

Towards a Passenger-focused On-Time Performance Metric for Commuter Rail

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Outline

- History
- Case Study: Caltrain
- Comparison
- Conclusion



Today's On-Time Performance Metrics

- Most use 5 minutes, 59 seconds at the terminal
 - Some use 5 minutes
 - Others measure at intermediate stations

How We Measure Delay

Like other commuter railroads, Metra considers a train to have operated on time if it reaches its final destination within five minutes and 59 seconds of its scheduled arrival.

Years ago, railroads across the nation decided that delays of less than six minutes would not be factored into a railroad's on-time performance. The idea was to use that threshold



Turn-of-the-Century Performance

- “Ask the Conductor; He has the Right Time”
- Federal vs. State interests
- “Endeavor by every means in its power to correct such wretched service.”



New York Public Services Commission – Second District

To all Steam Railroad Corporations :

- Circular #34 – March 16, 1908
- Report on total number of trains operated and those delayed by 5 minutes or more at the terminal
- Monthly “Passenger Train Delay Bulletin”
- Includes Long Island Railroad



Issues with Terminal OTP

- All trains weighted equally
- Easy to game
- Not representative of passenger flows
- How different is the passenger experience from what agencies report?

Lateness of Commuting Trains

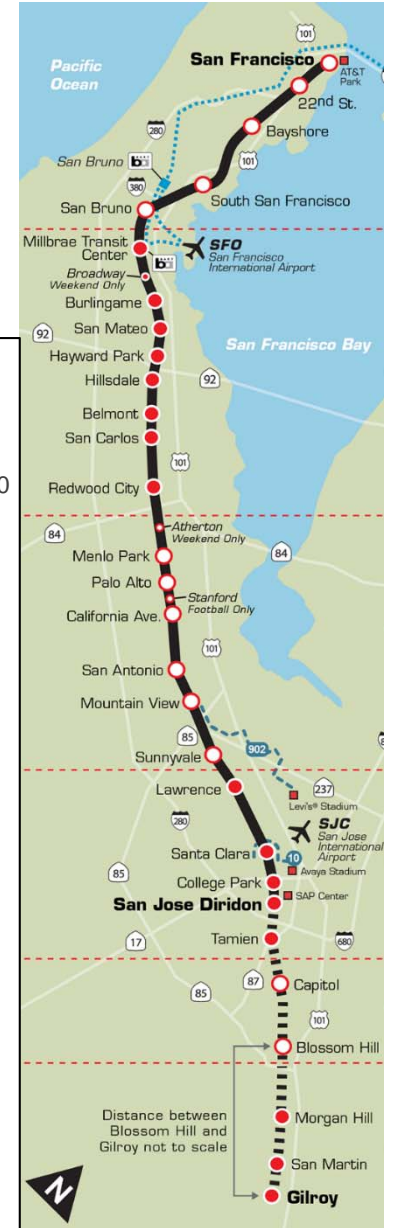
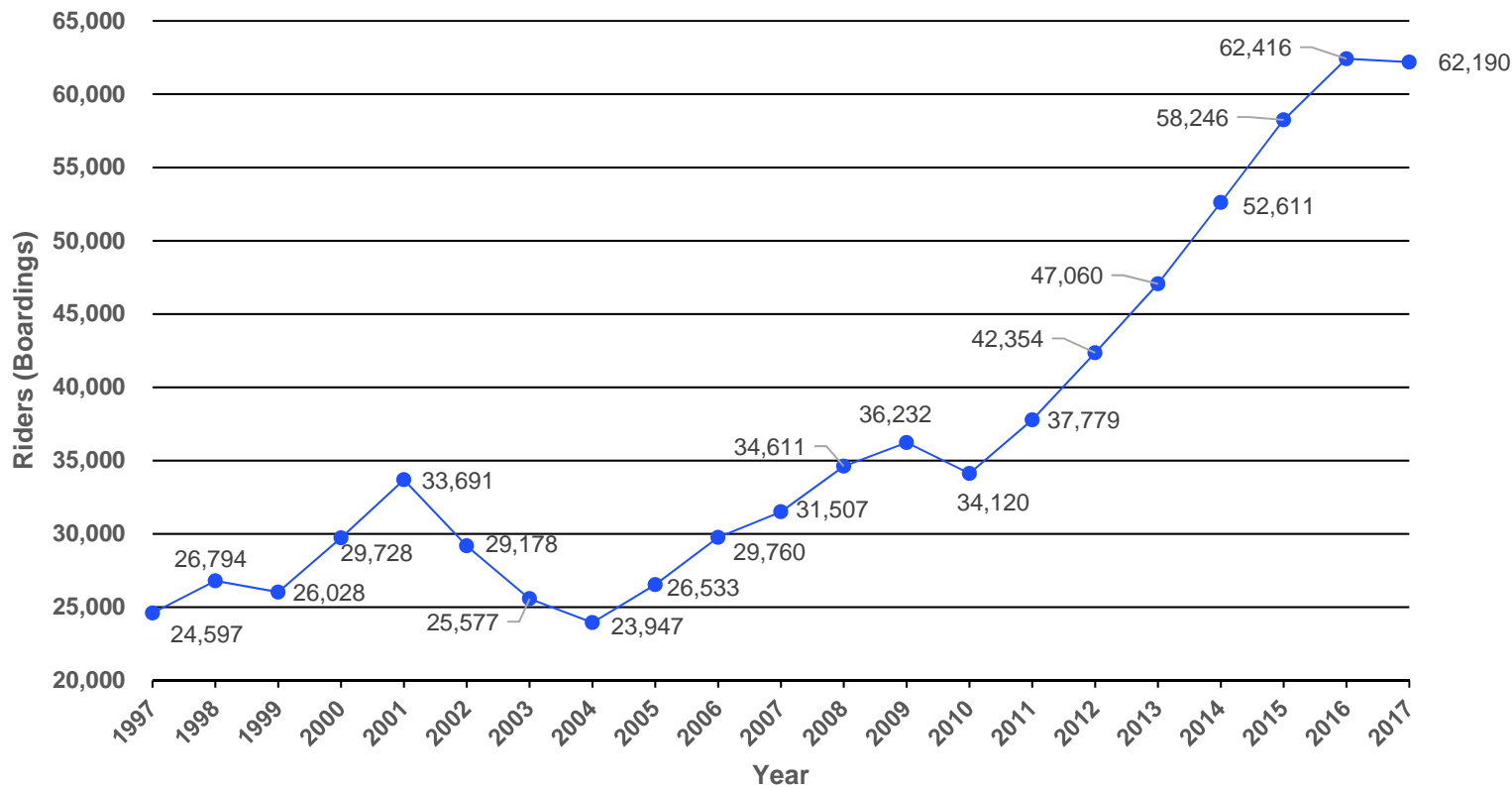
TO THE EDITOR OF THE NEW YORK TIMES:

A recent news item reported that the on-time performance index of the Long Island Rail Road for December was 98.64. I would like to protest the repetition of this **statistical hoax** which has repeatedly attempted to mislead the public over the years.

The fallacy of this claim, which is not readily apparent, is that it represents an index of on-time performance based on a twenty-four-hour operation. This, in effect, allows the railroad to take credit for trains being on time at 3 o'clock in the morning or 1 o'clock in the afternoon, when no operating problem confronts them during these hours.

