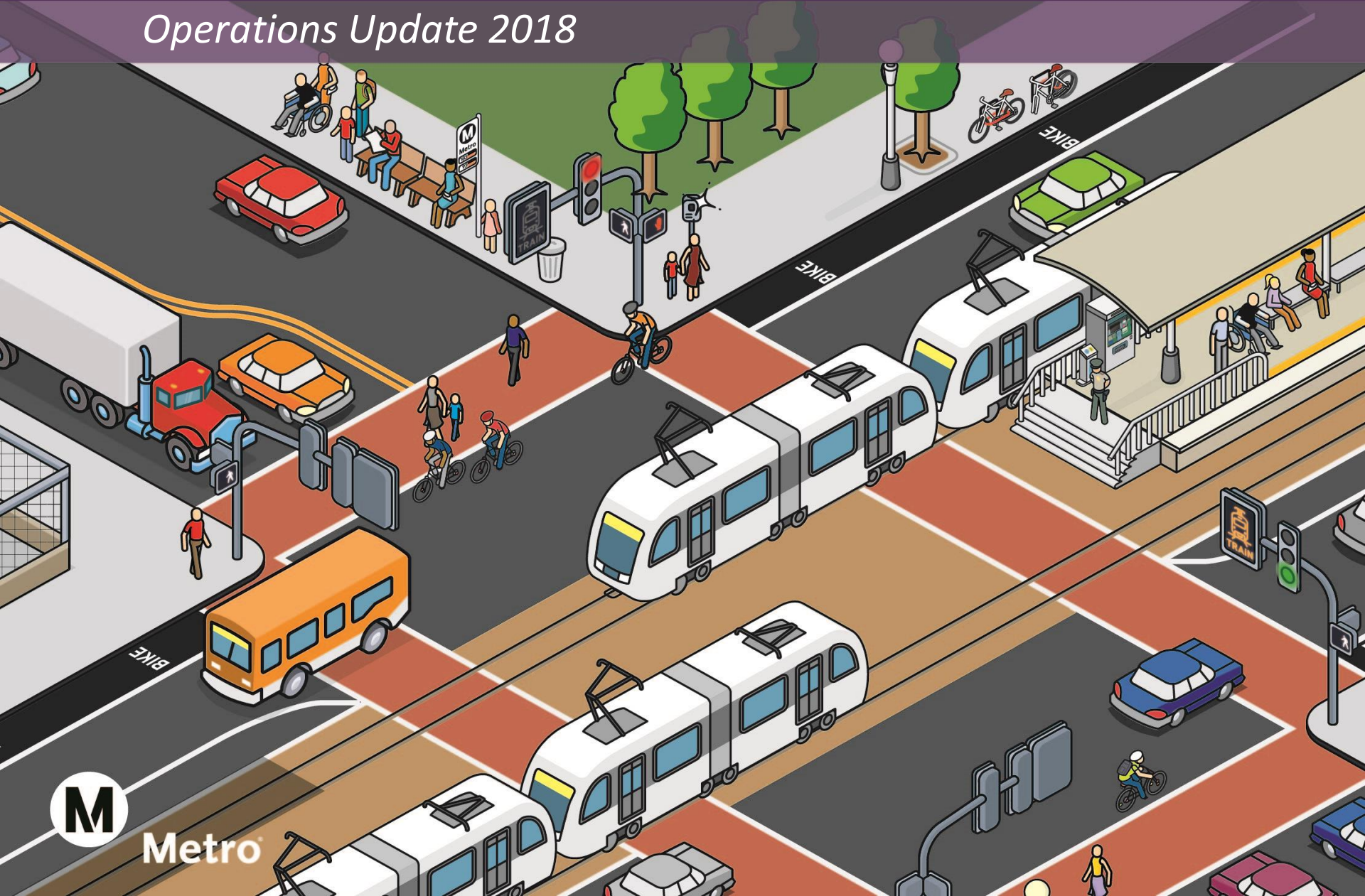


Los Angeles Light Rail Transit

Operations Update 2018



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Welcome to Los Angeles

Los Angeles has a rich history of Light Rail Transit (LRT) service, which emerged from the Interurban and Tram systems of the early twentieth century to the Metro Rail system of today. This presentation will provide the following:

- Urban Insertion LRT topics related to safety and design including: pedestrian and motorist safety, interface with other vehicles, traffic management and train control, overview of incidences within the Metro Rail LRT system.*
- Discussion on policy issues.*



