Runs: 9; Number of After Runs: 0

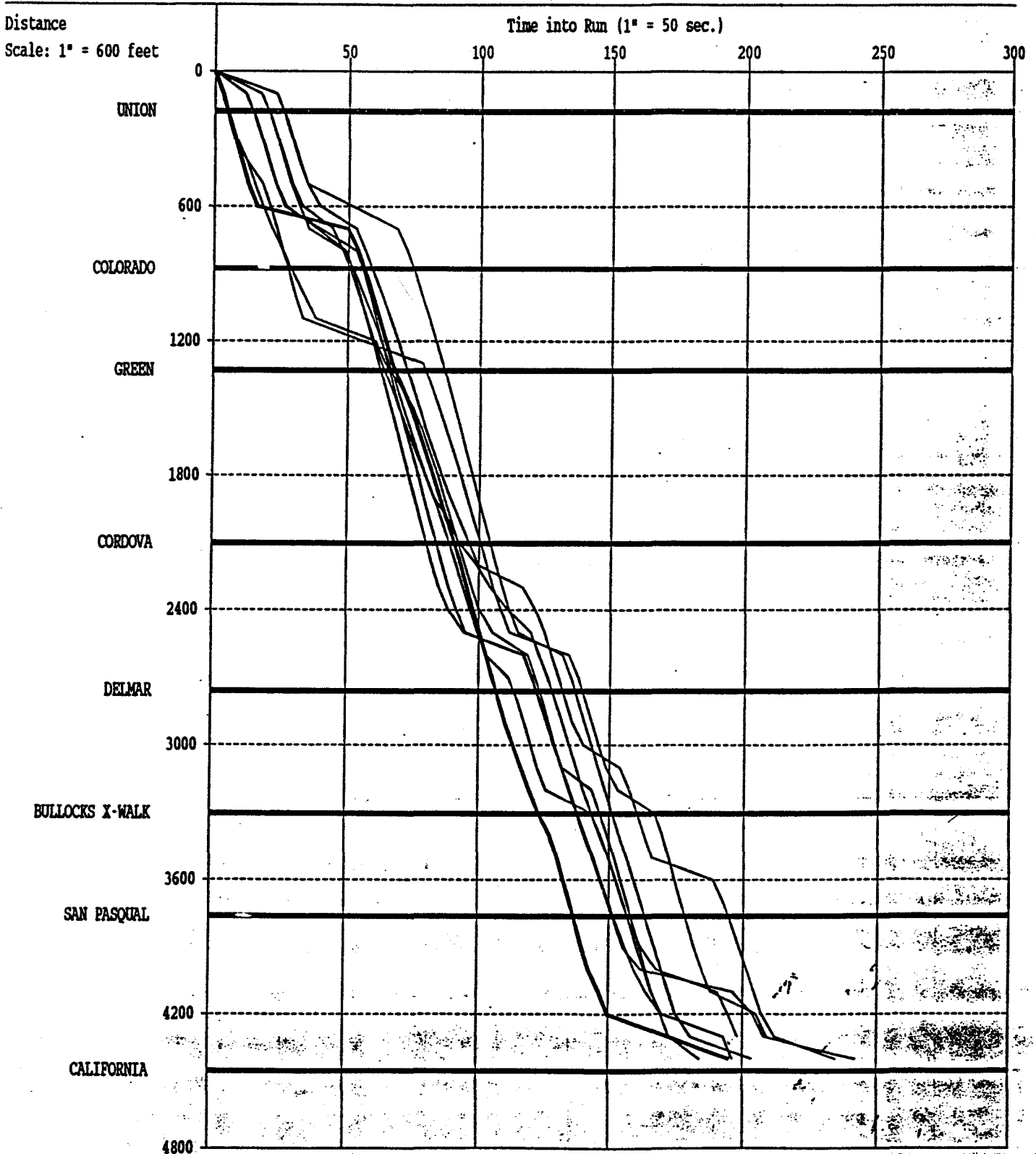
Overall Output Statistics:

