



Los Angeles County
Metropolitan Transportation Authority

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Metro

AUGUST 27, 2020

TO: BOARD OF DIRECTORS

THROUGH: PHILLIP A. WASHINGTON *PAW*
CHIEF EXECUTIVE OFFICER

FROM: JAMES T. GALLAGHER *JTG*
CHIEF OPERATIONS OFFICER

SUBJECT: AUTOMATIC CROSSING GATES SUMMARY OF FINDINGS - L
AND E LINES

ISSUE

In February 2020, a board report was provided in response to Motion 47 requesting for information on Metro's light rail gate down times for at-grade crossings. In March 2020, a board box was provided in response to Metro Board Directors Fasana and Bonin's requests for additional information regarding specific grade crossings. In August 2020, a 2nd board report was provided to the board along with a presentation. This final board box is meant to summarize all reports and address concerns raised by the Operations, Safety and Customer Experience Committee members specific to the L (Gold) and E (Expo) Lines.

BACKGROUND

Metro's light rail system has a total of 75 grade crossings as follows:

- A Line (Blue) - 27
- E Line (Expo) - 15
- L Line (Gold) – 33

Specifically, there are 48 highway grade crossings located on the E and L Lines, 15 and 33 respectively.

DISCUSSION

Staff performed an analysis of all grade crossings utilizing supervisory control and data acquisition system (SCADA) information for a six-month period, May 1, 2019 through October 31, 2019.

- Primary reasons for gate downtimes exceeding 3 minutes include:
 - Equipment failure, broken gate arms
 - Multiple trains approaching grade crossing concurrently

- Trains entering/leaving rail yards to the crossing
- Close proximity to stations

After discussion with board members, a request to perform a deeper analysis of the L (Gold) and E (Expo) Lines was completed to understand issues, hot spots, or areas where additional efforts and/or coordination to reduce downtimes was necessary. Please see attachments A and B for details.

L (Gold) Line Grade Crossing Analysis & Actions

For the L (Gold) Line, the following grade crossings were found to have slightly higher downtime instances within 3 to 5 minutes: Mountain, Myrtle and Ave. 45.

Actions to Date

- Mountain Grade Crossing - Eliminated routine use of operator relief platform – emergency only. Implemented change Dec 2019.
- S. Myrtle Grade Crossing - Train Operators improved use of the Train-to-Wayside (TWC) control system to cancel gate activation during long dwell times at Monrovia Station. Implemented change Dec 2019
- Ave 45 Grade Crossing - Lift current speed restriction for northbound trains through crossing to reduce gate down times. Engineering analysis and testing completed. To be implemented September 2020.
- Caltrans Traffic Controller Upgrade Project - Metro will continue to work with our partners at Caltrans and LA County to upgrade traffic signals system firmware, timing and controllers via the I-210 Fwy Corridor Project. This work will prioritize traffic signals at Duarte Rd/Myrtle Ave and Duarte Rd/Mountain intersections to ultimately help reduce downtime instances on the L Line. The target completion date is September 30, 2020.

E (Expo) Line Grade Crossing Analysis & Actions

For the E (EXPO) line, the following grade crossings were also found to have slightly higher downtime instances within 3 to 5 minutes: 26th St., Stewart St., and 20th St.

Actions to Date

- 26th St. Grade Crossing – Reviewed proximity to 26th Station and yard. Train Operators to consistently use TWC control system to cancel gate activation during long dwell times. Change schedule for northbound yard pull-ins to avoid train bunching.
- Stewart St. Grade Crossing – Reviewed crossing within the yard limits. Implemented a temporary slow order in place while track bed is being improved. Allow northbound yard pull-ins and gate activation only when the route into the yard is clear. Temporary modification to gate activation circuits will be done to match current restricted speed.
- 20th St. Grade Crossing - Changed schedule for northbound yard pull-ins to avoid train bunching.

NEXT STEPS

- Trains entering/leaving rail yards to the crossing
- Close proximity to stations

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L (Gold) Line Grade Crossing Analysis & Actions

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- 20th St. Grade Crossing - Changed schedule for northbound yard pull-ins to avoid train bunching.

NEXT STEPS

Staff will continue to pull and monitor data relative to gate downtimes for grade crossings across all light rail lines. Staff will also continue to coordinate with our board members, cities and partner agencies to resolve issues that arise in a responsive and timely manner so that Metro can continue to deliver service that is safe and reliable.

