Travel Clean – Travel Green

Dipayan Dey
South Asian Forum for Environment [SAFE]
Institutional Background

• South Asian Forum for Environment [SAFE] works at the science society interface towards sustainable development goals in the Indian Ecoregion.

• SAFE envisages global partnership and local participation to ensure equity and reciprocity for the bio-rights of commons.
### Activity Areas & Partners of SAFE

**UN Organs**
- UNEP, UNDP, UNHABITAT, UNESCO, UNFCCC, UNIDO, World Bank

**International Partners**
- DFID, USAID, APN-GCR, ICIMOD, IWMI, NASA, IUCN, IAIA, GEF, GCF, Earthwatch,

**National Partners**
- Mo EF&CC, MNRE, 12 ULBs, MoC, NABARD, NWM,

**Corporate partners**
- HSBC, PwC, IBM, DLF,

**CSO partners**
- 27 national and international CSO,
- 12 CBOs & 04 IPOs
Sustainable Transport...
Our Issues & Concerns
57% of air pollution is due to motor vehicles
- Emission of GHGs and SPM (1.1 micron)
- 73.2% vehicles run on diesel or kerosene-mix-oils
- Average age of vehicles in public transport is 14 years
- Every 4th person suffers from respiratory tract diseases and asthma
- Increase in road-noise (peak-hours) is 16.6%
Non-sustainable usage: Many – One Dilemma

• Increasing private automobiles for point-to-point movement is decreasing urban carrying capacity
• Swelling load on rural vehicles for limited public transport options is deteriorating air quality in rural.

Variation in annual rates of vehicles registration in Kolkata

<table>
<thead>
<tr>
<th>Year</th>
<th>Public Vehicles</th>
<th>Private Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-01</td>
<td>3.00%</td>
<td>5.00%</td>
</tr>
<tr>
<td>2001-02</td>
<td>3.50%</td>
<td>5.50%</td>
</tr>
<tr>
<td>2002-03</td>
<td>4.00%</td>
<td>6.00%</td>
</tr>
<tr>
<td>2003-04</td>
<td>4.50%</td>
<td>6.50%</td>
</tr>
<tr>
<td>2004-05</td>
<td>5.00%</td>
<td>7.00%</td>
</tr>
<tr>
<td>2005-06</td>
<td>5.50%</td>
<td>7.50%</td>
</tr>
<tr>
<td>2006-07</td>
<td>6.00%</td>
<td>8.00%</td>
</tr>
<tr>
<td>2007-08</td>
<td>6.50%</td>
<td>8.50%</td>
</tr>
<tr>
<td>2008-09</td>
<td>7.00%</td>
<td>9.00%</td>
</tr>
<tr>
<td>2009-10</td>
<td>7.50%</td>
<td>9.50%</td>
</tr>
<tr>
<td>2010-11</td>
<td>8.00%</td>
<td>10.00%</td>
</tr>
<tr>
<td>2011-12</td>
<td>8.50%</td>
<td>10.50%</td>
</tr>
</tbody>
</table>
• Per capita travel space shrinking in unsustainable public transport. Travel comfort Safety is compromised.
• Road space per unit automobiles is increasing. Habitat health and commuters time is compromised.

