



Nevada Transportation Conference

April 8, 2009

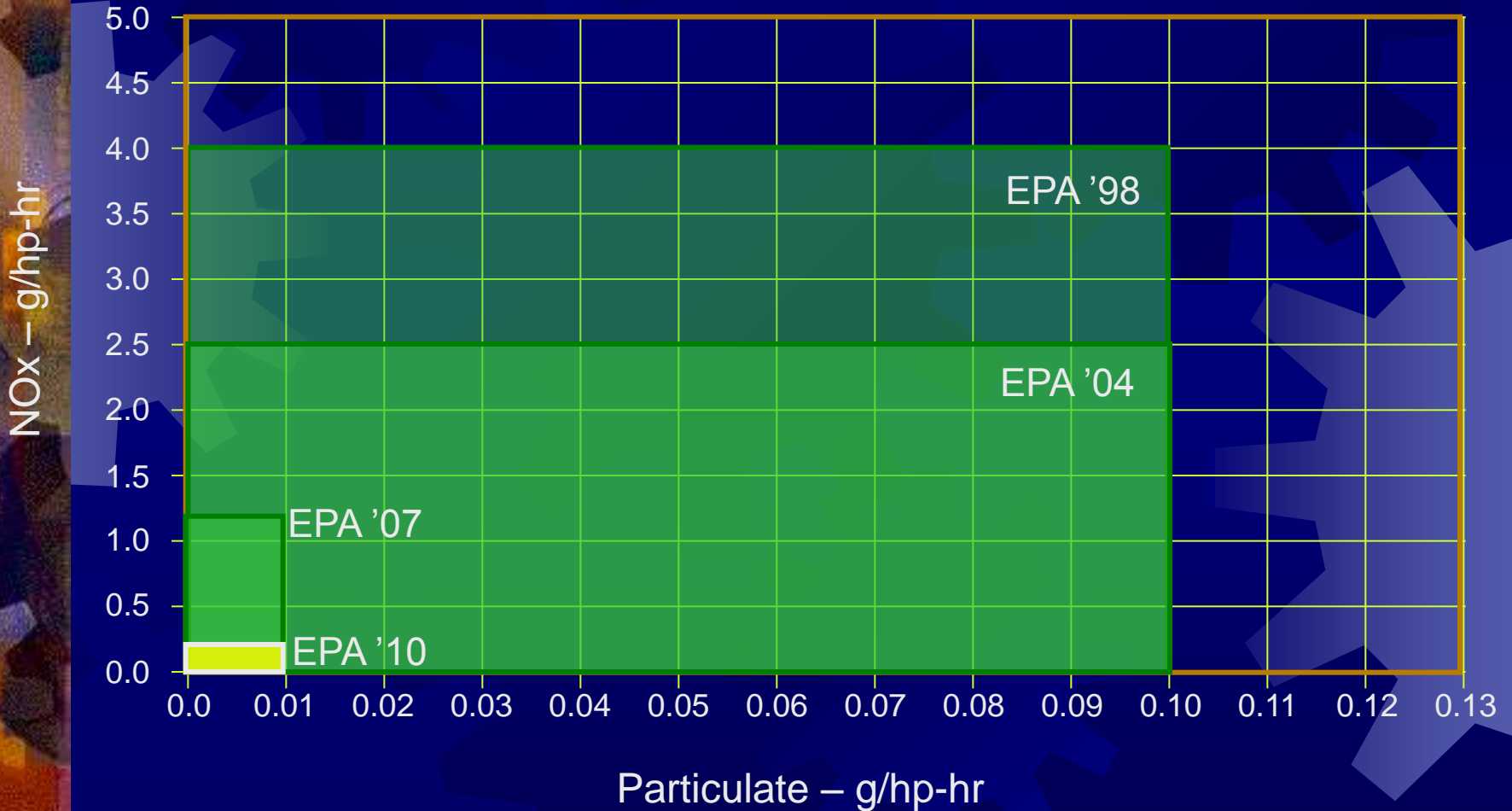
The Bus Technology Of The Future

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CTTRANSIT - First Transit

North America On-Highway Standards



Selective Catalytic Reduction Fundamentals

1

DEF Injection

- Small quantity of DEF injected
- Proportional to NOx rate
- 32.5% solution in water, freezing point = -11°C
- Stored in heated tanks
- $(\text{NH}_2)_2\text{CO}$