Section			Before Runs						After Runs					
Num	Length	Name	Travel Time	Stops	Speed (mph)	Time Below			Travel Time	Stops	Speed (mph)	Time Below		
						0 mph	10 mph	30 mph				0 mph	10 mph	30 mph
1	119	UNION	0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.6	7.3	3.0	6.8	11.1
2	655	COLORADO	0.0	0.0	0.0	0.0	0.0	0.0	17.7	0.1	25.2	0.4	1.0	13.9
3	446	GREEN	0.0	0.0	0.0	0.0	0.0	0.0	21.8	0.8	13.9	0.2	8.2	21.8
4	660	CORDOVA	0.0	0.0	0.0	0.0	0.0	0.0	20.3	0.1	22.2	1.3	2.6	17.7
5	625	DELMAR	0.0	0.0	0.0	0.0	0.0	0.0	19.7	0.2	21.6	0.7	2.0	18.6
6	565	BULLOCKS X-WALK	0.0	0.0	0.0	0.0	0.0	0.0	16.6	0.1	23.2	1.8	2.3	14.4
7	414	SAN PASQUAL	0.0	0.0	0.0	0.0	0.0	0.0	15.3	0.1	18.4	0.5	2.8	15.3
8	577	CALIFORNIA	0.0	0.0	0.0	0.0	0.0	0.0	23.5	0.4	16.7	4.0	7.4	22.3
Overall			0.0	0.0	0.0	0.0	0.0	0.0	146.0	2.4	19.0	11.9	33.1	135.1

Number of Before Runs: 0; Number of After Runs: 10

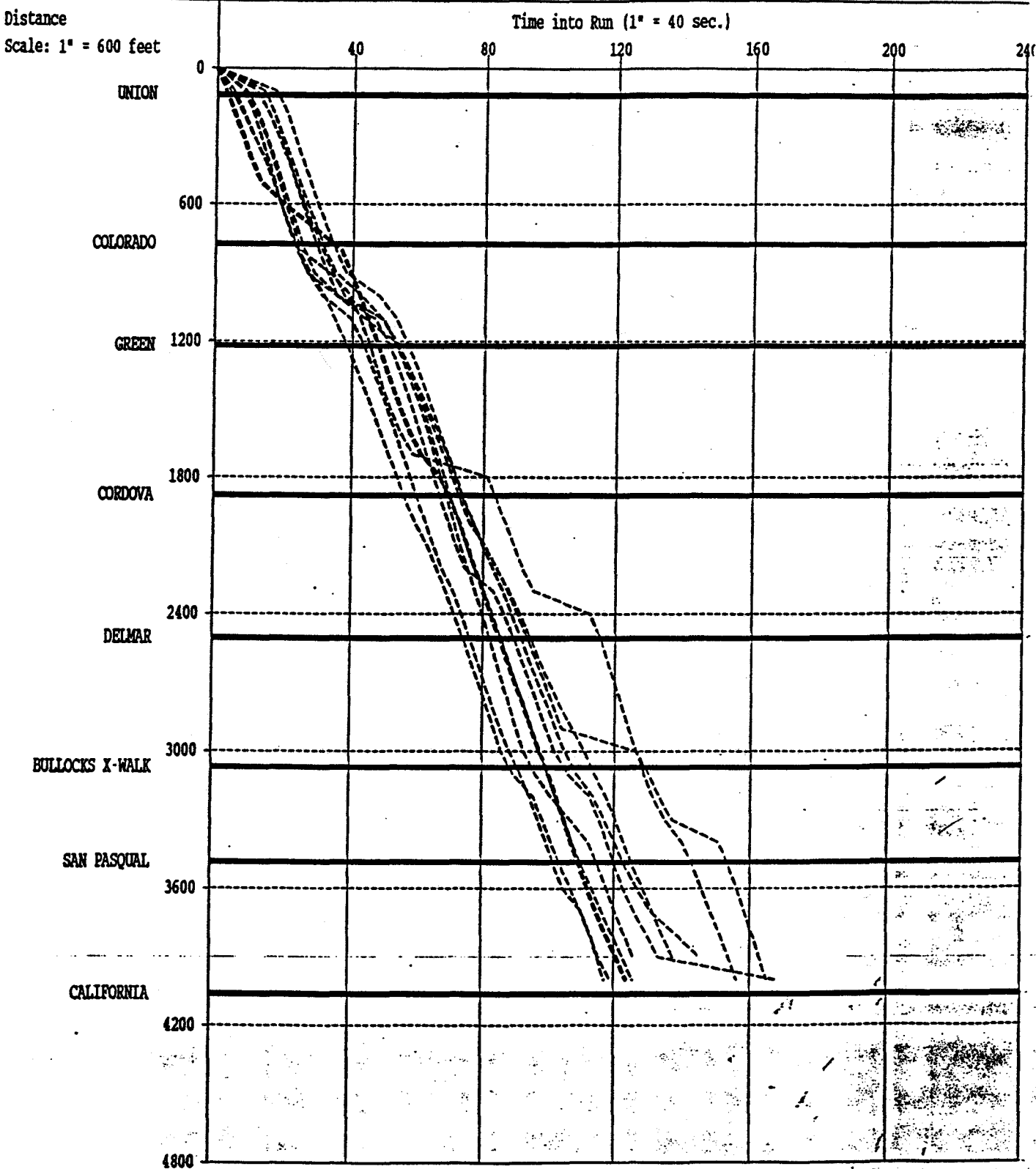
Time/Space Trajectories of All Runs

Solid lines: Before Runs, Dashed lines: After Runs, Thick Line: Primary Run



Time/Space Trajectories of All Runs

Solid lines: Before Runs, Dashed lines: After Runs, Thick Line: Primary Run



PC-Travel, Version 1.5

Summary of Travel Study: BLAKSBOF.TRV

Date/Time of Report: 03/01/94; 15:33

Speed Profile for Run: 7.