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Los Angeles, California

West Coast, United States



Located on the west coast of the United States of America

Part of the Southern California Region

Los Angeles County is 4083 square miles/10575 square kilometers

88 municipalities

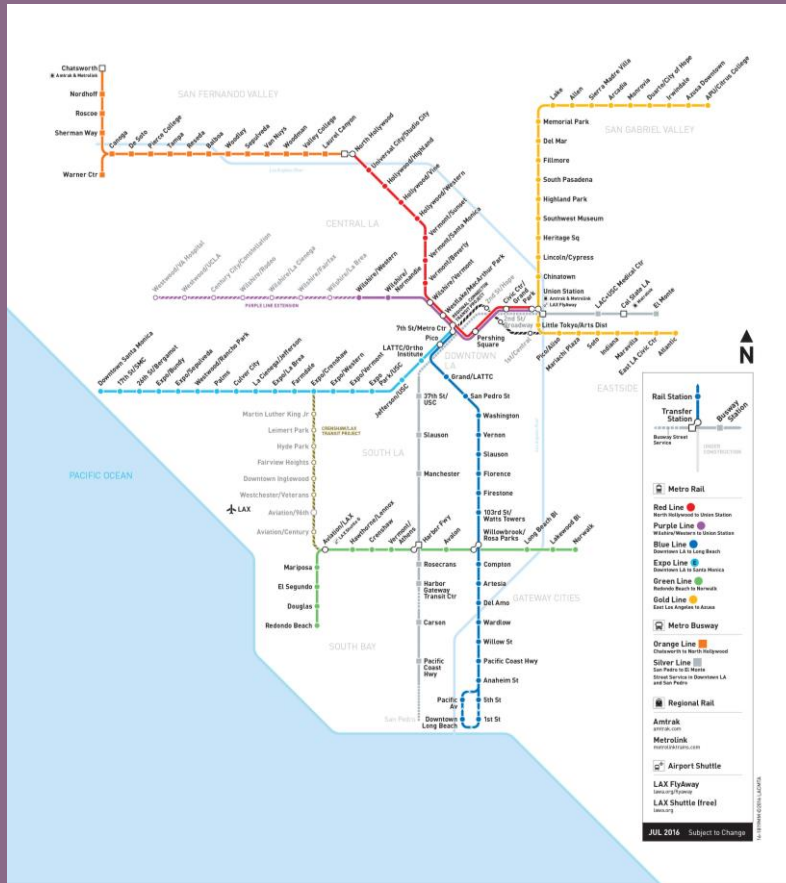
9.8 million people



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Metro Rail

Los Angeles County Metropolitan Transportation Authority



Formed in 1993 via a merger of two agencies
Urban bus and urban rail service

2438 buses

1433 square mile/3711 square kilometer
service area

98 route miles/158 route kilometers of Metro
Rail service

93 stations

1.1 million daily boardings



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Metro Rail

Los Angeles County Metropolitan Transportation Authority



Railway/city
line operations
in segregated
right of way
owned by
Metro

Limited street
running
operations



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Metro Rail

Los Angeles County Metropolitan Transportation Authority



Electric power using pantograph and overhead contact system

High floor vehicles with up to three car consists

Stations accommodate high floor light rail vehicles



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Operations Typology

Light Rail Transit



Street Running Operations

- Typically used for at-grade operations
- Operations governed by city traffic signal/transit priority control at non gated grade crossings
- LRT operations at 35 miles per hour/56 kilometers per hour or lower
- Green band transit signal priority to enable nonstop operations from station to station
- Segregated guideway or mixed mode operations



Cab Signal Operations

- Used in at-grade or grade separated operations
- Gated grade crossings, where operator calls the gates down at each grade crossing
- LRT operations above 35 miles per hour/56 kilometers per hour
- Used in either pre-emption or priority mode
- Segregated guideway



Operations Typology

Light Rail Transit



- Automatic Train Operations (ATO)
- Operator provides visual inspection of doors and track approach
- No grade crossings
- LRT set to operating speed
- Segregated guideway – closed, exclusive railway right-of-way
- ATO is not driverless



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Segregated Guideway Features

