

# CANE PALKHI

Arvind Bhallamudi  
Intern, IDC School of Design, IIT Bombay  
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## Overview

To reduce the load on pilgrimage porters, Shenoy Innovation Studio at IDC School of Design in IIT Bombay had created a lightweight and durable palkhi made of stainless steel.

As an alternative material, 'cane' or 'rattan' was explored. This project was focused on its properties, the design and fabrication of a cane palkhi, and studying its viability.

## Team

Arvind Bhallamudi (Product design)  
Azrul and Faqrul (Local cane craftsmen)  
Prof. BK Chakravarthy (Project guide)

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## Vaishno Devi Pilgrimage

The Vaishno Devi temple attracts 10 million devotees every year. They undertake a steep trek of 12 km, which is highly strenuous, more so for those who are elderly and physically challenged. Hence, many prefer to be carried up in a palkhi (palanquin).

Carrying pilgrims on the palki is the main source of income for local porters. It can however, have serious effects on their physical health due to the concentrated load on their shoulders and back.



Conventional palkhi used at Vaishno-Devi pilgrimage

## Design Goal & Requirements

*A modern and sustainable palkhi to reduce the load carried by pilgrim porters*



### Lightweight

Reduce the load (currently 30-40 kilos per porter).



### Rigid

Sturdy enough to carry pilgrims across the long journey



### Durable

Sustain harsh weather and regular use in hilly terrain



### Eco-friendly

Non-polluting, naturally sustainable and easy to maintain

## Selecting a Suitable Material to Design the Palkhi

Cane is the fastest growing tropical wood, a naturally sustainable option.

Compared to other materials, cane is strong, durable, flexible and light-weight, making it an excellent choice for a wide range of applications.

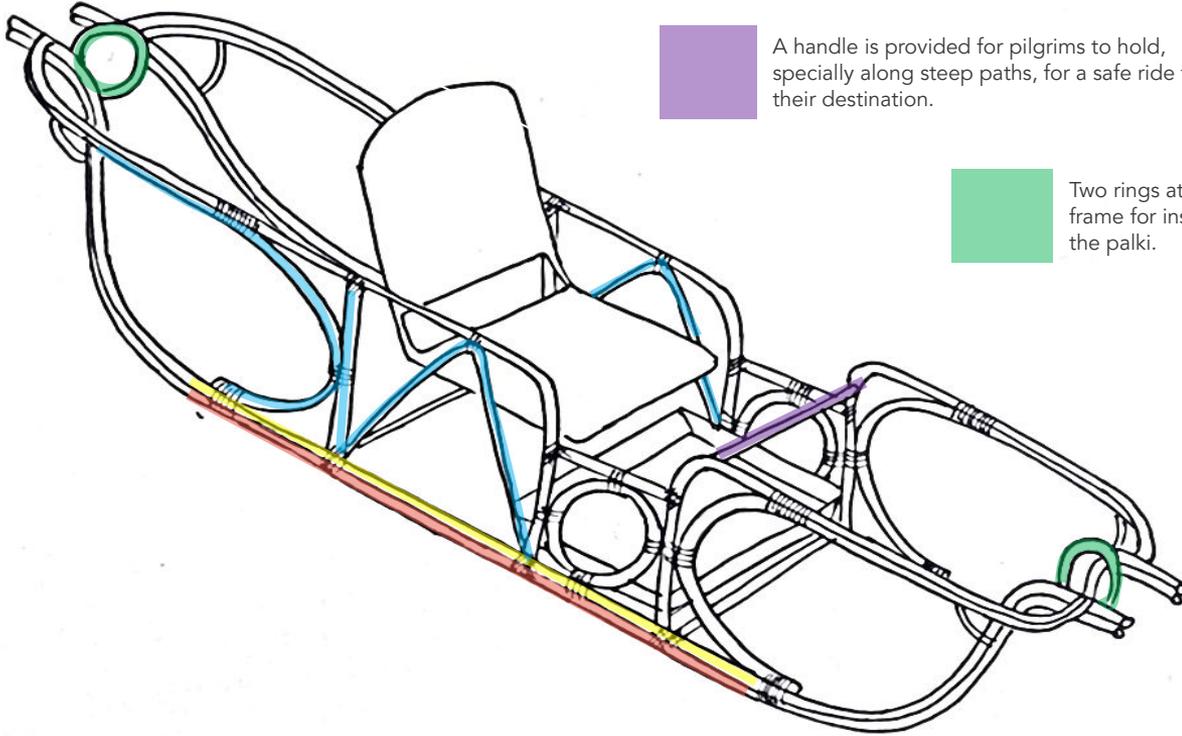


Supporting members are fixed at locations of high loading, such as near the seat, making the structure sturdy.

A handle is provided for pilgrims to hold, specially along steep paths, for a safe ride to their destination.

Two rings at the front and back are attached to the frame for inserting a thick wooden pipe to carry the palki.

Major members in the structure are doubled (later tripled) to reduce deflection and provide rigidity.



## Native Process

The palki was made in a nearby cane furniture shop by guiding two local craftsmen over a few weeks. The process of making cane products mainly consisted of five steps.



## Integration with Steel

The load was found to concentrate at joints near the rings at the front and back. This section was cut from a trial stainless-steel version, modified and then attached to the cane frame.



## Outcome

The project provided a wonderful insight into the complex interface and inter-relationship between design, materials and manufacturing.

The cane palki was found to weigh 20 kilos – 67% lighter than the original one used by the porters and 41% lighter than the stainless-steel version. Yet, it is rigid enough for practical use. It is also more environmental-friendly, and can be manufactured locally, contributing to skill development and job creation.

Currently, this palki is being used, not just in the Vaishno Devi circuit, but also at other places where porters work, like Elephanta Caves in Mumbai.

