

## Long Range Fleet Planning: 2000-2003

2000 ARB Fuel path decision = Diesel path

- Flexibility to purchase any bus technology

BOS “11 Point Agreement” (clean up actions) and Independent Oversight Committee

2001-03 Alternative Fuel Pilot Program:

- Goal was to determine and formalize technology path for future bus procurements
- 2-year \$3.5M study: CNG, LNG, battery-electric, hybrid-electric; exhaust filters; and alternative diesel fuels
- Focus: Performance, Reliability, Emissions, Costs, and Safety
- UC Davis and UC Berkeley partnered in program design and study
- Results: SFMTA purchased 86 diesel-hybrid buses, installed Cleaire devices on remaining diesel buses, all buses fueled with local biodiesel blends



2001 Orion VI Hybrid

## Clean Air Plan – Zero Emissions 2020

2004 Partnership with SF Environment

### 3 Part Strategy:

1. Build on foundation: zero emission bus fleet
2. Purchase electric-drive bus technologies to replace conventional diesel buses
3. Clean up interim-remaining fleet with best available retrofit technologies and fuels



The “white handkerchief test”

## Advantages of Electric Drive Path

- Leverages existing TCs - the largest ZEB fleet in the U.S.
- Provides straight path to zero emissions – existing hybrid are upgradeable
- All zero emission buses ride on electric drive chassis:
  - The variable is the source of electricity:
    - Trolley bus
    - Battery bus
    - Fuel cell bus
    - Pixie dust...
- Compatible with existing SFMTA facilities
- Superior hill climbing performance
- Low noise levels
- Smooth ride (no gear shifts)
- Lifecycle costs comparable to conventional diesel buses



### Challenges:

*Today, added cost and low reliability factors inhibit 'shop floor' acceptance*  
*Emergency contingency vehicles must operate without electricity*  
*SFFD uses SFMTA diesel fuel tanks in emergency*

## Clean Air Plan: 2013 Status

- Largest zero emission bus (ZEB) fleet in U.S.
- Over 50% of SFMTA vehicles zero emission
- 5th largest hybrid-electric bus fleet in the U.S.
- Hybrid bus procurement “bridge” to ZEBs
- Cleaires (PM+NOx reduction) on all non-hybrid buses
- Largest municipal biodiesel fleet in U.S.
- Biodiesel blends in all diesel vehicles



- Two fuel cell bus pilot projects problematic