Vehicle FAQ

This page is devoted to **frequently asked questions** (FAQ) related to vehicle application during moving-load analysis.

On this page:

- How is span length determined for vehicle axle-length effects?
- Which vehicle may be used for the optional deflection check per AASHTO LRFD 2007, Art. 3.6.1.3.2?
- How are truck definitions saved and applied to new models?
- How are vehicle loads applied according to Indian code?

How is span length determined for vehicle axle-length effects?

Extended Question: On the General Vehicle Data form, length effects may be specified for axle and uniform loads, but how is their span length determined?

Answer: Span length is determined for each individual response component from the shape of the influence line. Variability may exist among the span lengths calculated for response quantities, though the formulation is generally reliable, and meets the intention of requirements by using the portion of the lane which may be loaded.

Which vehicle may be used for the optional deflection check per AASHTO LRFD 2007, Art. 3.6.1.3.2?

Answer: Two options are available for this deflection check, including:

- The design truck alone, which the HSn-44 standard vehicle will serve.
- The design lane load with 25% of the design truck, which may be implemented by copying the HL-93K standard vehicle, then reducing the axle load by 75%.

How are truck definitions saved and applied to new models?

Extended Question: I use SAP2000 to perform moving-load analysis according to Canadian (S6-06) code. These standards are not available within the software, so I enter them manually. Is there a way to import these parameters, or have them available as a template for each new model?

Answer: Previously defined truck loads may be applied to another model using the following procedure:

1. Create a model (model A.sdb) which contains the definitions which will be applied to additional models.
2. Export the vehicle definition by selecting File > Export > SAP2000 .s2k Text File. Export only the following two tables:
    - Model Definition > Bridge Data > Vehicle Data > Table: Vehicles 2 - General Vehicles 1 - General
    - Model Definition > Bridge Data > Vehicle Data > Table: Vehicles 3 - General Vehicles 2 - Loads
3. Open the model (model B.sdb) into which the definition will be imported.
4. Import the definition by selecting File > Import > SAP2000 .s2k Text File. Be sure to select the option Add to Existing Model.

How are vehicle loads applied according to Indian code?

Extended Question: In addition to vehicle axle load, Indian code requires that a uniform live load of 5kN/m^2 cover the remaining lane surface, outside the vehicle footprint. This region includes the transverse portion between the vehicle and the edge of the lane. How is this done in SAP2000?

Answer: This loading configuration may be applied in SAP2000 using either of the following two methods:

- Reduce the magnitude and the width of the uniform load which acts along the length of the vehicle to match that required laterally between the vehicle and the edge of the lane. Apply distributed loading to the remaining portion of the lane.
- Reduce the axle loads by the resultant of the uniform load tributary to each axle within the footprint of the vehicle. This approach may be either conservative or unconservative, depending on whether concentrated or uniform loads govern response.