Case Study: Caltrain

Caltrain Average Weekday Ridership Trend



Caltrain Alightings

Northbound

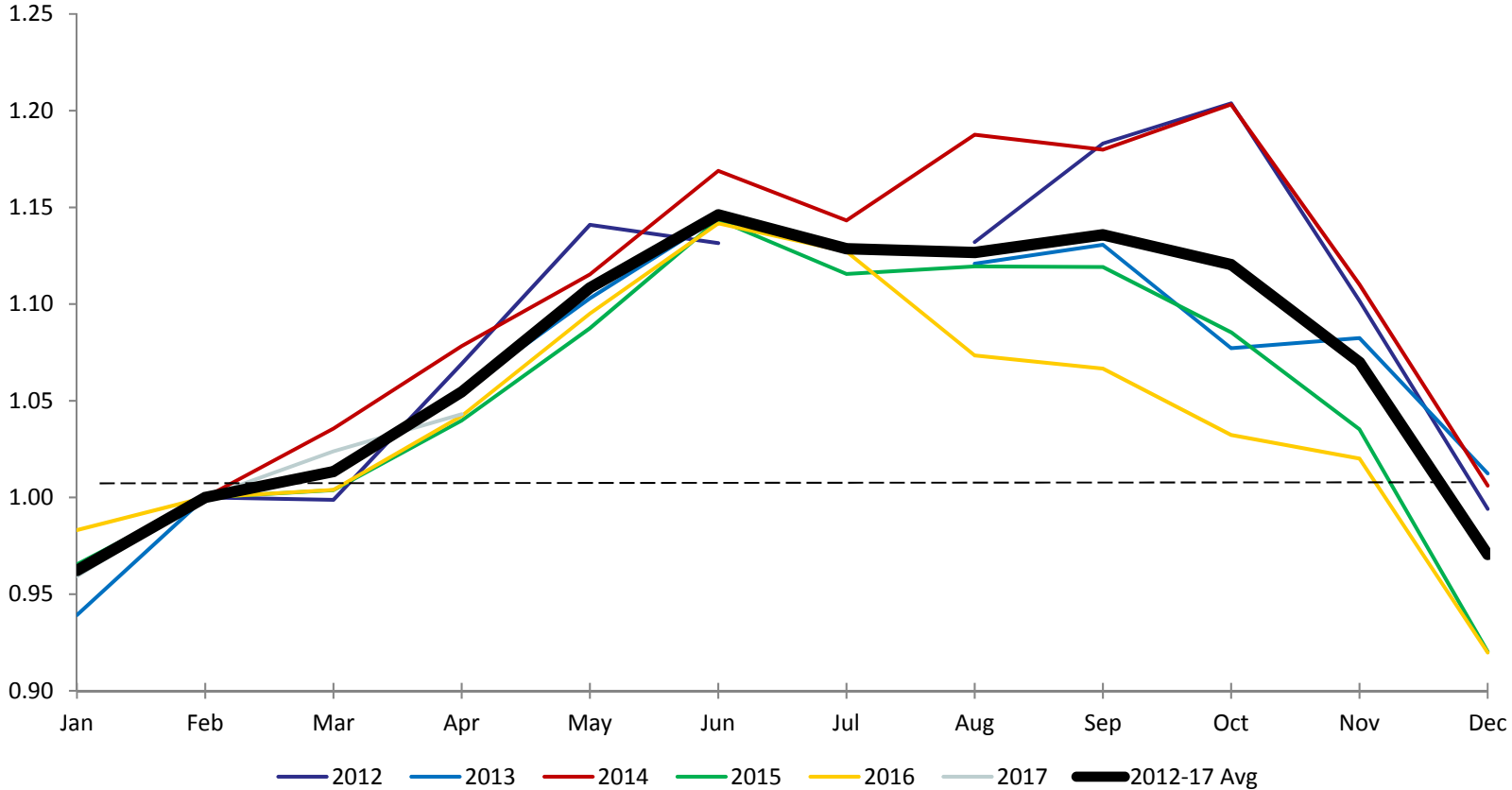
Train	SF	22nd	Bay	SSF	S Brun	Mill	Burl	S Mat	Hay P	Hill	Belm	S Carl	RWC	Menlo	PA	Cal Ave	S Anton	Mt V	Sunny	Law	SC	Coll P	SJ	Tam	Cap	Bloss	Morg	S Mart	Gilroy			
101	76	4	1	2	2	16	3	1	0	1	1	2	4	2	5	2	0	1	0	1	0											
103	121	13	4	6	6	29	1	1	1	2	1	3	4	3	20	4	1	0	2	0	0		0									
305	303					41				11					42			3														
207	377			26	53					17			14	15	44	7	3	6	2	4	1		1									
309	472				60			7					19		123			4					2									
211	185	19	11	15	13	48	11	10	4	5	15	24	22	39				7	3													
313	706				86					26					183			13														
215	714				21					21		31			92	26		5	2													
217	805				62					63			26	38	137	40	14	36	7	18	8		8	83	1	0	0	0				
319	822				97			45					90		201			14					0									
221	334	42	10	29	18	112	19	38	31	36	24	39	76	110				41	18	20	10		13	13	1	1	0	0				
323	888				21	79				79					222			26														
225	823				19	14	33			39		37			110	56		15	8													
227	594			32	68					33			40	42	127	59	18	34	14	34	14	38	22	65	0	2	0	0	1			
329	917				83			37					112		298			26					1									
231	399	21	6	12	12	43	17	32	16	44	17	36	100	96				27	11			1										
233	599				13	51	13	31		32	12	20	73	30	231	74	20	48	28	10	2											
135	295	20	3	5	8	53	14	20	8	18	4	14	72	25	152	54	9	24	12	4	1											
237	286				5	42	6	13		11	4	8	43	14	91	24	3	15	8	3	1		2									
139	166	17	2	4	3	46	5	8	3	5	4	3	21	10	57	17	3	6	4	2	2											
143	197	11	6	4	7	49	8	13	4	7	5	4	16	10	46	7	5	9	3	2	1											