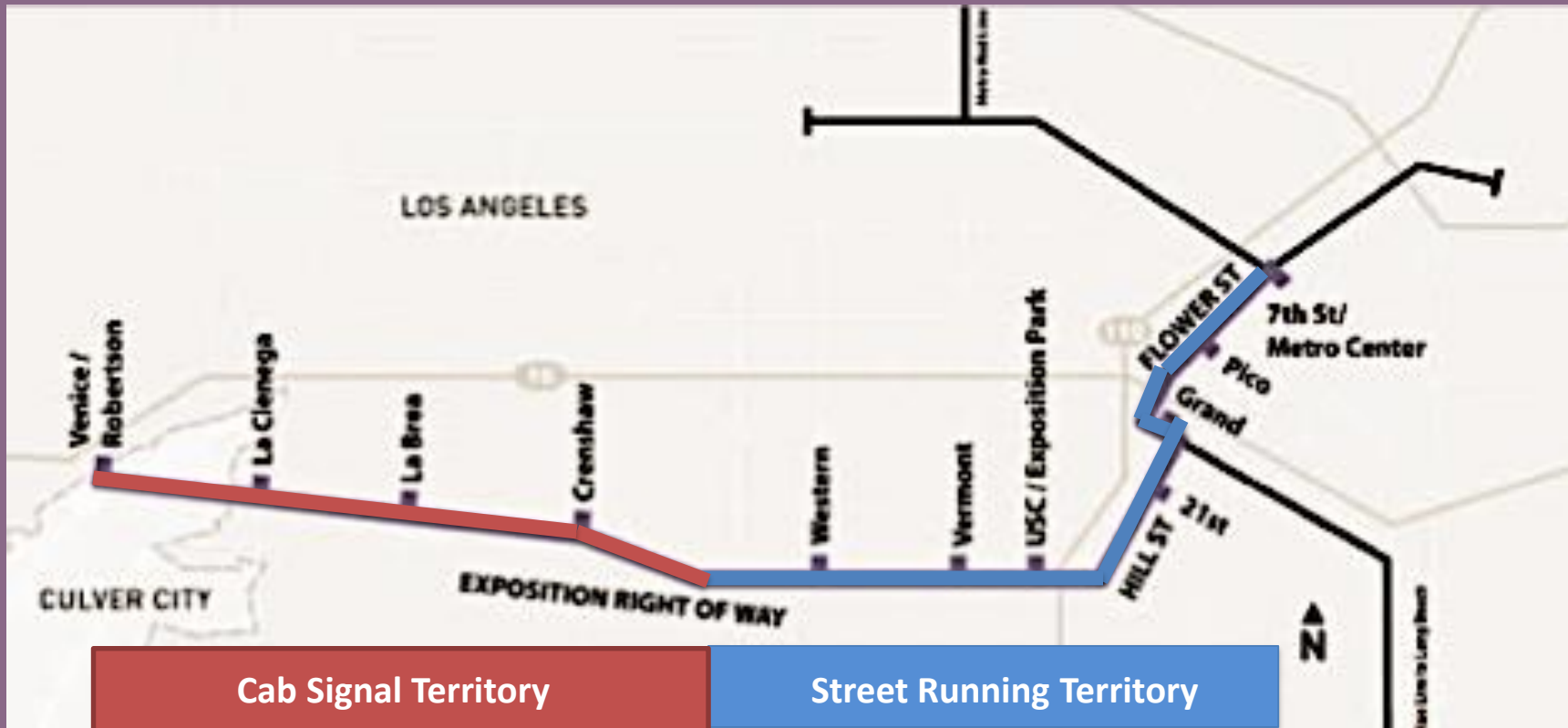
Typical Light Rail Transit Corridor



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Segregated Guideway Features

Combination of Cab Signal and Street Running Operations



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Segregated Guideway Features

For At-Grade Stations next to Grade Crossings



Split Platform Stations

*Near Side
Far Side*

*Allows for vehicular
left turns*

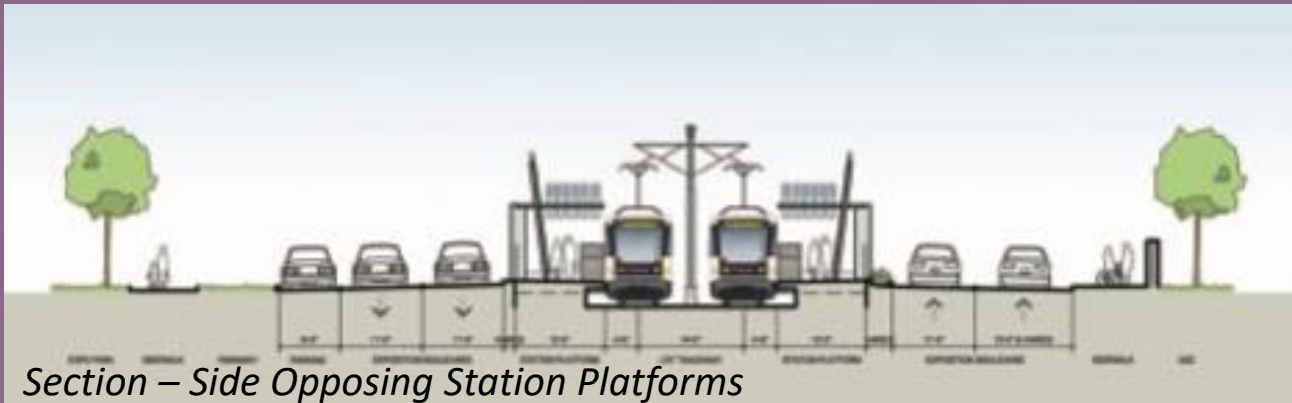
*Center Platform
Stations preferred for
single track situations*



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Segregated Guideway Features

Side Platforms and Center/Median Running Guideway



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Segregated Guideway Features

Transit Parkway Design



Removal of two vehicular traffic lanes to allow for double track LRT alignment, bike lanes and transit parkway



City Traffic Control – Green Band Priority mode



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Multimodal Safety, At-Grade Crossings

Light Rail Transit



A variety of techniques are available for enhancing pedestrian safety at light rail at-grade crossings.

