The LRV will be designed to minimize noise and vibration

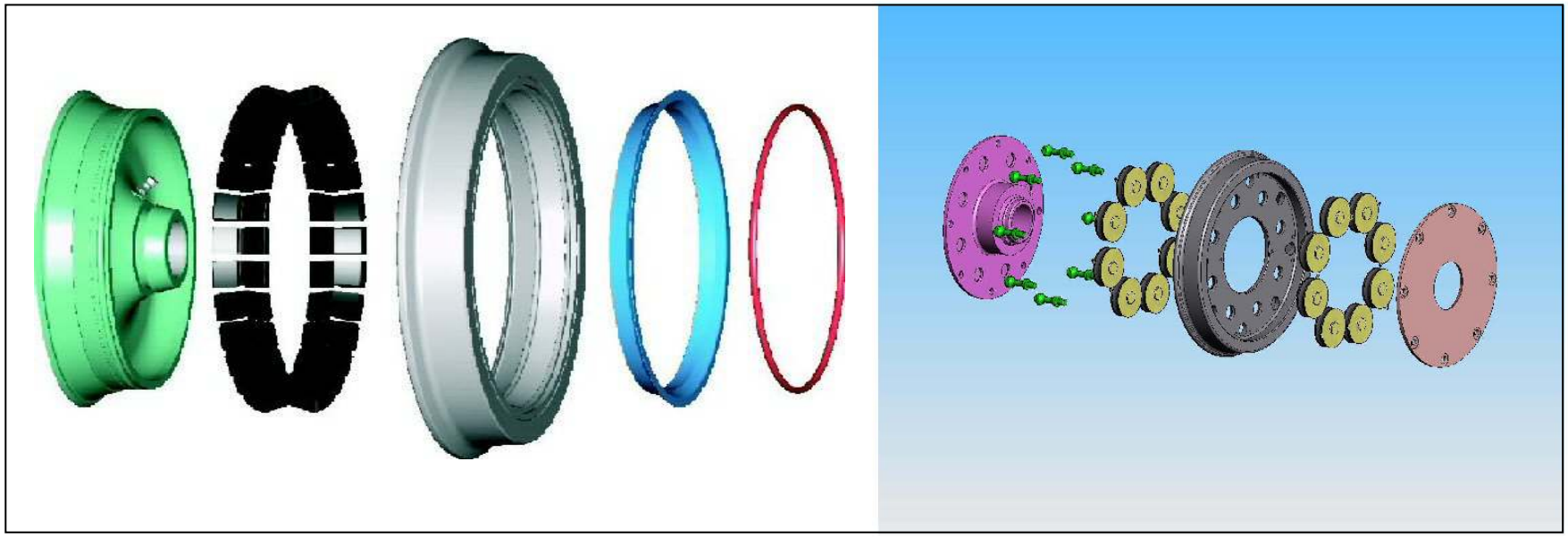
- The TTC will follow a comprehensive noise and vibration control plan.
- Specified noise and vibration levels will be achieved by careful selection, design, location, and installation of components on the LRV.
- Noise and vibration levels will be predicted with simulation software before the LRVs are built.
- The first three LRVs will be tested on Toronto streets for 9 months to ensure the established criteria has been achieved.
- Several components of the LRV will be designed to minimize noise and vibration. Some examples are listed below.

Vibration Reducing Components:
- Wheels
- Unsuspended Mass
- Suspension

Noise Reducing Components:
- Bogie Skirts
- Friction Modification System

Wheels

Typical Semi-Soft Wheel **Advanced Softer Wheel**

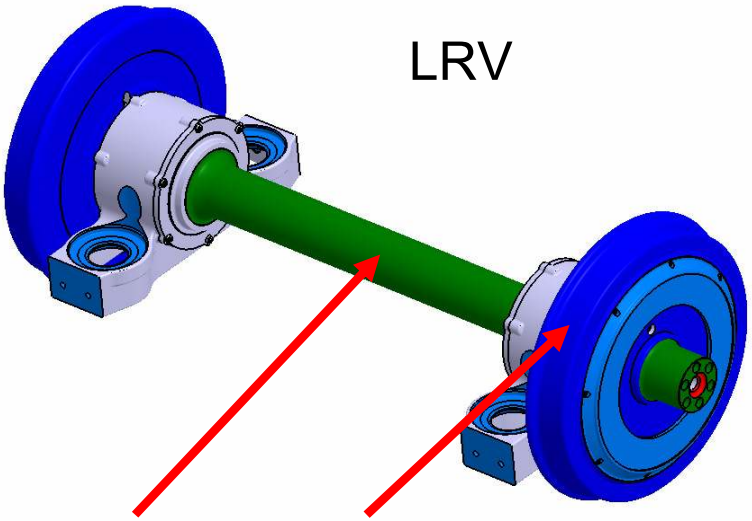


- Most rail vehicles use stiff wheels.
- Typical European LRVs use semi-soft wheels.
- TTC will use advanced softer wheels on the LRV.
- Softer wheels tend to transmit less vibrations into the ground than other wheel types.