147	195	12	4	3	6	55	14	10	3	13	11	7	22	8	32	5	3	5	2	1	0											
151	204	17	7	4	11	61	12	15	6	29	8	7	19	10	22	6	3	3	4	2	1											
155	188	24	9	8	17	66	16	21	11	19	7	9	24	8	20	5	3	5	3	2	0											
257	159				10	49	10	20		12	7	12	16	9	14	2	1	1	1	0	1		0									
159	151	39	19	9	23	79	31	34	14	27	13	22	26	15	22	5	6	14	6	5	1	0										
261	350	124			169		67			43	50	16	21		6	4	4	2	1	0		0										
263	112	24	22	11	23	72	29	20	15	46	23	13	16		8						1		0									
365	356	143			160					34	14	10			7																	
267	223	82			41	50	58		101		41		12	16				1		1												
269	434	159			165	110				72	86	22	25	13	14			5	4	1	0		0									
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273	118	27	28	14	30	77	35	32	27	59	50	23	32		18						1		0									
375	440	170			158					56	20	28			14																	
277	231	104			42	57	84		92		58		21	20				6		3												
279	271	119			98	66				41	71	23	20	20	16			9	6	2	9		3									
381	205	90			114					54				12				6														
283	57	15	15	9	18	44	29	15	10	41	26	12	20		14						4		1									
385	296	132			85					29	12	16			11																	
287	125	44			15	22	34		42		20		12	9				8		6			0									
289	160	52			55	19	24		22		11	34	8	9	6			8		1												
191	77	23	11	5	9	32	8	16	6	12	13	6	18	6	11	2	7	5	4	2	1											
193	160	49	8	3	11	52	11	19	6	20	10	13	28	13	7	4	4	6	3	1	2											
195	160	41	9	4	18	51	12	19	4	14	10	8	25	7	8	4	4	6	2	1	1		0									
197	98	21	5	4	6	35	8	14	4	13	5	5	14	6	7	3	3	3	3	1	0		0									
199	54	11	3	4	9	14	6	4	3	7	4	3	12	4	6	3	3	3	2	1	0											

