Talgo Trainsets: An Excellent Choice for Midwest Corridors

The Talgo trains boast some exciting features not seen on current Amtrak trains that will result in:

- Faster, safer and smoother cornering, combined with better acceleration, resulting in faster trips.
- Reduced fuel and other operating costs.
- Interlocking technology that improves safety.

They are ideal for midwest service.
Faster in Curves

When the railroad was being built, many midwestern routes were designed to allow low-power locomotives to pull heavier loads. As a result, the track has a lot of curves, following meandering rivers to minimize grades at the expense of speed. Now, on every curve the wheels grind against the outer rail and the coaches lean out causing passenger discomfort.

Talgo’s unique design uses a combination of titling, steerable wheels and articulated car bodies to allow faster and safer speeds though curves. In fact, by using Talgo trains, the state of Washington cut ten minutes off the 187 mile Seattle–Portland trip.

Tilting

Airplanes and bicycles lean into a curve to balance the centrifugal force. Most trains, like automobiles, cannot do this on their own.

Talgo’s pendular (passive) tilting allows the car body to swing out around curves, much like a chair swing at a carnival, to reduce passenger discomfort at higher speeds.

Articulation

In a standard train, each car takes turns independently, exerting its own forces against the outer rail. Talgo’s articulated trains, where adjoining cars share a set of wheels, reduce the stresses to the roadbed as each car pulls the following car through the turn.
Steerable Wheels

The rigid, four-wheel trucks on conventional trains push hard against the rails in turns. They also tend to hunt back and forth in straight sections, creating a zig-zag motion and putting more strain on the track. Talgo’s unique individual steering wheels reduce these track forces by aligning each wheel to the track.

Better Acceleration and Lower Fuel Consumption

Lighter trains can accelerate and stop more quickly which translates into faster trips, reduced consumption fuel, and less wear-and-tear on the tracks.

Talgo trains, like most high-performance trains overseas, are built from aluminum extrusions welded together into what is essentially a corrugated aluminum box. The result is a stronger, but lighter-weight car body.

The wheels and trucks represent a large proportion of a train car’s weight. Also the turning weight in wheels has more momentum than other weight on the train. Talgo’s fewer wheels per seat results in a much lighter train.

A lighter train requires less pulling power, which means a lighter-weight locomotive can be used. Since locomotives are the heaviest part of the train, locomotive weight has a significant impact on train performance.

Operating Costs

Ongoing maintenance and operating costs are as important a factor as equipment capital costs, especially considering that trains can be in use for decades.

An independent study performed for several Midwestern states demonstrated that Talgo’s trains would be less expensive to operate and maintain.

Lighter, more aerodynamic Talgo trains will burn less fuel, one of the biggest cost drivers on passenger trains. A lighter train causes less wear-and-tear on the track, reducing on-going maintenance costs.
The ability to add and subtract cars to meet short-term demand fluctuations is often sited as an advantage to conventional trains, but this incurs additional switching costs. Also, modern trains have sophisticated electronics—which perform better if the train stays together as a unit.

**Safety**

Articulated trains like Talgo offer a huge advantage in safety, both for day-to-day users and by performing better in crashes.

Conventional cars overhang their trucks by 12’ 9”, this produces different overhang between two coupled cars when they enter curves or encounter rough track. As a result, the footplates are frequently misaligned. The misalignment causes a tripping hazard that can pop up in a fraction of a second. This effect is particularly dangerous for individuals using mobility aids.

In winter, passing between cars becomes more dangerous as snow and ice build up in the vestibules.

Articulated trains have no overhang at all, instead being connected at their extreme ends directly in line with the supporting truck. As a result, the footplates are always aligned, making passage between cars easier and safer. Additionally, since the cars always remain together, weather tight passages can be built, improving climate control within each car.

In the event of a collision, Talgo car ends, which have an asymmetrical (male/female) configuration, are designed to interlock at the top and bottom, greatly reducing the likelihood of any portion of the train turning over. This feature, combined with their shorter
Carbody length and lower center of gravity make the zigzag derailment of conventional trains much less likely.

The Talgo trains also offer new crash-energy management features, similar to crumple zones on automobiles, that today’s Amtrak trains do not feature.

**Accessibility**

At 30 inches, Talgo’s train floors are two steps lower than the 48-inch floors on Amtrak’s single level cars. Automatic retracting steps make boarding and alighting safer and easier, closing the gap between the train and the platform. Onboard lifts are available to those unable to climb steps. Once inside, the weather-tight passage ways allow wheelchair users to access the entire train.

Amtrak’s existing bi-levels have a 17-inch entry floor, but passengers face narrow stairways to reach the upper level and to pass between cars.

**Quick Delivery**

The newest cars in Amtrak’s Midwestern fleet are over 20 years old. The Horizon cars that make up the bulk of the fleet do not perform well in winter. New trains are urgently needed to meet the growing demand.

New bi-level cars are being constructed in Rochelle, IL to replace Amtrak’s fleet, but they won’t be available until 2016 or 2017. The two Talgo trains available for purchase are the only modern trains that can be delivered in the needed timeframe.

**Conclusion**

The Midwest is in the early stages of moving forward with higher-speed passenger rail service. Amtrak is now operating at 110 mph over sections of the Chicago–Detroit corridor and by the middle of this decade will also be running at 110 mph on the Chicago–St. Louis line. In addition to upgrading track and signal systems, we should now be designing and building the next generation of trains necessary to operate safely, efficiently and comfortably at these higher speeds.

High-capacity bi-level trains can be effectively used on shorter, straighter, high-volume routes. Nevertheless on longer routes with curves and changing track conditions, a new, lightweight, low profile, high-performance train is needed.

The Midwest High Speed Rail Association maintains a position of neutrality with regard to equipment manufacturers. We recognize, however, that Talgo is the only low profile, lightweight train currently available in North America.