2

Hydrolysis

- DEF breaks down by hydrolysis to form ammonia
- NH_3

3

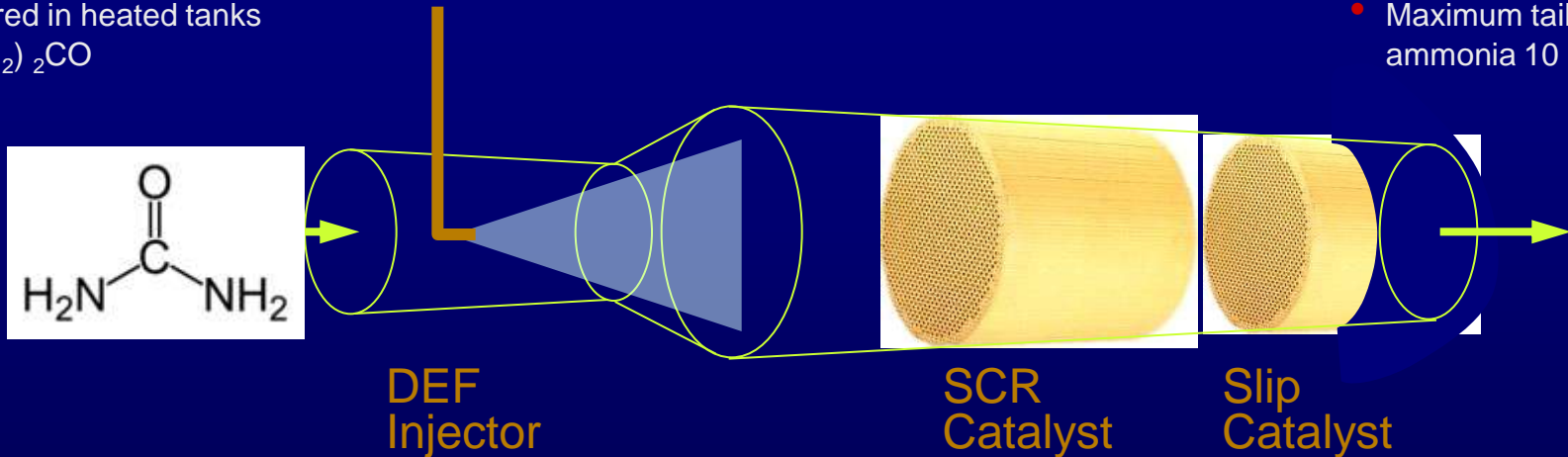
NOx Catalysis

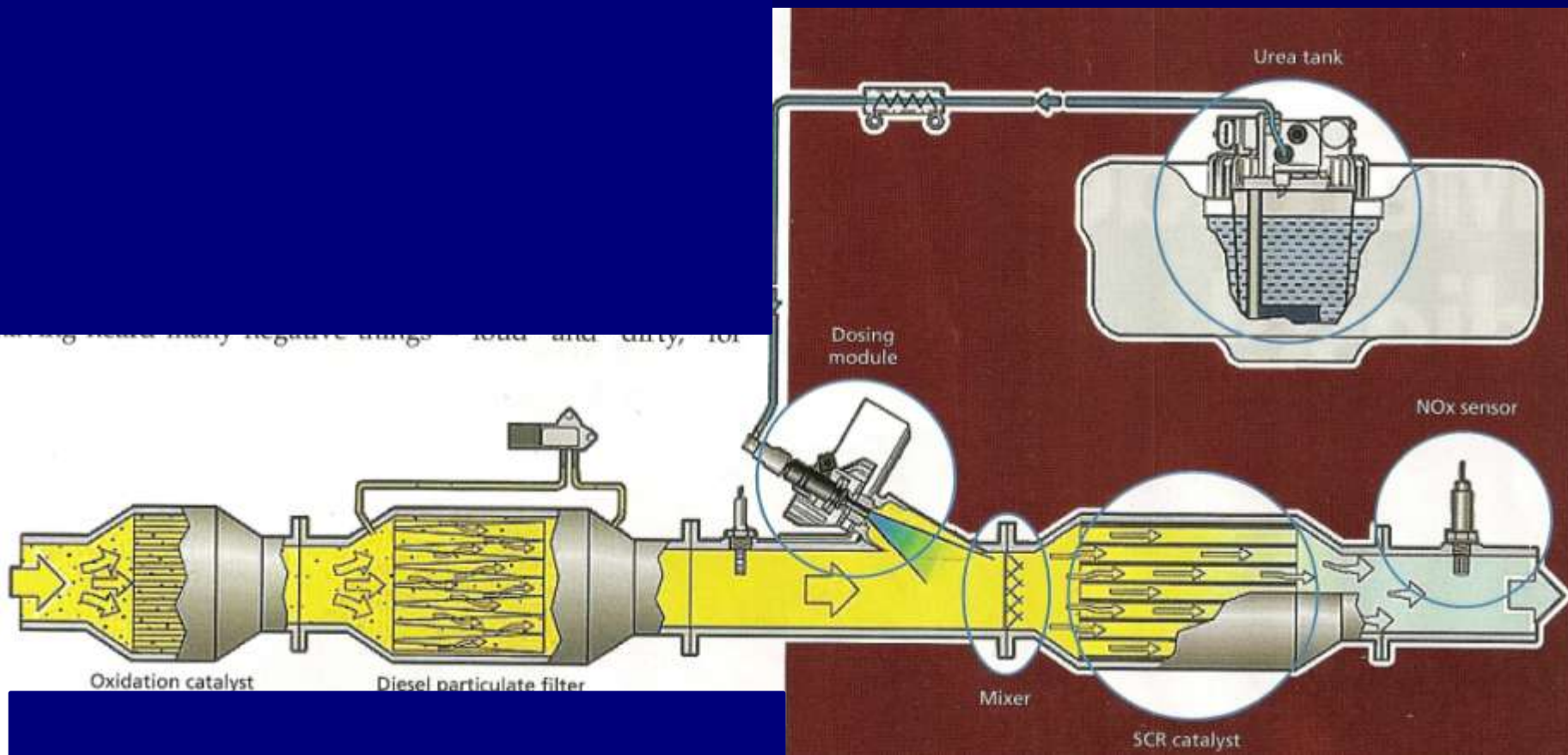
- NO and NO_2 react with ammonia over a catalyst to form nitrogen and water vapor

4

Ammonia Slip

- Any trace amounts of ammonia remaining after reaction with NOx are broken down to nitrogen
- Maximum tailpipe ammonia 10 ppm





Cummins Aftertreatment System

**Selective
Catalytic
Reduction (SCR)
Catalyst**

Particulate Filter



**Diesel
Exhaust Fluid
(DEF) Dosing
Valve**

What is the Bus Technology of the Future?



The Future is Green



Quiet Please!