Southbound

Train	SF	22nd	Bay	SSF	S Brun	Mill	Burl	S Mat	Hay P	Hill	Belm	S Carl	RWC	Menlo	PA	Cal Ave	S Anton	Mt V	Sunny	Law	SC	Coll P	SJ	Tam	Cap	Bloss	Morg	S Mart	Gilroy			
102	0	0	0	0	2	1	0	1	1	1	1	2	6	3	28	5	1	12	6	2	8		24									
104	0	0	0	1	0	1	1	2	2	2	2	5	12	7	51	9	8	18	10	4	7		14	4								
206	0				2	2	6		10				10	29	14	106	28		83		31		38									
208	0	0	3	2	4	1	6	11	11	9	17	47			198						31		48	4								
210	0				1			11					33	46	79	153	76	37	60	49	27	14	79	14	3							
312	1				3								99	37	176						133		69									
314	1				6					76					253						182		75									
216	0				5			9	14				29		73	193					95		49									
218	0	1	22	3	4	6	15	19	25	20	14	83			261						56		45	3								
220	0				12			37					41	95	56	188	194	69	122	82	41	13		14	2							
322	1				12								172	51	239						186		84									
324	3				12					84					324						280		61									
226	0				12			22	31				36		56	143					121		27									
228	1	2	26	5	5	12	19	20	28	19	19	73			179						40		28	2								
230	2				11			57					25	91	40	143	128	46	103	44	18	12		12	4							
332	0				12								147	36	196						210		62									
232	0	2	13	5	5	11	25	19	41	9	11	35	19	89	42	8	45	21	8	10		13										
236	4	3	10	31				21	8	13	56	23	117	28	14	46	16	8	14			28	2									
138	0	0	5	3	3	6	21	9	14	6	12	35	12	94	23	8	42	17	5	11		34										
142	0	1	4	3	9	8	18	5	12	9	9	34	20	97	27	12	46	30	9	23		63										
146	0	0	3	4	3	9	13	6	20	11	11	35	21	78	17	15	41	23	8	26		67										
150	0	1	2	4	8	12	17	5																								

Caltrain Monthly Ridership

Caltrain Average Weekday Ridership by Month
(Normalized, Feb = 1)

