

Appendix N

Weight Requirements for Transit Buses in California

Note: This document was originally released on February 9, 2016, and posted at <https://www.arb.ca.gov/msprog/bus/busaxleweightlimit.pdf>. This appendix contains minor changes from the original posting.

California Law (enacted in 1975) prohibits transit operators from procuring buses over the gross axle weight limit of 20,500 lbs. on any axle. The gross axle weight is the weight when the bus is fully loaded including passengers. Many transit buses could not meet the weight limit but they continued to be purchased and operated in the State and went largely unnoticed. However, some local law enforcement agencies began to issue citations to non-compliant transit buses and the issue came to the forefront. The California Transit Association concluded that "...at least as many as half of the transit buses in California operating at peak commute times may exceed the state weight limit of 20,500 lbs. per axle."¹ A number of bills temporarily extended bus procurements provisions until a solution could be found. In 2012, Assembly Bill 1706, statutes of 2012, chapter 771, mandated new regulations to consider vehicle weight impacts and the ability of vehicle manufacturers or vehicle operators to comply with laws that limit the weight of vehicles. This paper addresses questions whether the zero emission bus purchase requirement in the proposed Innovative Clean Transit regulation would affect manufacturers meeting the California vehicle weight limits requirements.

On October 4, 2015, Assembly Bill 1250, statutes of 2015, chapter 484, was signed into law and changed the axle weight requirement in California. The bill amended Section 35554 of the vehicle code, and changed the definition of the weight limit on any one axle from the gross weight to curb weight. The curb weight is bus weight including maximum fuel, oil, and coolant, but does not include weight of passengers or the driver. The bill also modifies allowable weights as follows:

The curb weight of any axle of a transit bus (except articulated and zero emission buses) procured:

- January 1, 2016 through December 31, 2018 shall not exceed 23,000 lbs.
- On or after January 1, 2019 shall not exceed 22,000 lbs.

The curb weight of any axle for an articulated or zero emission transit bus procured:

- On Jan. 1, 2016 through December 31, 2017 shall not exceed 25,000 lbs.
- On Jan. 1, 2018 through December 31, 2019 shall not exceed 24,000 lbs.
- On Jan. 1, 2020 through December 31, 2021 shall not exceed 23,000 lbs.

¹ California Transit Association (2012). Letter to Governor Brown – AB 1706 (Eng) Bus Weight Limits – Request for Signature. September 6, 2012. Available: <http://caltransit.org/cta/assets/File/AB%201706%20Letter%20to%20Governor%20-%20California%20Transit%20Association.pdf>.

- On or after Jan. 1, 2022 shall not exceed 22,000 lbs.

Staff reviewed all twenty-one bus models with Altoona tests performed during 2011-2015. The buses include three battery electric buses, seven compressed natural gas buses, and eleven diesel buses. The results are shown in Table 1, where zero emission buses are shaded in gray. Both vehicle curb weight and the highest gross axle weight are shown in the middle columns. Table 1 also summarizes whether a bus meets the former 20,500 lbs gross axle weight limit or the new curb weight limit. The results show that only one bus met the former 20,500 lbs gross axle weight requirement (Number 14 - Blue Bird Body Company), but all buses meet the new 22,000 lbs curb weight requirement including the three zero emission buses. The New Flyer XE40 (Bus number 3) is currently 220 lbs over the 22,000 lbs limit that takes effect starting in 2019. Note that the Proterra battery electric bus (Number 2) has the lowest curb weight rating of all buses.