Pulse Data File: 524.PLS

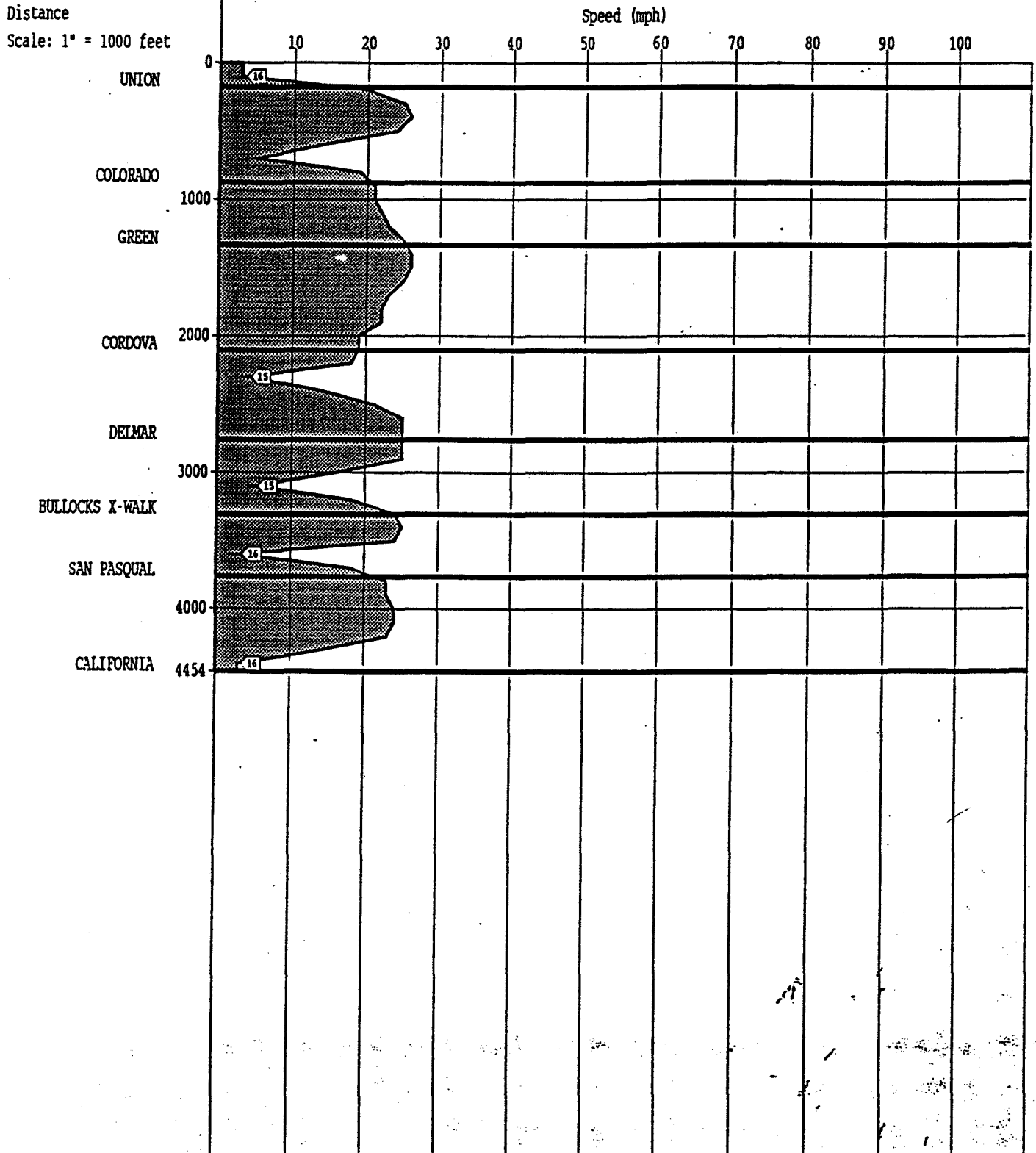
Run Title: LAKE SB/OFF

This is a Before Run.

