Observations on Life Cycle Costs in Nordic Road Tunnels

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In a broad context, Life Cycle Costs (LCC) include costs for construction, maintenance and repair, upgrading and operation. This study collects information on type of tunnel, building costs, expected service time, traffic intensity, reasons for and duration to maintenance and repair works. Repair works in tunnels are found to be performed due to need for extended tunnel profile, rock technical break-down (rock bolts and shotcrete) and damage of concrete or steel structures. Other reasons for maintenance include malfuction of technical installations such as fire extinguishing equipment due to expired life expectancy. By using LCC calculation theory, the most cost effective way of operating a tunnel may be established. The paper provides actual cost figures from a number of nordic road tunnels. This data can be used in LCC applications and support cost-effective planning and administration of the tunnels.