Table 1 - Altoona Test Results for Transit Buses Evaluated from 2011 to 2015

| Bus No. | Manufacturer | Model | Testing Start | Fuel Type | Highest Gross Axle Weight Rating (lbs) | Meets Former Gross Axle Weight Limit | Highest Axle Curb Weight (lbs) | Meets New Curb Weight Limit (AB 1250) |
|---------|------------------------|-------------------|---------------|------------------|--|--------------------------------------|--------------------------------|---------------------------------------|
| 1 | BYD Motors, Inc. | ebus | 4/25/2013 | Battery Electric | 25353 | No | 20890 | Yes |
| 2 | PROTERRA, Inc. | BE40 | 6/11/2014 | Battery Electric | 23840 | No | 15280 | Yes |
| 3 | New Flyer | XE40 | 6/24/2014 | Battery Electric | 28660 | No | 22220 | Until 1/2019 |
| 4 | New Flyer | XN60 | 12/19/2011 | CNG | 27760 | No | 20500 | Yes |
| 5 | New Flyer | C40LF | 2/20/2012 | CNG | 27760 | No | 21010 | Yes |
| 6 | Gillig, LLC | LOW FLOOR | 3/19/2013 | CNG | 27000 | No | 19590 | Yes |
| 7 | Nova Bus | CNG LFS 40 | 7/10/2013 | CNG | 27778 | No | 20910 | Yes |
| 8 | New Flyer | XN40 | 5/5/2014 | CNG | 27760 | No | 21500 | Yes |
| 9 | Motor Coach Industries | D4500 | 6/1/2015 | CNG | 22500 ¹ | No | 17220 ¹ | Yes |
| 10 | Designline USA, LLC | CNG 45' Coach | 11/9/2012 | CNG | 22400 ¹ | No | 17580 ¹ | Yes |
| 11 | Designline USA, LLC | Enhanced Electric | 5/13/2011 | Diesel | 27760 | No | 21730 | Yes |
| 12 | Prevost | X3-45 Commuter | 5/24/2012 | Diesel | 25500 ¹ | No | 17230 ¹ | Yes |
| 13 | New Flyer | XD40 | 9/6/2012 | Diesel | 27760 | No | 18980 | Yes |
| 14 | Blue Bird Body Company | All America FE | 12/5/2012 | Diesel | 19000 | Yes | 19220 | Yes |

| Bus No. | Manufacturer | Model | Testing Start | Fuel Type | Highest Gross Axle Weight Rating (lbs) | Meets Former Gross Axle Weight Limit | Highest Axle Curb Weight (lbs) | Meets New Curb Weight Limit (AB 1250) |
|----------------|-------------------------------|----------------|----------------------|------------------|---|---|---------------------------------------|--|
| 15 | North American Bus Industries | 40-LFW | 7/31/2013 | Diesel | 27760 | No | 21930 | Yes |
| 16 | Eldorado National | AXESS | 10/8/2013 | Diesel | 27760 | No | 20190 | Yes |
| 17 | Thomas Built | SAF-T-LINER C2 | 12/4/2013 | Diesel | 21000 | No | 12280 | Yes |
| 18 | EPV Corporation | Eco Coach | 7/15/2014 | Diesel | 22400 ¹ | No | 17370 ¹ | Yes |
| 19 | New Flyer | XDE60 | 9/11/2014 | Diesel | 27760 | No | 20750 | Yes |
| 20 | Alexander Dennis, INC. | E500 | 1/21/2015 | Diesel | 25353 | No | 16010 | Yes |
| 21 | Eldorado National | ARRIVO | 4/29/2015 | Diesel | 23000 | No | 15980 | Yes |

¹ Middle axle has highest gross axle weight rating (GAWR) and curb weight of these transit buses.

Reference List N

The following documents are the technical, theoretical, or empirical studies, reports, or similar documents relied upon in proposing these regulatory amendments, identified as required by Government Code, section 11346.2, subdivision (b)(3). Additionally, each appendix references the documents upon which it relies, as required by Government Code, section 11346.2, subdivision (b)(3).

Note: Each “Explanatory Footnote” is a footnote containing explanatory discussion rather than referencing specific documents relied upon.

1. California Transit Association (2012). Letter to Governor Brown – AB 1706 (Eng) Bus Weight Limits – Request for Signature. September 6, 2012. Available: <http://caltransit.org/cta/assets/File/AB%201706%20Letter%20to%20Governor%20-%20California%20Transit%20Association.pdf>.