BEFORE STUDY:

LAKE AVE, SOUTHBOUND

OFF PEAK, 5/05/93



Summary of Travel Study: ALAOF SB .TRV

AFTER STUDY:

LAKE AVE, SOUTHBOUND

Date/Time of Report: 03/01/94; 15:19

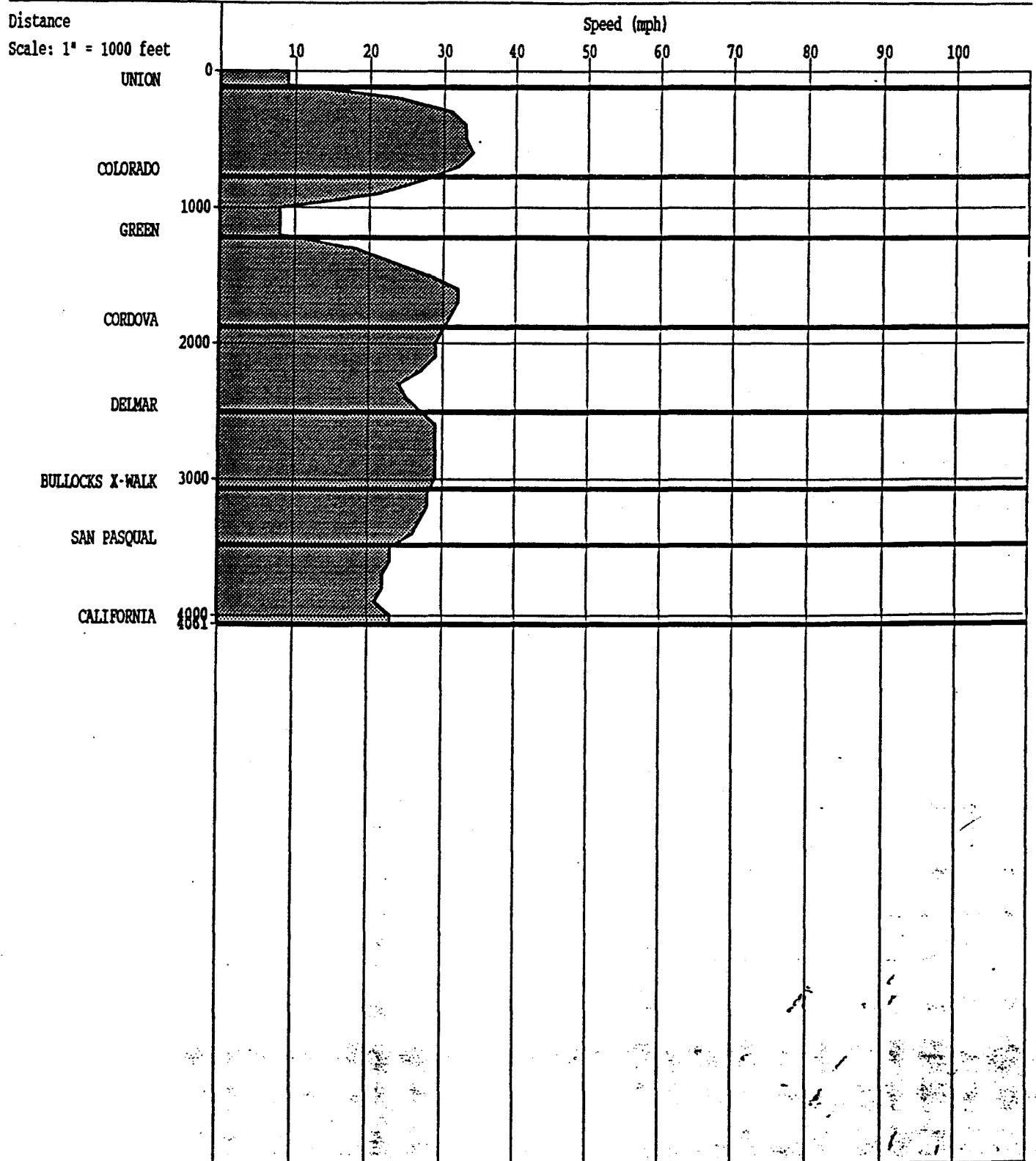
OFF PEAK, 2/22/94

Speed Profile for Run: 5.

Pulse Data File: ALAOF10 .PLS

Run Title: ALAOF10

This is an After Run.



PC-Travel, Version 1.5

Summary of Travel Study: BLAKSBOF.TRV

Date/Time of Report: 03/01/94; 15:33

Time-Based Speed Profile for Run: 7.