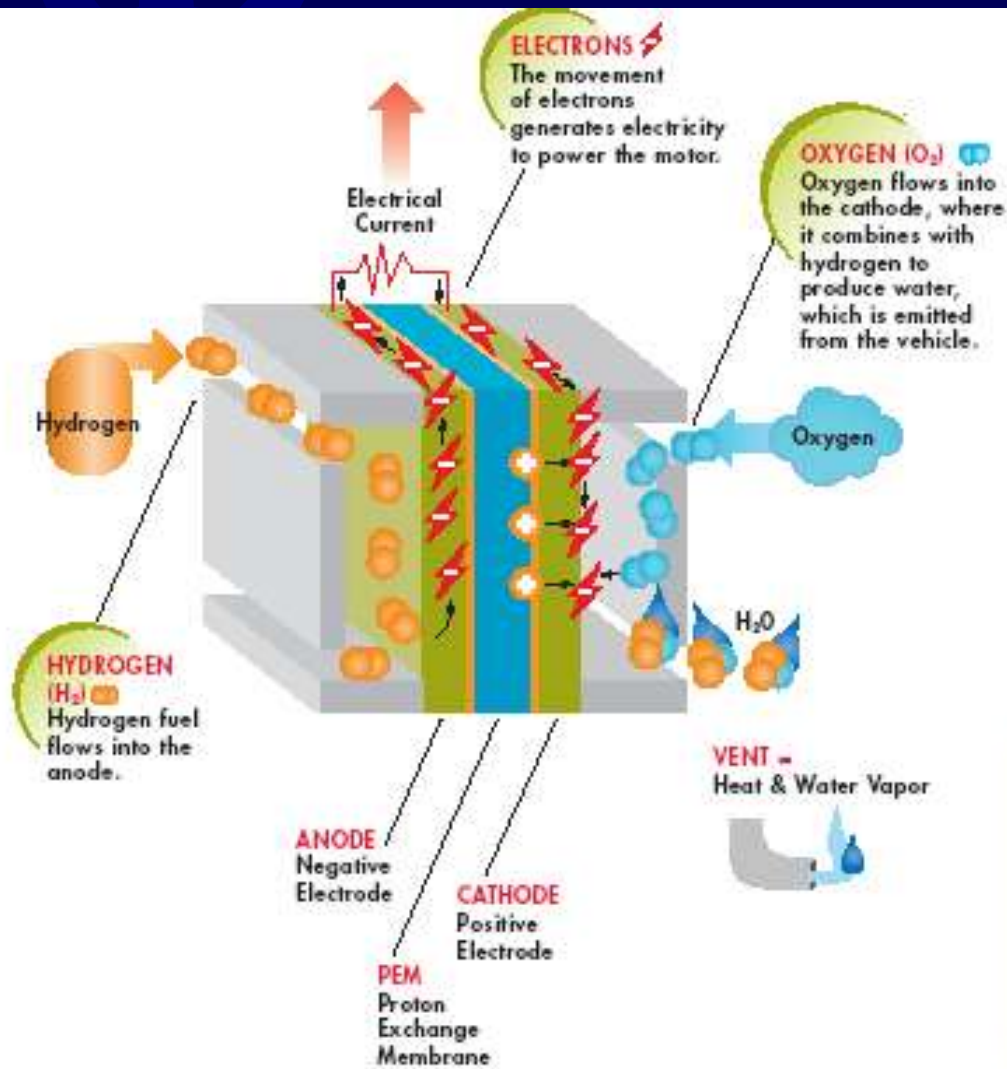