ATTACHMENTS_

A - Gate Down Times for All Grade Crossings – L and E Lines

B - Summary Presentation

L (Gold) Line

Data Range January 1, 2020 - June 30, 2020

SANTA CLARA CROSSING

Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	32822	99.74%
3:00 to 4:59	63	0.19%
5:00 to 9:59	20	0.06%
10:00 or more	4	0.01%
Total Instances	32909	

GOLD LINE GRADE CROSSING DOWNTIMES

Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	1033943	99.74%
3:00 to 4:59	1976	0.19%
5:00 to 9:59	543	0.05%
10:00 or more	154	0.01%
Total Instances	1036616	

DALTON CROSSING

Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	37347	99.85%
3:00 to 4:59	37	0.10%
5:00 to 9:59	15	0.04%
10:00 or more	4	0.01%
Total Instances	37403	

PASADENA CROSSING

Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	35661	99.47%
3:00 to 4:59	161	0.45%
5:00 to 9:59	20	0.06%
10:00 or more	9	0.03%
Total Instances	35851	

AZUSA CROSSING

Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	33681	99.59%
3:00 to 4:59	128	0.38%
5:00 to 9:59	7	0.02%
10:00 or more	4	0.01%
Total Instances	33820	

HIGHLAND CROSSING

Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	37216	99.94%
3:00 to 4:59	15	0.04%
5:00 to 9:59	6	0.02%
10:00 or more	2	0.01%
Total Instances	37239	

SAN GABRIEL CROSSING

Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	36132	99.94%
3:00 to 4:59	16	0.04%
5:00 to 9:59	1	0.00%
10:00 or more	3	0.01%
Total Instances	36152	

VIRGINIA CROSSING

Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	34887	99.95%
3:00 to 4:59	11	0.03%
5:00 to 9:59	4	0.01%
10:00 or more	2	0.01%
Total Instances	34904	

BUENA VISTA CROSSING

Downtime (minutes)	# of instances	% of Total
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0:00 to 2:59	33452	99.77%
3:00 to 4:59	58	0.17%
5:00 to 9:59	14	0.04%
10:00 or more	4	0.01%
Total Instances	33528	

MOUNTAIN CROSSING

Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	33791	99.80%
3:00 to 4:59	58	0.17%
5:00 to 9:59	7	0.02%
10:00 or more	4	0.01%
Total Instances	33860	

CALIFORNIA CROSSING

Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	32126	99.79%
3:00 to 4:59	54	0.17%
5:00 to 9:59	10	0.03%
10:00 or more	4	0.01%
Total Instances	32194	

MAGNOLIA CROSSING

Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	34648	99.84%
3:00 to 4:59	45	0.13%
5:00 to 9:59	10	0.03%
10:00 or more	2	0.01%
Total Instances	34705	

MAYFLOWER CROSSING

Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	34422	99.93%
3:00 to 4:59	11	0.03%
5:00 to 9:59	9	0.03%
10:00 or more	3	0.01%
Total Instances	34445	

S. MYRTLE CROSSING

Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	31765	99.68%
3:00 to 4:59	75	0.24%
5:00 to 9:59	19	0.06%
10:00 or more	9	0.03%
Total Instances	31868	

ARROYO VERDIE CROSSING

Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	30643	99.94%
3:00 to 4:59	6	0.02%
5:00 to 9:59	8	0.03%
10:00 or more	3	0.01%
Total Instances	30660	

AVE 33 CROSSING

Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	31139	99.89%
3:00 to 4:59	26	0.08%
5:00 to 9:59	8	0.03%
10:00 or more	1	0.00%
Total Instances	31174	

AVE 45 CROSSING		
Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	28217	98.80%
3:00 to 4:59	279	0.98%
5:00 to 9:59	47	0.16%
10:00 or more	18	0.06%
Total Instances	28561	

AVE 50 CROSSING		
Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	28488	99.78%
3:00 to 4:59	51	0.18%
5:00 to 9:59	8	0.03%
10:00 or more	4	0.01%
Total Instances	28551	

AVE 59 CROSSING		
Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	29935	99.86%
3:00 to 4:59	26	0.09%
5:00 to 9:59	13	0.04%
10:00 or more	3	0.01%
Total Instances	29977	

AVE 60 CROSSING		
Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	31656	99.85%
3:00 to 4:59	33	0.10%
5:00 to 9:59	13	0.04%
10:00 or more	3	0.01%
Total Instances	31705	

AVE 61 CROSSING		
Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	26813	99.54%
3:00 to 4:59	97	0.36%
5:00 to 9:59	20	0.07%
10:00 or more	6	0.02%
Total Instances	26936	

CALIFORNIA CROSSING		
Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	27891	99.66%
3:00 to 4:59	60	0.21%
5:00 to 9:59	29	0.10%
10:00 or more	5	0.02%
Total Instances	27985	