Passive signing, pavement marking, barrier channelization, active warning devices, pedestrian gates



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At-Grade Crossings, Signals and Gate Protection

Light Rail Transit



Bar Signals and other city traffic and transit priority devices in Street Running territory



Four Quadrant Gates, typically located in Cab Signal territory

Motorist Safety Signals



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Accident Data

For Light Rail Transit Corridors, Line by Line Analysis

		Expo	
2/22/16	8:37	10-73	Exposition and Normandie
3/5/16	21:47	10-73	Exposition and Hauser
4/13/16	8:29	10-73	Exposition and Denker
9/13/16	9:47	10-72	17th Street Station Ped Xing
9/26/16	1:27	10-73	Flower and Washington
10/17/16	11:00	10-72	Exposition and Arlington
10/30/16	8:40	10-72	Bagley GC
10/31/16	15:27	10-73	Halldale and Exposition
12/21/16	17:27	10-73	Colorado and 7th
1/8/17	11:00	10-73	Flower and 30th
2/11/17	21:57	10-72	Colorado and 7th
2/16/17	19:23	10-73	Exposition and Crenshaw
4/10/17	10:17	10-73	Exposition and Halldale
7/31/17	7:38	10-73	Colorado and Lincoln
7/31/17	19:19	10-73	Colorado and 11th
8/23/17	19:08	10-73	Colorado and 14th
9/15/17	13:27	10-73	Expo and 11th/Degnan
10/7/17	10:34	10-72	Expo and Normandie
10/9/17	7:37	10-73	17th Street Station
10/17/17	16:40	10-72	Crenshaw GC
10/23/17	20:29	10-73	Watt Way
10/28/17	11:23	10-73	17th Street Station
11/5/17	23:07	10-72	28th Street
11/15/17	17:12	10-73	Exposition and Raymond
12/2/21017	22:51	10-73	S. of Jefferson Station
2/6/18	21:24	10-72	Denker
3/2/18	15:24	10-73	7th Avenue
3/5/18	11:42	10-72	Lincoln and Colorado
4/11/18	15:09	10-73	Lincoln and Colorado
4/18/18	0:23	10-73	Exposition and Raymond
5/25/18	18:18	10-73	Exposition and Denker
9/2/18	11:02	10-73	23rd Street Station
9/24/18	10:20	10-72	Flower and Adams
11/7/18	13:29	10-73	17th Street S. Ped.Xing
11/16/18	19:33	10-72	

Number of Collisions	2016	2017	2018
Train versus Pedestrians	3	4	4
Train versus Vehicles	6	12	6

Exposition Line

10-72 Train versus Pedestrians

10-73 Train versus Vehicles

Operator's Rule Book code used to report incident

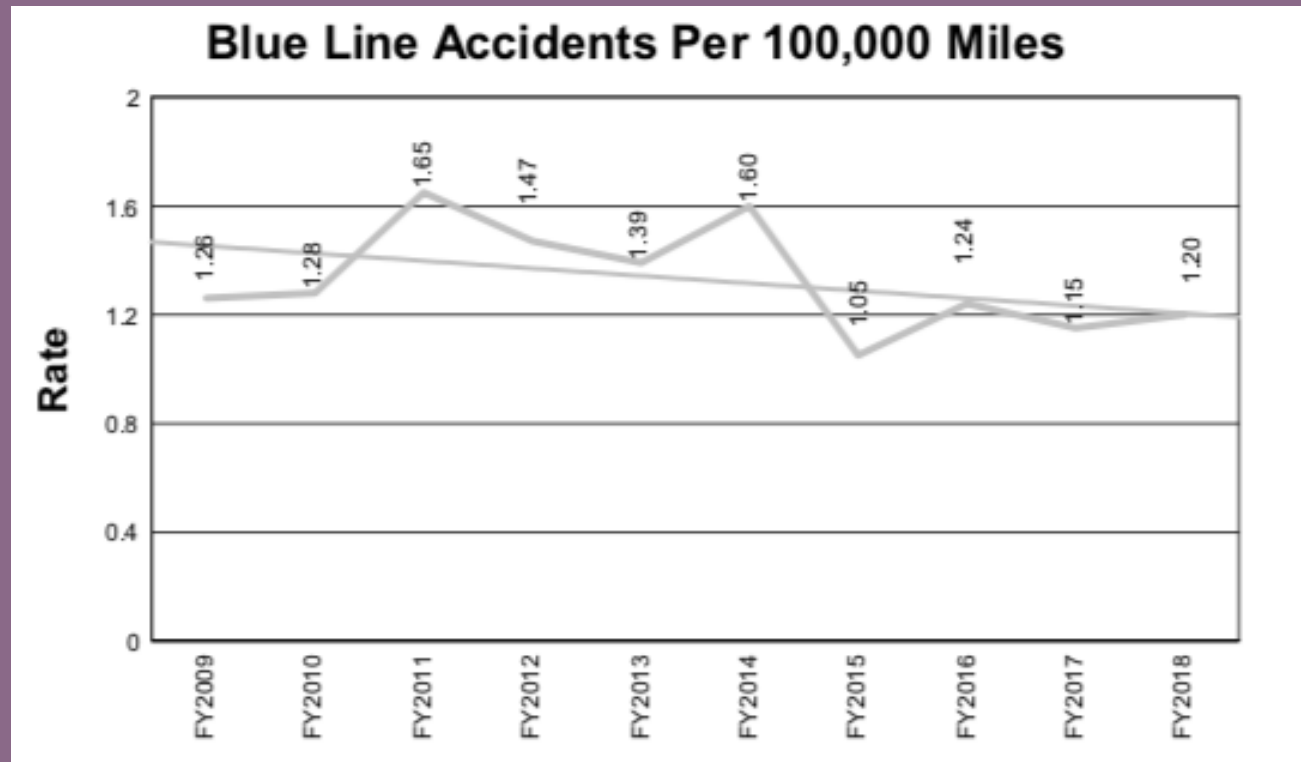
Raw data entry categorized by date, time, type of collision and grade crossing location