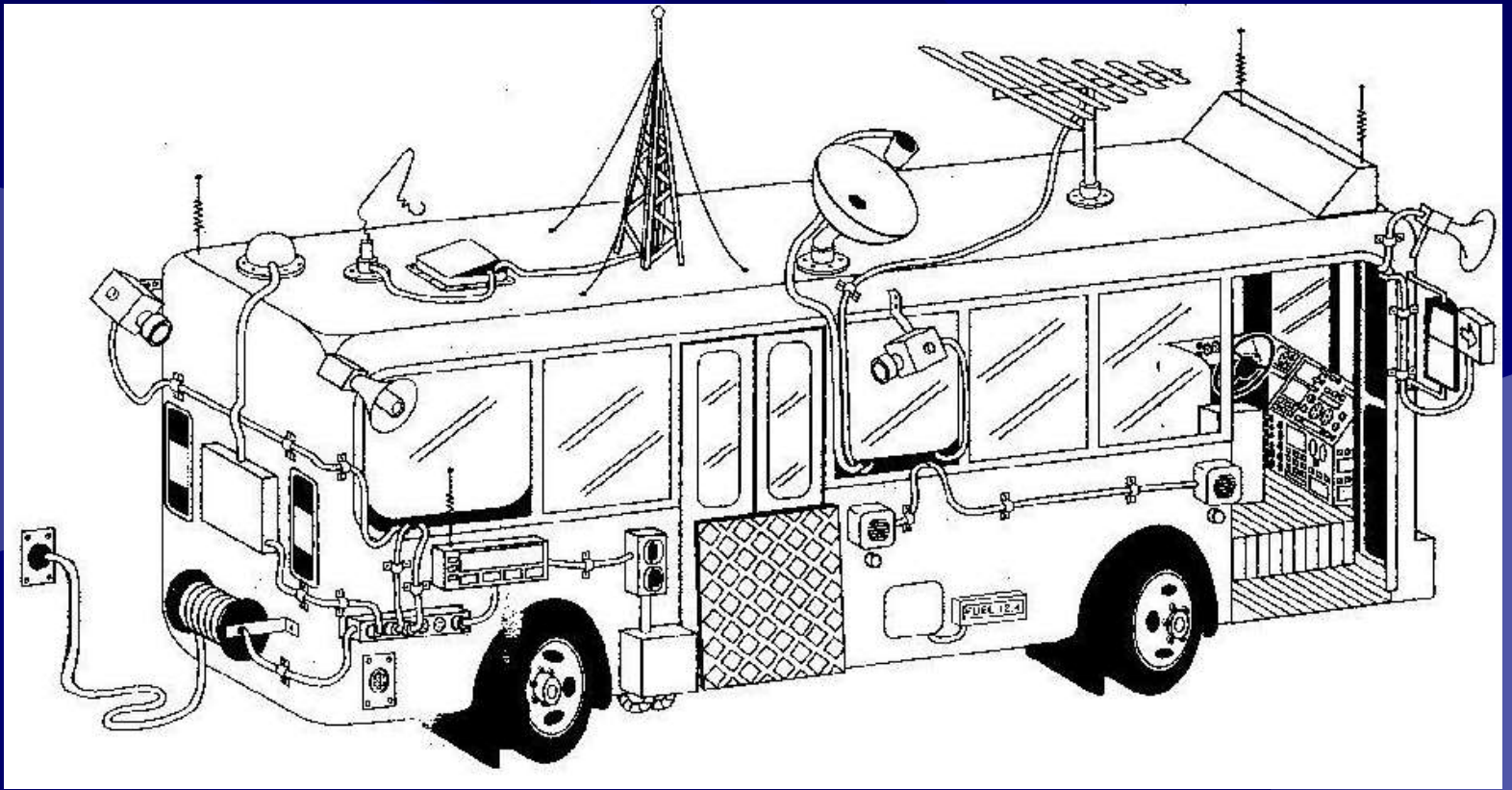
701 Zero Emission Hydrogen Fuel Cell Bus