DEL MAR CROSSING		
Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	26697	99.70%
3:00 to 4:59	64	0.24%
5:00 to 9:59	11	0.04%
10:00 or more	5	0.02%
Total Instances	26777	

EL CENTRO CROSSING		
Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	32510	99.79%
3:00 to 4:59	45	0.14%

5:00 to 9:59	18	0.06%
10:00 or more	6	0.02%
Total Instances	32579	

FIGUEROA CROSSING		
Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	26948	99.54%
3:00 to 4:59	98	0.36%
5:00 to 9:59	20	0.07%
10:00 or more	6	0.02%
Total Instances	27072	

FREMONT CROSSING		
Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	31074	99.84%
3:00 to 4:59	23	0.07%
5:00 to 9:59	23	0.07%
10:00 or more	3	0.01%
Total Instances	31123	

FRENCH CROSSING		
Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	28762	99.85%
3:00 to 4:59	37	0.13%
5:00 to 9:59	4	0.01%
10:00 or more	1	0.00%
Total Instances	28804	

GLENARM ST CROSSING		
Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	27812	99.80%
3:00 to 4:59	50	0.18%
5:00 to 9:59	4	0.01%
10:00 or more	3	0.01%
Total Instances	27869	

HOPE ST CROSSING		
Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	30140	99.89%
3:00 to 4:59	18	0.06%
5:00 to 9:59	13	0.04%
10:00 or more	3	0.01%
Total Instances	30174	

INDIANA CROSSING		
Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	30019	99.91%
3:00 to 4:59	14	0.05%
5:00 to 9:59	8	0.03%
10:00 or more	6	0.02%
Total Instances	30047	

MISSION CROSSING		
Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	30604	99.63%
3:00 to 4:59	80	0.26%
5:00 to 9:59	27	0.09%
10:00 or more	6	0.02%
Total Instances	30717	

ORANGE GROVE CROSSING		
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Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	28378	99.47%
3:00 to 4:59	74	0.26%
5:00 to 9:59	69	0.24%
10:00 or more	9	0.03%
Total Instances	28530	

PASADENA WEST CROSSING		
Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	27840	99.26%
3:00 to 4:59	147	0.52%
5:00 to 9:59	54	0.19%
10:00 or more	7	0.02%
Total Instances	28048	

STATE ST PED CROSSING		
Downtime (minutes)	# of instances	% of Total
0:00 to 2:59	30427	99.93%
3:00 to 4:59	16	0.05%
5:00 to 9:59	4	0.01%
10:00 or more	2	0.01%
Total Instances	30449	

Motion 47
Automatic Crossing Gates
Supplemental Information

Motion 47 Response - Overview

- Metro's Light Rail system has 48 highway grade crossings located on the L and E Lines, 33 and 15 respectively
- Primary reasons for gate downtimes exceeding 3 minutes include:
 - Equipment failure, broken gate arms
 - Multiple trains approaching grade crossing concurrently
 - Trains entering/leaving rail yards to the crossing
 - Close proximity to stations
- Deep Dive focused on most significant gate time instances within 3 to 5 minutes
 - L Line had three grade crossings – Mountain, Myrtle and Ave. 45
 - E Line had three grade crossings – 26th St., Stewart St., and 20th St.

L Line Grade Crossing Downtime Actions

Mountain Grade Crossing					
	May-October 2019		January- June 2020		Comparison
Downtime (minutes)	# of Instances	% of Total	# of instances	% of Total	
0:00 to 2:59	38950	98.94%	33791	99.80%	Better
3:00 to 4:59	403	1.02%	58	0.17%	Better
5:00 to 9:59	12	0.03%	7	0.02%	Better
10:00 or more	3	0.01%	4	0.01%	Similar
Total Instances	39368		33860		
S. Myrtle Grade Crossing					
	May-October 2019		January- June 2020		Comparison
Downtime (minutes)	# of Instances	% of Total	# of instances	% of Total	
0:00 to 2:59	35066	98.83%	31765	99.68%	Better
3:00 to 4:59	354	1.00%	75	0.24%	Better
5:00 to 9:59	54	0.15%	19	0.06%	Better
10:00 or more	8	0.02%	9	0.03%	Similar
Total Instances	35482		31868		
Ave 45 Grade Crossing					
	May-October 2019		January- June 2020		Comparison
Downtime (minutes)	# of Instances	% of Total	# of instances	% of Total	
0:00 to 2:59	36265	98.55%	28217	98.80%	Similar
3:00 to 4:59	486	1.32%	279	0.98%	Similar
5:00 to 9:59	40	0.11%	47	0.16%	Worst
10:00 or more	8	0.02%	18	0.06%	Worst
Total Instances	36799		28561		

Mountain Grade Crossing

- Eliminated routine use of operator relief platform – emergency only
- Implemented change Dec 2019.