Run Title: LAKE SB/OFF

This is a Before Run.

BEFORE STUDY:

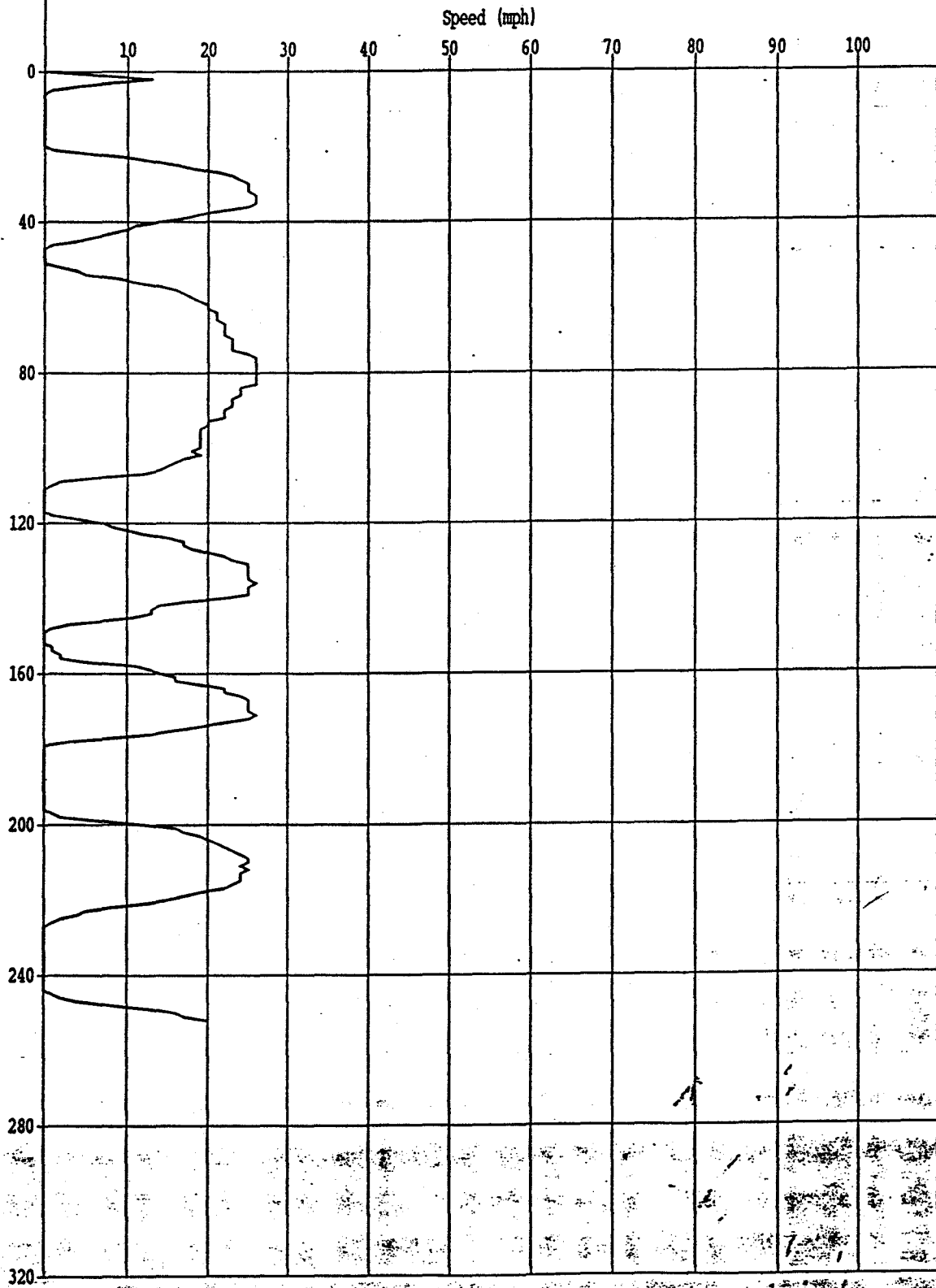
LAKE AVE, SOUTHBOUND

OFF PEAK, 5/05/93

Pulse Data File: 524.PLS

Time Into Run

Scale: 1" = 40 sec.



PC-Travel, Version 1.5

Summary of Travel Study: ALAOF5B.TRV

Date/Time of Report: 03/01/94; 15:19

Time-Based Speed Profile for Run: 5.

Run Title: ALAOF10

This is an After Run.

AFTER STUDY:

LAKE AVE, SOUTHBOUND
OFF PEAK, 2/22/94

Pulse Data File: ALAOF10.PLS

Time Into Run

Scale: 1" = 20 sec.