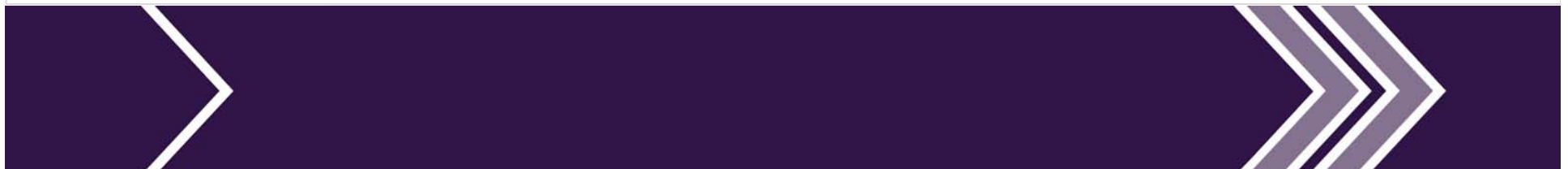
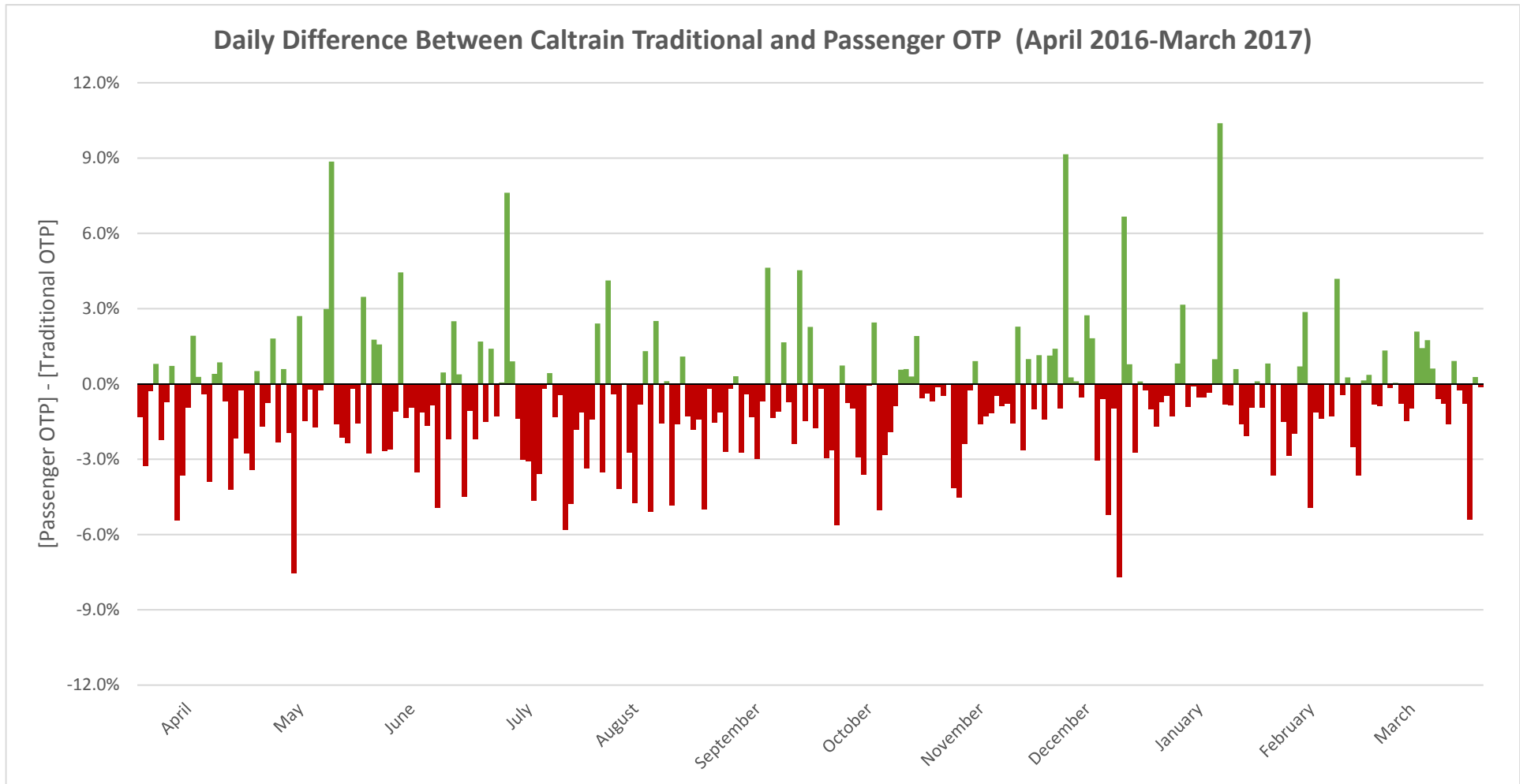


Caltrain Performance Data

- Track circuit occupancy times
- Arrivals at adjacent stations are estimated to the nearest minute
- Aggregated with passenger alightings at each station
- Still using 5m59s threshold