S. Myrtle Grade Crossing

- Train Operators improved use of the Train-to-Wayside (TWC) control system to cancel gate activation during long dwell times at Monrovia Station.
- Implemented change Dec 2019.

Ave 45 Grade Crossing

- Lift current speed restriction for northbound trains through crossing to reduce gate down times.
- Engineering analysis and testing completed.
- To be implemented September 2020.

E Line Grade Crossing Downtime Actions

26th St Grade Crossing					
	May-October 2019		January- June 2020		Comparison
Downtime (minutes)	# of Instances	% of Total	# of instances	% of Total	
0:00 to 2:59	34577	94.78%	29669	96.40%	Better
3:00 to 4:59	1409	3.86%	877	2.85%	Better
5:00 to 9:59	480	1.32%	217	0.71%	Better
10:00 or more	14	0.04%	14	0.05%	Similar
Total Instances	36480		30777		
Stewart St Grade Crossing					
	May-October 2019		January- June 2020		Comparison
Downtime (minutes)	# of Instances	% of Total	# of instances	% of Total	
0:00 to 2:59	40269	98.57%	32943	98.71%	Similar
3:00 to 4:59	528	1.29%	396	1.19%	Similar
5:00 to 9:59	56	0.14%	31	0.09%	Better
10:00 or more	1	0.00%	3	0.01%	Worst
Total Instances	40854		33373		
20th St Grade Crossing					
	May-October 2019		January- June 2020		Comparison
Downtime (minutes)	# of Instances	% of Total	# of instances	% of Total	
0:00 to 2:59	38165	98.49%	32934	98.75%	Similar
3:00 to 4:59	540	1.39%	383	1.15%	Similar
5:00 to 9:59	44	0.11%	26	0.08%	Better
10:00 or more	1	0.00%	7	0.02%	Worst
Total Instances	38750		33350		

26th St. Grade Crossing

- Proximity to 26th Station and Yard
- Train Operators to consistently use TWC control system to cancel gate activation during long dwell times
- Change schedule for northbound yard pull-ins to avoid train bunching

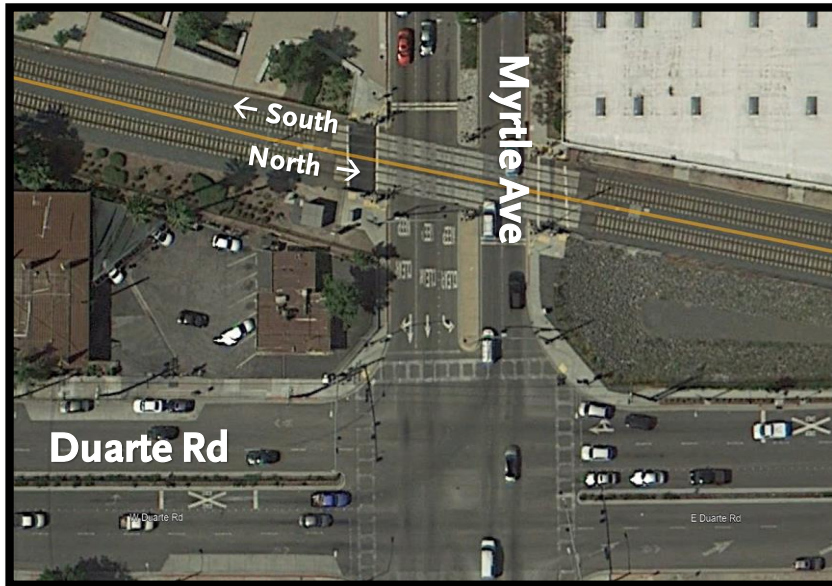
Stewart St. Grade Crossing

- Crossing is within the Yard limits
- Temporary slow order in place while track bed is being improved.
- Allow northbound yard pull-ins and gate activation only when the route into the yard is clear.
- Temporary modification to gate activation circuits will be done to match current restricted speed.

20th St. Grade Crossing

- Change schedule for northbound yard pull-ins to avoid train bunching.

Caltrans Traffic Controller Upgrade Project



Caltrans Traffic Controller Upgrade Project

- Caltrans and LA County are upgrading the traffic signals system firmware, timing and controllers via the I-210 Fwy Corridor Project.
- Prioritizing traffic signals at Duarte Rd/Myrtle Ave and Duarte Rd/Mountain intersections.
- Target completion date is September 30, 2020.