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Accident Data

For Light Rail Transit Corridors, 10 Year Analysis



Metro Blue Line

FY18 Accident Rates:

1.20 per 100,000 miles

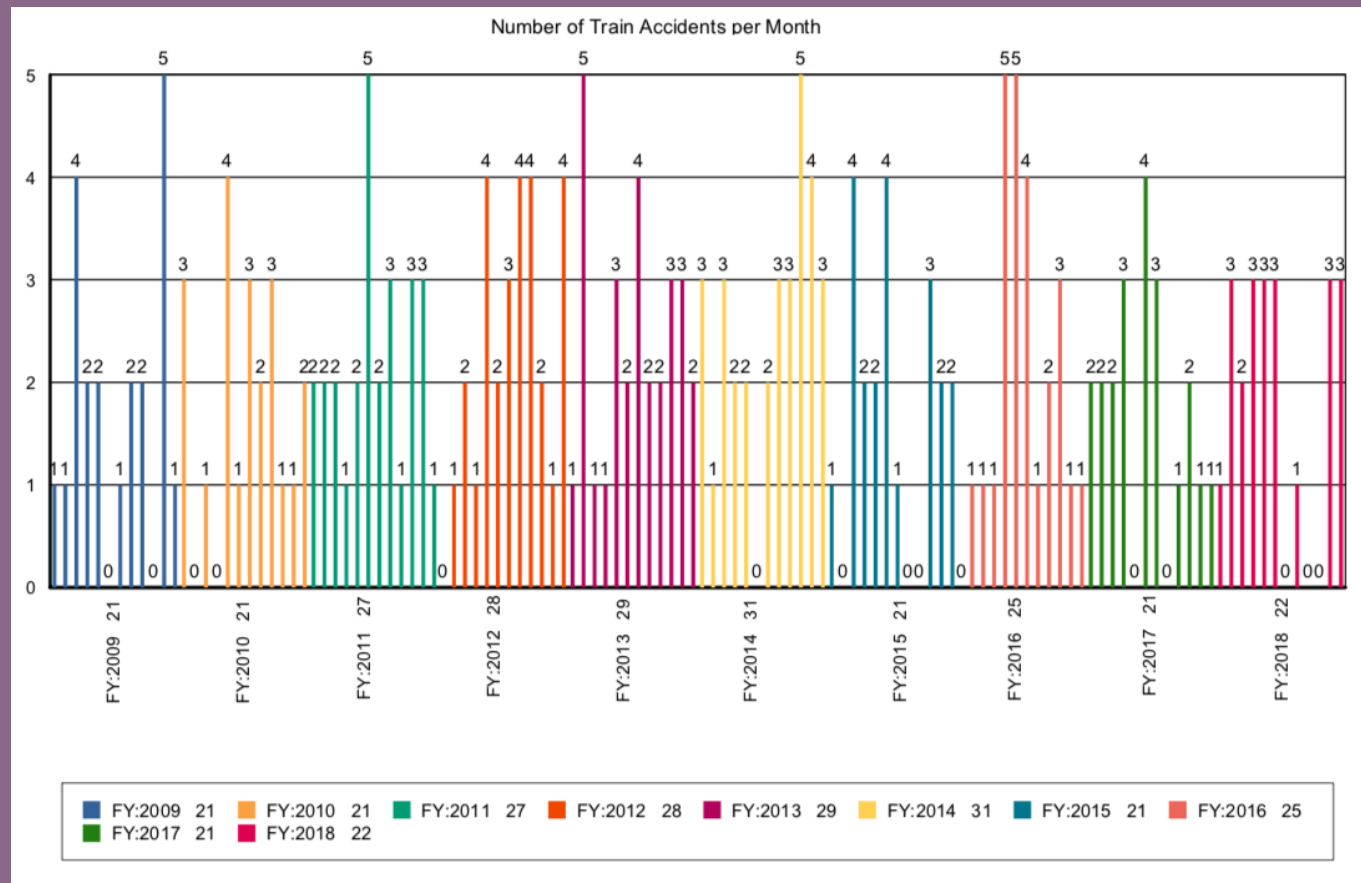
22 accidents per 1,835,961 miles



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Accident Data

For Light Rail Transit Corridors, 10 Year Analysis



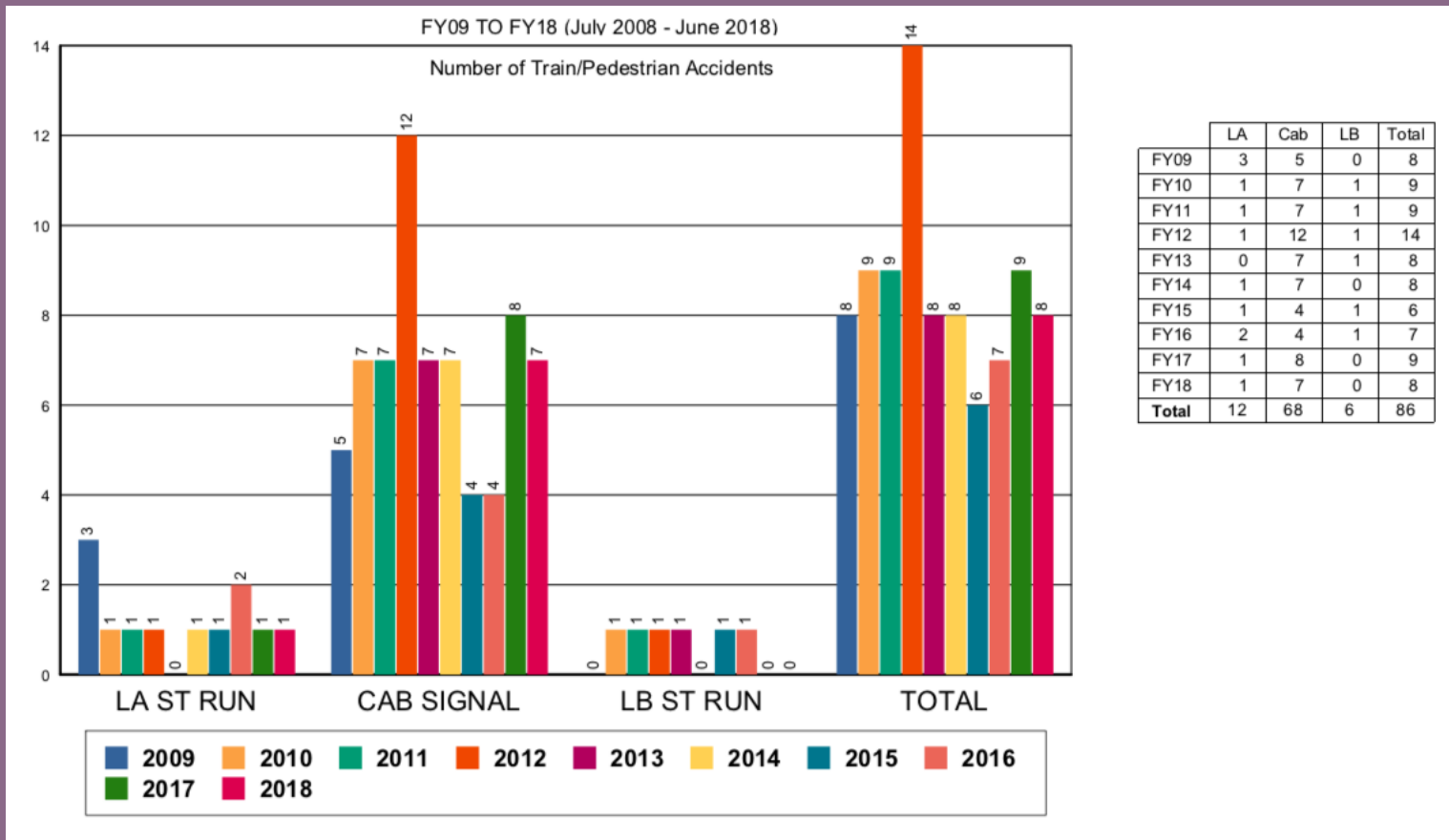
Accidents by month



Metro

Accident Data

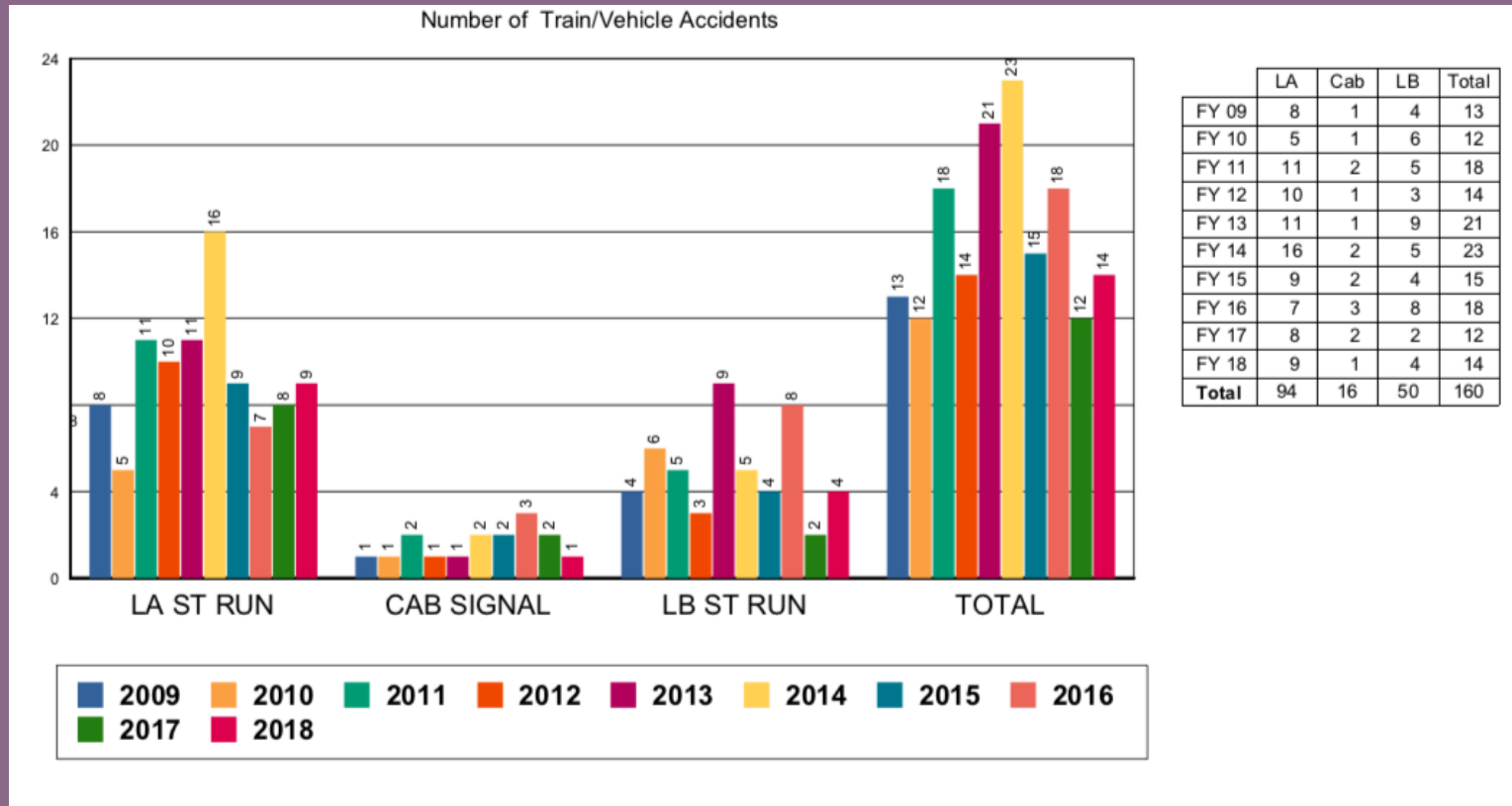
For Light Rail Transit Corridors, 10 Year Analysis



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Accident Data

For Light Rail Transit Corridors, 10 Year Analysis



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Grade Crossing Policy