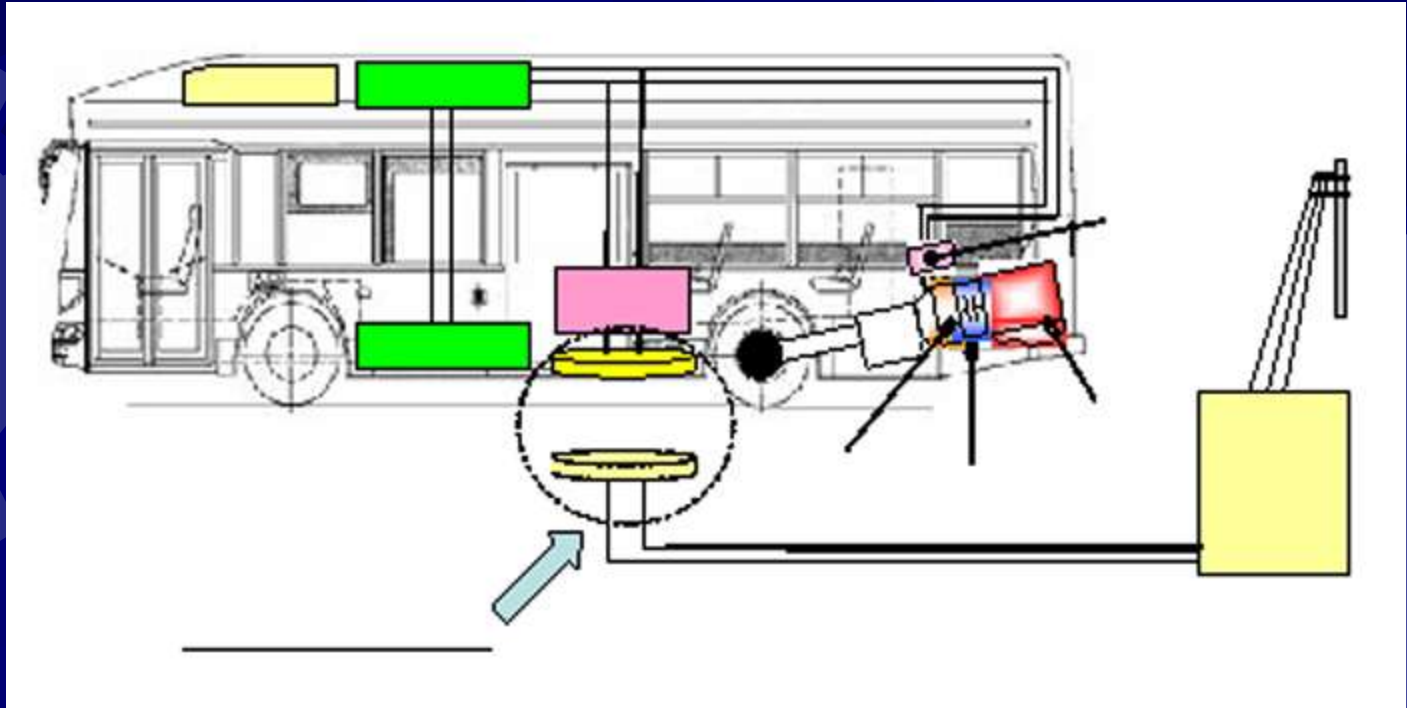
element
energy



Fuel cells also provide power to forklifts, airport tugs and even NASA's space shuttles. Large fuel cells can create electricity for houses and buildings. Tiny fuel cells can run laptop computers or digital cameras.



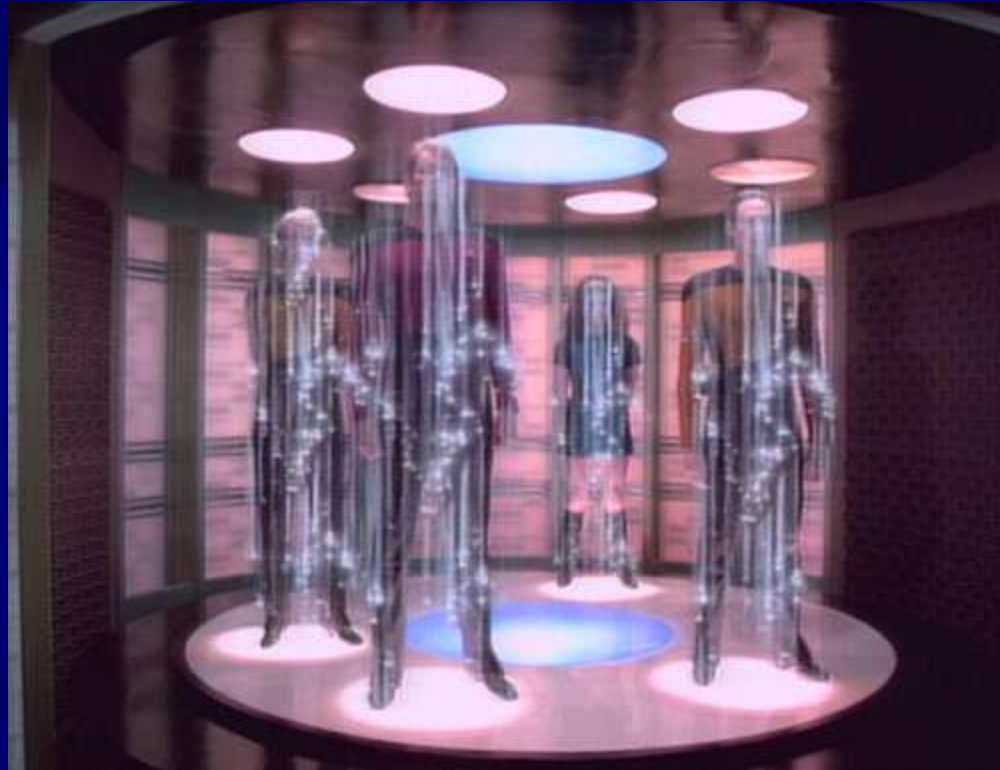




Bus Rapid Transit



Thank You



Live Long & Prosper