

# EE2001 Project: Autonomous Straddling Bus

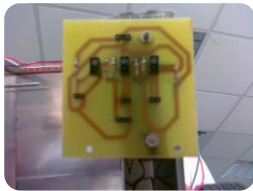
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## Overview

As city population grows, an innovative means of public transportation with high efficiency and large capacity is on call. Our project is inspired by a Chinese innovation named as Straddling Bus. The main feature is the structure of this new conveyor. The lower part is like a tunnel to let lower cars freely pass through, while people stand at the upper deck. Besides the novel structure, our project also features in its autonomous navigation system. Also, as far as the public transportation is concerned, safety precaution measures are indispensable. In our design, the bus is under control of the control station, where it can be communicated with mutually. Control station is also able to do tracking by receiving data from the bus at each station.



## Autonomous navigation system



The bus is able to navigate on the road autonomously. The road is constructed as white lines with black background, or vice versa. It makes use of 3 light sensors to detect the contrast and give feed back to processing system, where it does analysis and gives commands to motors, as any speed adjustment and steering is needed to perform. In spite of destructive disturbances, the whole system is approved as stable as a public transportation tool is required to.

## Control station system

It has two modes available. To start the bus, users can either set one of two predefined routes, or design the route manually for the bus. This attributes to high flexibility of route setting for the bus, as practically, road constructions and blockages are inevitable so that it needs to cope with different circumstances. Besides, the control is achieved in remote distance by using FM radio. The other main function control station performs is to track down the bus. This is important because it reflects back the location in real time, and gives time advantages to deal with abnormal situations such as bus breakdown, emergency and etc.



## Safety precaution measures

Special safety concerns arise with the novel structure of the bus. The height of cars passing through the bus is compromised. The maximized height allowed is set. And warning sign will be given if over height is detected. Moreover, cars underneath are prohibited to be too close to the bus side wall. If it is too close, warning will also be given. Also, if obstacles block the way in front, the bus will effectively stop with a safe distance.