

## Simplified Life-Cycle Assessment, LCA.

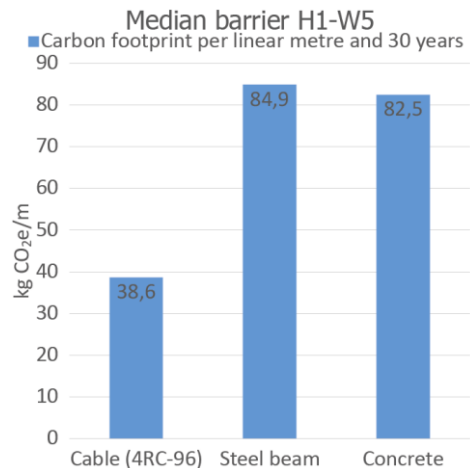
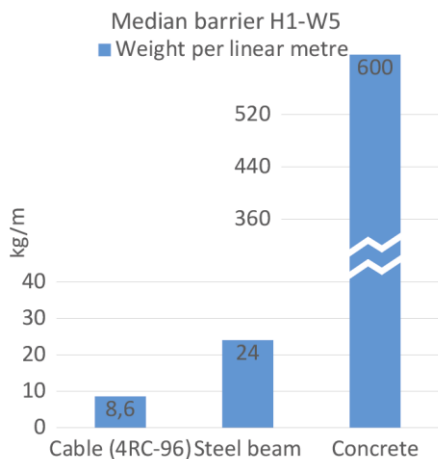
This document illustrates a simple, yet fairly comprehensive, LCA of median road median barriers divided into three common technologies.

Blue Systems' core idea throughout all of our product range is to create the best product possible using as little material as possible. This idea ensures a high effective, low cost and low environmental impact end product.

Typical repair ratios are: cable barriers 5 to steel beam barriers 1 whilst a typical steel beam repair activity imply the need of twice the time as well as twice the amount of workers and heavy machineries compared to a typical cable barrier repair activity. Concrete barriers are typically not in need of any repairs except for in extraordinary incidents.

### Carbon footprint per linear meter of median H1-W5 barrier over 30 years:

Investment/installation	Cable (4RC-96)	Steel beam	Concrete
Materials and processing	24,49 kg CO <sub>2</sub> e/m	67,96 kg CO <sub>2</sub> e/m	63,20 kg CO <sub>2</sub> e/m
Transport and installation	0,58 kg CO <sub>2</sub> e/m	1,17 kg CO <sub>2</sub> e/m	19,25 kg CO <sub>2</sub> e/m
Service and maintenance	Cable (4RC-96)	Steel beam	Concrete
Materials and processing	7,86 kg CO <sub>2</sub> e/m	13,33 kg CO <sub>2</sub> e/m	-
Transport and installation	3,91 kg CO <sub>2</sub> e/m	1,70 kg CO <sub>2</sub> e/m	-
Traffic queue	1,80 kg CO <sub>2</sub> e/m	0,70 kg CO <sub>2</sub> e/m	-
<b>Total LCA</b>	<b>38,6 kg CO<sub>2</sub>e/m</b>	<b>84,9 kg CO<sub>2</sub>e/m</b>	<b>82,5 kg CO<sub>2</sub>e/m</b>



#### Carbon emission conversion factors:

Plain steel	1 kg ~ 1,72 kg CO <sub>2</sub> e		
Processing of steel	1 kg ~ 0,88 kg CO <sub>2</sub> e	Freight	1 kgkm ~ 0,00019 kg CO <sub>2</sub> e
Hot dip (100 µm Ze)	1 m <sup>2</sup> ~ 6,2 kg CO <sub>2</sub> e	Diesel (installation)	1 l ~ 2,54 kg CO <sub>2</sub> e
Stainless steel	1 kg ~ 2,02 kg CO <sub>2</sub> e	Petrol (queue)	1 l ~ 2,36 kg CO <sub>2</sub> e
Processing of stainless	1 kg ~ 0,98 kg CO <sub>2</sub> e		
Plastics (PP)	1 kg ~ 1,975 kg CO <sub>2</sub> e	Conversion factors obtained from: IPCC GWP, Greenhouse Gas Protocol and environment consultant companies RSM&CO and Intertek.	
Processing of PP	1 kg ~ 1,25 kg CO <sub>2</sub> e		
Concrete (reinforced)	1 kg ~ 0,12 kg CO <sub>2</sub> e		