For Light Rail Transit Corridors, 10 Year Analysis

SUMMARY OF FATALITIES TRAIN/VEHICLE AND TRAIN/PEDESTRIAN COLLISIONS July 01, 2008 through June 30, 2018							
Date	Vehicle	Pedestrian	Total	Loc No	Location	Segment	Contributing Factor -Suicide
11/22/2008		1		0112	18TH ST	LA	
01/28/2009		1		1529	DE LAMOSTA	CAB	
05/21/2009		1		0091_0092	bet day@1370 Flw & day @ Capress	LA	
05/21/2009		1		0460	48TH PL	CAB	
06/28/2009		1		1010	124TH ST	CAB	
FY 2009 TOTAL	0	5	5				
07/26/2009		1		1350	ARTESIA FWY OVER	CAB	✓
11/20/2009		1		0930	WUMINGTON AVE	CAB	
12/27/2009		1		0420	VERNON AVE	CAB	✓
02/19/2010		1		0820	CENTURY BLVD	CAB	
06/02/2010		1		0104	DRIVEWAY NORTH OF I-10 ON RAMP	LA	✓
FY 2010 TOTAL	0	5	5				
12/03/2010		1		1050	130TH ST	CAB	
01/20/2011		1		1750	WARDLOW RD	CAB	
02/22/2011		1		0940	103RD ST	CAB	
04/01/2011		1		1965	PCH STATION	LB	
05/27/2011		1		1319	ARTESIA PED	CAB	
06/04/2011		1		1529	DE LAMOSTA	CAB	✓
FY 2011 TOTAL	0	6	6				
09/24/2011		1		1319	ARTESIA PED	CAB	
11/11/2011		1		1020	BETWEEN 124TH AND EL SEGUNDO	CAB	✓
12/28/2011		1		1240	ALONDRA BLVD	CAB	✓
01/03/2012		1		1810	SPRING ST	CAB	✓
02/12/2012		1		0840	103RD ST	CAB	
03/09/2012		1		1150	ELM ST	CAB	✓
03/20/2012		1		0770	32ND ST	CAB	✓
04/19/2012		1		0951	IMPERIAL STATION	CAB	✓
05/12/2012		1		1080	STOCKWELL ST	CAB	
FY 2012 TOTAL	0	9	9				
07/13/2012		1		1040	EL SEGUNDO BLVD	CAB	
08/02/2012	1			1950	19TH ST	LB	
12/13/2012		1		1150	ELM ST	CAB	
01/11/2013		1		0426	VERNON STA	CAB	
02/09/2013		1		0820	CENTURY BLVD	CAB	