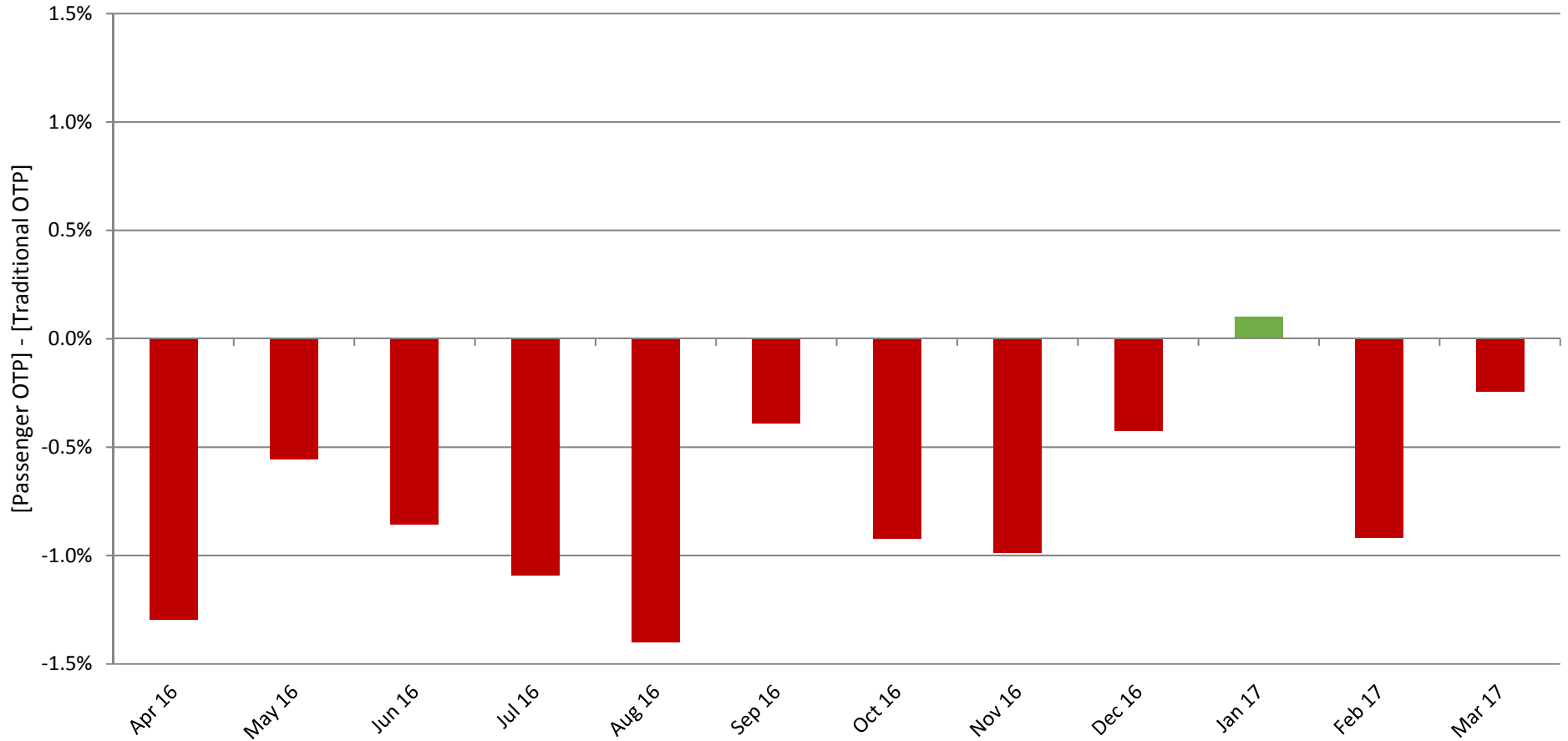


Metric Comparison: Daily



Metric Comparison: Monthly

Monthly Difference Between Caltrain Traditional and Passenger OTP (April 2016-March 2017)



Conclusions

- Terminal-based OTP is literally an antique
- Data requirements are manageable
 - Real time location data (AVL or track circuits)
 - Ridership data for current schedule
- Community/Agency conversations
 - Reporting frequency (daily vs. monthly)
 - What is a reasonable margin?



BACKUP



Caltrain OTP Reporting