Unsuspended Mass

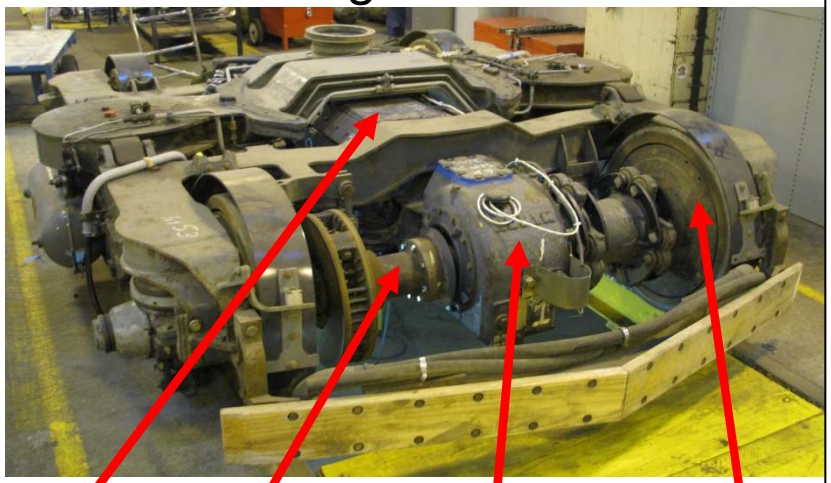
Unsuspended Components

LRV



Axle Wheel

Existing Streetcars



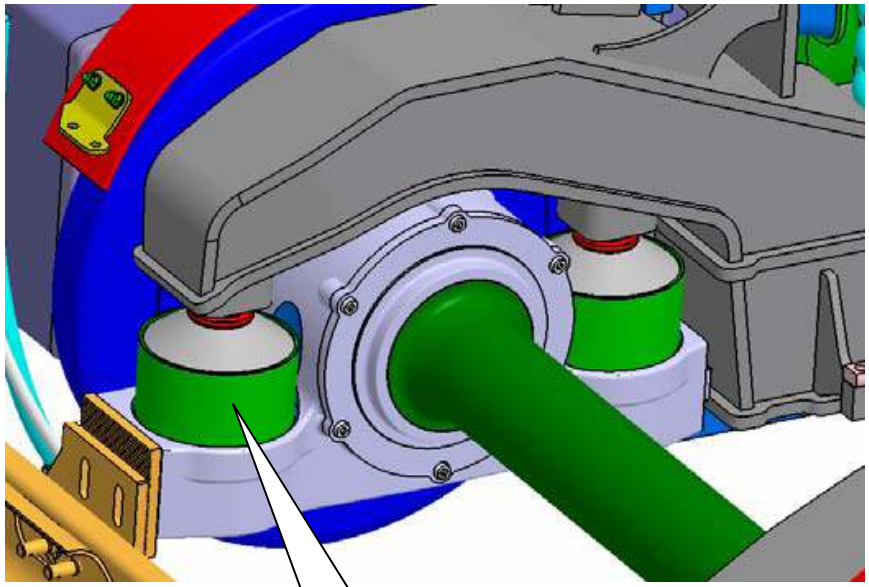
Motor Axle Gearbox Wheel

- The unsuspended mass is the mass of the components not carried by the suspension.
- The LRV is being designed to minimize this mass as it is the most predominant factor affecting ground borne vibration.
- Several heavy LRV components including motors and gearboxes will now be located above the suspension which reduces vibration.

Suspension

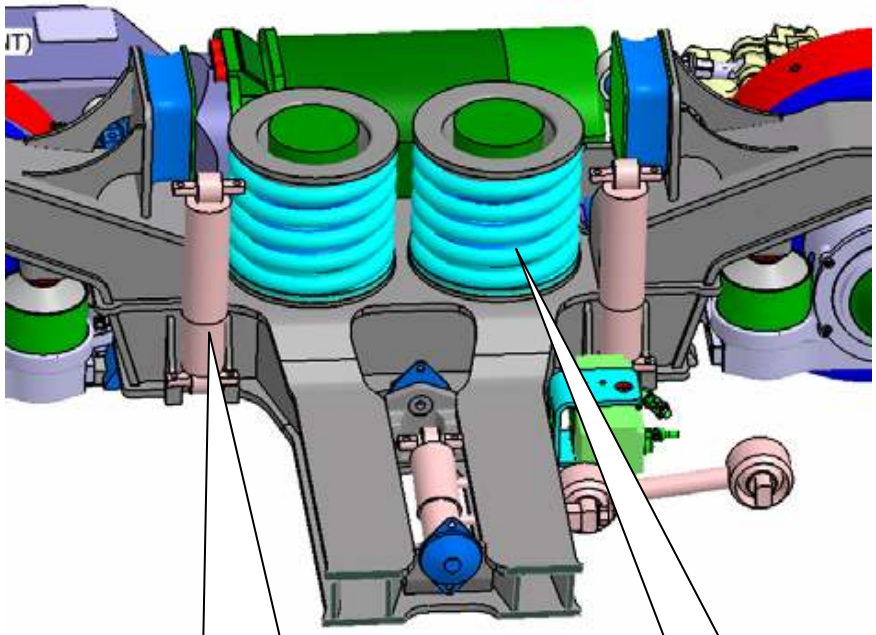
- In addition to softer wheels and reduced unsuspended mass, the LRV has two sets of suspension to minimize vibration.