05/28/2013		1		1529	DE LAMOSTA	CAB	✓
FY 2013 TOTAL	1	5	6				
09/05/2013		1		0880	108TH	CAB	✓
09/27/2013		1		0426	VERNON STA	CAB	
06/28/2014		1		0570	GAGE AVE	CAB	
06/29/2014		1		0570	GAGE AVE	CAB	
FY 2014 TOTAL	0	4	4				
09/09/2014		1		2167	PACIFIC STATION	LB	
09/12/2014	1			1890	BURNETT ST	LB	
12/09/2014		1		0670	NADEAU ST	CAB	
01/02/2015		1		0340	24TH ST	CAB	
FY 2015 TOTAL	1	3	4				
09/28/2015		1		1322	ARTESIA STA	CAB	
12/02/2015		1		0390	41ST ST	CAB	✓
06/21/2016		1		0198	TRINITY ST	LA	✓
FY 2016 TOTAL	0	3	3				
08/13/2016		1		1350	ARTESIA FWY OVER	CAB	
01/06/2017		1		1040	EL SEGUNDO BLVD	CAB	
05/16/2017		1		0980	119TH ST	CAB	✓
FY 2017 TOTAL	0	3	3				
08/29/2017		1		1744	WARDLOW STA	CAB	✓
FY 2018 TOTAL	0	1	1				
Grand Total	2	44	46				16

*10 Year Total – Metro Blue Line
246 Accidents Total
30 Fatalities, including 16
Suicide Related Fatalities
11 Mirror Accidents*



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Summary

Light Rail Transit Operations

- Accidents generally increase after the Revenue Service Date of the line, as ridership grows and/or due to line extensions
- More Train/Pedestrian collisions occur in Cab Signal territory than in street running territory
- More Train/Vehicular collisions occur in Street Running territory than in Cab Signal territory
- There are fatalities, in which half of the fatalities are suicidal, at least for one of the legacy lines - Metro Blue Line
- The trend over time seems to be lower Train/Pedestrian and Train/Vehicular accidents, apparent over a 10 year period
- The lowest number of collisions occur in LRT Automatic Train Operations



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Challenges



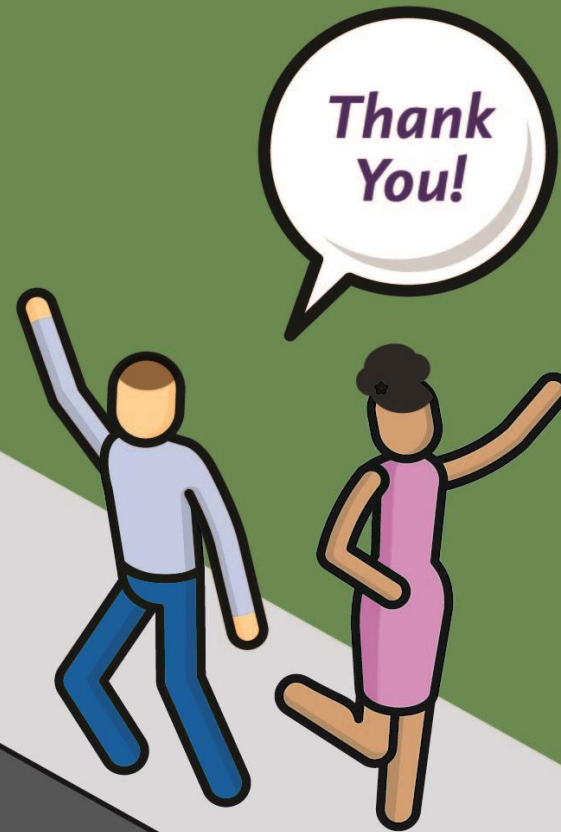
*Safety
Program
Implementation*

*Policy Issues:
Vision Zero*



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See you soon



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