



**Metro**

Los Angeles County  
Metropolitan Transportation Authority

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**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**

- **26<sup>th</sup> St. Grade Crossing** – Reviewed proximity to 26<sup>th</sup> 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.
- **20<sup>th</sup> 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

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**

- 26<sup>th</sup> St. Grade Crossing – Reviewed proximity to 26<sup>th</sup> 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.
- 20<sup>th</sup> 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%
<b>Total Instances</b>	<b>32909</b>	

#### 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%
<b>Total Instances</b>	<b>1036616</b>	

#### 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%
<b>Total Instances</b>	<b>37403</b>	

#### 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%
<b>Total Instances</b>	<b>35851</b>	

#### 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%
<b>Total Instances</b>	<b>33820</b>	

#### 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%
<b>Total Instances</b>	<b>37239</b>	

#### 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%
<b>Total Instances</b>	<b>36152</b>	

#### 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%
<b>Total Instances</b>	<b>34904</b>	

#### 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%
<b>Total Instances</b>	<b>33528</b>	

**MOUNTAIN CROSSING**

<b>Downtime (minutes)</b>	<b># of instances</b>	<b>% of Total</b>
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%
<b>Total Instances</b>	<b>33860</b>	

**CALIFORNIA CROSSING**

<b>Downtime (minutes)</b>	<b># of instances</b>	<b>% of Total</b>
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%
<b>Total Instances</b>	<b>32194</b>	

**MAGNOLIA CROSSING**

<b>Downtime (minutes)</b>	<b># of instances</b>	<b>% of Total</b>
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%
<b>Total Instances</b>	<b>34705</b>	

**MAYFLOWER CROSSING**

<b>Downtime (minutes)</b>	<b># of instances</b>	<b>% of Total</b>
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%
<b>Total Instances</b>	<b>34445</b>	

**S. MYRTLE CROSSING**

<b>Downtime (minutes)</b>	<b># of instances</b>	<b>% of Total</b>
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%
<b>Total Instances</b>	<b>31868</b>	

**ARROYO VERDIE CROSSING**

<b>Downtime (minutes)</b>	<b># of instances</b>	<b>% of Total</b>
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%
<b>Total Instances</b>	<b>30660</b>	

**AVE 33 CROSSING**

<b>Downtime (minutes)</b>	<b># of instances</b>	<b>% of Total</b>
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%
<b>Total Instances</b>	<b>31174</b>	

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%
<b>Total Instances</b>	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%
<b>Total Instances</b>	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%
<b>Total Instances</b>	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%
<b>Total Instances</b>	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%
<b>Total Instances</b>	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%
<b>Total Instances</b>	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%
<b>Total Instances</b>	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%
<b>Total Instances</b>	32579	

<b>FIGUEROA CROSSING</b>		
<b>Downtime (minutes)</b>	<b># of instances</b>	<b>% of Total</b>
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%
<b>Total Instances</b>	27072	

<b>FREMONT CROSSING</b>		
<b>Downtime (minutes)</b>	<b># of instances</b>	<b>% of Total</b>
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%
<b>Total Instances</b>	31123	

<b>FRENCH CROSSING</b>		
<b>Downtime (minutes)</b>	<b># of instances</b>	<b>% of Total</b>
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%
<b>Total Instances</b>	28804	

<b>GLENARM ST CROSSING</b>		
<b>Downtime (minutes)</b>	<b># of instances</b>	<b>% of Total</b>
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%
<b>Total Instances</b>	27869	

<b>HOPE ST CROSSING</b>		
<b>Downtime (minutes)</b>	<b># of instances</b>	<b>% of Total</b>
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%
<b>Total Instances</b>	30174	

<b>INDIANA CROSSING</b>		
<b>Downtime (minutes)</b>	<b># of instances</b>	<b>% of Total</b>
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%
<b>Total Instances</b>	30047	

<b>MISSION CROSSING</b>		
<b>Downtime (minutes)</b>	<b># of instances</b>	<b>% of Total</b>
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%
<b>Total Instances</b>	30717	

<b>ORANGE GROVE CROSSING</b>		
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<b>Downtime (minutes)</b>	<b># of instances</b>	<b>% of Total</b>
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%
<b>Total Instances</b>	28530	

<b>PASADENA WEST CROSSING</b>		
<b>Downtime (minutes)</b>	<b># of instances</b>	<b>% of Total</b>
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%
<b>Total Instances</b>	28048	

<b>STATE ST PED CROSSING</b>		
<b>Downtime (minutes)</b>	<b># of instances</b>	<b>% of Total</b>
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%
<b>Total Instances</b>	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
<b>Total Instances</b>	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
<b>Total Instances</b>	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
<b>Total Instances</b>	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
<b>Total Instances</b>	<b>36480</b>		<b>30777</b>		
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
<b>Total Instances</b>	<b>40854</b>		<b>33373</b>		
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
<b>Total Instances</b>	<b>38750</b>		<b>33350</b>		

## 26<sup>th</sup> St. Grade Crossing

- Proximity to 26<sup>th</sup> 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

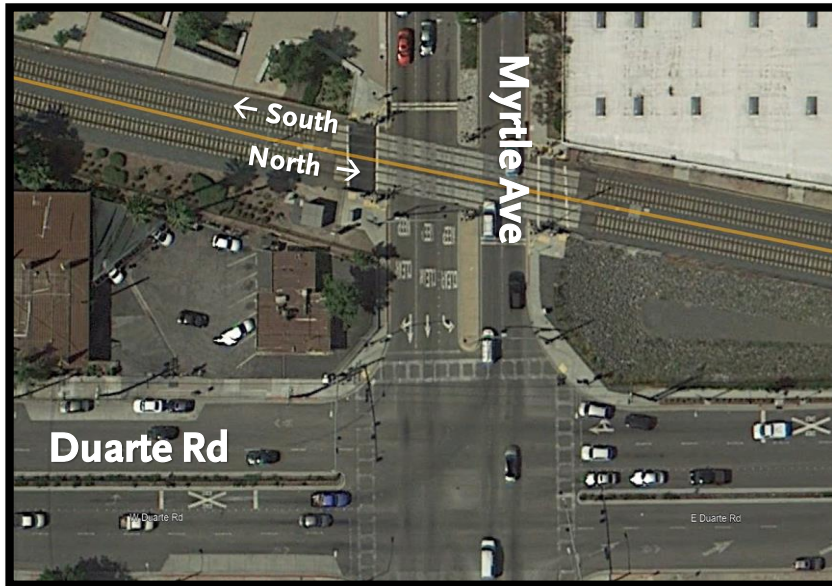
## Stewart St. Grade Crossing

- 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.

## 20<sup>th</sup> 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.