Primary Suspension



Rubber Spring

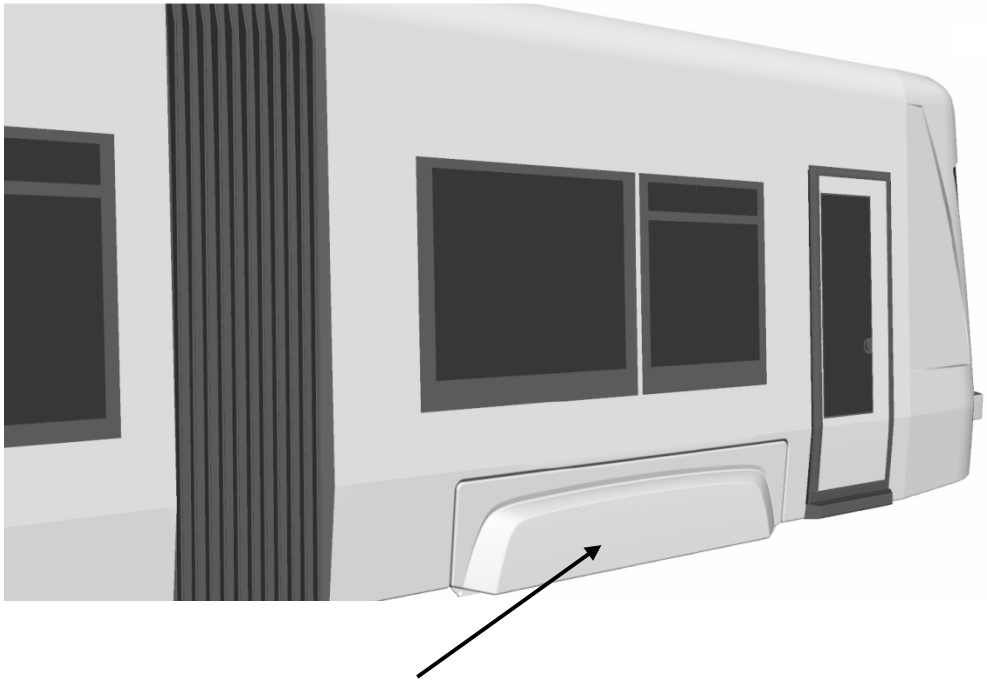
Secondary Suspension



Hydraulic Damper

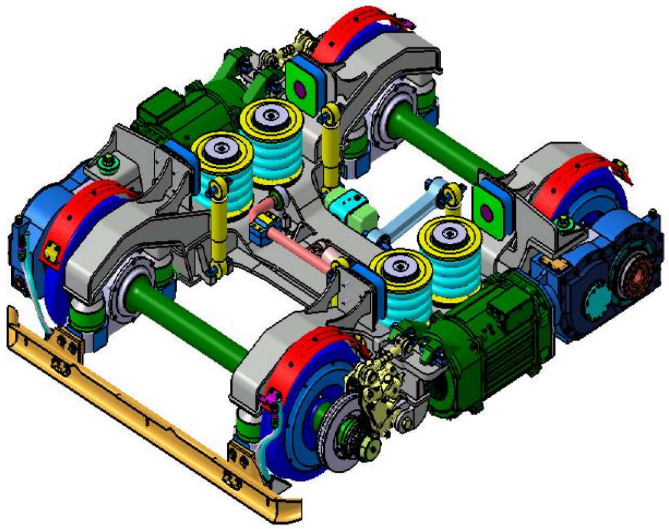
Coil Spring

Bogie Skirts



Bogie Skirt

Bogie skirts reduce wheel noise while improving safety and aesthetics.



Bogie

The bogie is the vehicle undercarriage. It uses two motors to drive four wheels on solid axles through gearboxes. It also contains suspension and brake components.