

LAB HOURS/ PROJECT STATUS

Recitation 11

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ESD.00

LIFE CYCLE ASSESSMENT OF TRANSPORTATION SYSTEMS: GOAL & SCOPE

- Components considered in this analysis

	Rail	LCA Type	Aviation	LCA Type
Vehicle	Manufacturing Operation Maintenance Insurance	Process Process Process & EIO LCA EIO LCA	Manufacturing Operation Maintenance Insurance	EIO LCA Process EIO LCA EIO LCA
Infrastructure	Construction Maintenance Operation Insurance	Process Hybrid Process EIO LCA	Construction Maintenance Operation Insurance	EIO LCA Hybrid Process & EIO LCA EIO LCA
Fuel	Production	Process	Production	Process

Adapted from Chester, "Life cycle Environmental Inventory of Passenger Transportation Modes in the United States," 2008.

LIFECYCLE INVENTORY OF RAIL – VEHICLE: MANUFACTURING

- Utilize EIO-LCA method (versus utilizing SimaPro software).
- Life cycle inventory equation set is then:

$$\frac{I/O_{EIO\text{LCA}}^{\text{rail,manufacturing}}}{\text{lifetime}_{\text{rail}}} = \text{Annual } I/O \text{ from Rail Manufacturing}$$

$$I/O_{\text{rail lifetime}}^{\text{rail,manufacturing}} = \frac{I/O_{EIO\text{LCA}}^{\text{rail,manufacturing}}}{\text{lifetime}_{\text{rail}}} \times \frac{\text{yr}}{VMT_{\text{system}}} \times \frac{VMT_{\text{rail}}}{\text{lifetime}_{\text{rail}}}$$

$$I/O_{VMT}^{\text{rail,manufacturing}} = \frac{I/O_{EIO\text{LCA}}^{\text{rail,manufacturing}}}{\text{lifetime}_{\text{rail}}} \times \frac{\text{yr}}{VMT_{\text{system}}}$$

$$I/O_{PMT}^{\text{rail,manufacturing}} = \frac{I/O_{EIO\text{LCA}}^{\text{rail,manufacturing}}}{\text{lifetime}_{\text{rail}}} \times \frac{\text{yr}}{VMT_{\text{system}}} \times \frac{VMT_{\text{rail}}}{PMT_{\text{rail}}}$$

Potential Data Sources:

<http://www.usitc.gov/publications/332/ITS-08.pdf>

LIFECYCLE INVENTORY OF RAIL – VEHICLE: MANUFACTURING (CONT)

The screenshot shows a web interface with three tabs at the top: 'Use Standard Models' (active), 'Create Custom Model', and 'Documenta...'. Below the tabs, there are two main sections:

- 1 Choose a model:**

Your current model is the **US 2002 Benchmark**, which is a **Producer Price Mo**
([Show more details](#))
US 2002 (428)
- 2 Search Results ([Back to all Sectors](#))**

Search for a sector by keyword:

Or browse for a sector below:

 - Rail transportation
 - Railroad rolling stock manufacturing
 - Scenic and sightseeing transportation and support activities f
 - Transit and ground passenger transportation
 - Services to buildings and dwellings
 - Commercial and industrial machinery and equipment rental a
 - Travel trailer and camper manufacturing
 - Truck trailer manufacturing

Photo: screenshot from eiolca.net, Green Design Institute

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