<table>
<thead>
<tr>
<th>Road</th>
<th>Avg Speed</th>
<th>Road length</th>
<th>Cars in more peak</th>
<th>Cars in avg peak</th>
<th>Total hours lost</th>
<th>Value of lost time (Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC Mallick Road</td>
<td>16</td>
<td>4</td>
<td>2678</td>
<td>2487</td>
<td>878.05</td>
<td>16682.95</td>
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<tr>
<td>MG Road</td>
<td>9</td>
<td>3</td>
<td>1507</td>
<td>1599</td>
<td>848.97</td>
<td>16130.49</td>
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<tr>
<td>AJC Bose Road</td>
<td>18</td>
<td>6</td>
<td>1915</td>
<td>1851</td>
<td>803.41</td>
<td>15264.85</td>
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<tr>
<td>CR Avenue Road</td>
<td>25</td>
<td>4</td>
<td>2028</td>
<td>2112</td>
<td>331.2</td>
<td>6292.80</td>
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<tr>
<td>Deshpande Sasmal Rd</td>
<td>15</td>
<td>2</td>
<td>1693</td>
<td>1848</td>
<td>330.49</td>
<td>6279.37</td>
</tr>
<tr>
<td>JL Nehru Road</td>
<td>25</td>
<td>3</td>
<td>2237</td>
<td>2246</td>
<td>268.98</td>
<td>5110.62</td>
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<tr>
<td>RG Kar Road</td>
<td>18</td>
<td>2</td>
<td>1397</td>
<td>1415</td>
<td>199.96</td>
<td>3799.32</td>
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<tr>
<td>Lenin Sarani</td>
<td>20</td>
<td>2</td>
<td>1042</td>
<td>1225</td>
<td>136.02</td>
<td>2584.38</td>
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<tr>
<td>Jatinind Mohan Ave</td>
<td>20</td>
<td>1</td>
<td>1390</td>
<td>1407</td>
<td>83.91</td>
<td>1594.29</td>
</tr>
<tr>
<td>Vivekanand Road</td>
<td>40</td>
<td>1.2</td>
<td>1202</td>
<td>1768</td>
<td>178.2</td>
<td>338.58</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17089</strong></td>
<td><strong>17958</strong></td>
<td><strong>3898.82</strong></td>
<td><strong>74077.66</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Study by Centre for Urban Economic Studies, Calcutta University*
Gaps in Policy & Implementation

- No policy for introducing electrical vehicles
- No incentives for green fuel / renewable energy
- No mandates for shared travels / pool cars
- No limits in public vehicle registration system
- No efficient vehicular pollution monitoring system
- No improvement in public transportation system
Our Concerns in Sustainable Transport Issue...

- Equitable access to all
- Affordable for all
- Safety for all goers
- Habitat is safe
- New-energy prodigy
Our Achievements in Sustainable Transport
Policy Implications

- Ban on polluting urban Autos – bringing in CNG and Battery-run vehicles in Kolkata
- Rehabilitating the electrical Tram car in Kolkata
- ‘Chakra Satyagraha’ – a mass campaign against blanket ban on cycles in Kolkata
Planning Green Rides with ‘TOTO’
A Heritage Travel with Tram
Chakra Satyagraha
Non-violence on wheels

Why this CycleBan?
Takes 5 Times Less Space: De-Congest

Car  Cycle & NMT  Public Trans

Safe & Smart
Kolkata
Health | Air
Money | Joy

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SAFE

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South Asian Forum for Environment
Awareness Generation

• First Strategic EIA on transport system in Kolkata published in Green Interpreters (ISSN

• First Emission foot printing of engine-boats in Sundarbans (Reported in TOI dated 25th June 2010)

• First C40 Smart City Conference with US Consulate in Kolkata on Sustainable Transport

• School awareness campaigns on ‘NO HONKING, NO POLLUTION’

• Side Event in COP21 Paris – on Electrical Cities and Sustainable Transportation
Street Campaigns with School Students
Innovations: ASSIST
Aqua-Solar Systems for Integrated & Sustainable Transport
SAFE

MAIN FLOAT SUPPORTING THE PV MODULE
HDPE material
Inclination Angle: 12°
Thickness: ~3 mm
Weight: 9.5 Kg

SECONDARY FLOAT FOR MAINTENANCE/BUOYANCY
HDPE material
Non-slipping surface
Thickness: ~3 mm
Weight: 3.5 Kg

STANDARD FRAMED 60 CELLS PV MODULE
Length: max 1670 mm
Width: 991 mm ± 3
Frame thickness: 25~40 mm
Cable length: 900~1200 mm
Connector: MC4 compatibility

CONNECTION PIN
Fiberglass + PP material
Certification NFT 58 000

RAIL TO FIX THE PV MODULE ON THE FLOATS
Aluminium or EPDM rail
Certificated ISO 3302-1/1996

Mail: safeinch@gmail.com
Phone: +91 33 24329699

South Asian Forum for Environment
Comparison Floating PV & Overland PV

➢ Floating solar panels (Blue) having 10.3% more efficient than overland system.

**Fig.: Comparison Graph**
Challenges in Implementation

1. Strengthening Technology for sustainable growth in rural areas
2. Resource convergence for financing innovations in Sust. Transport
3. Incentivizing new energy usage for rural public transport system
4. Awareness on benefits over cost implications in using solar vehicles
Future program for scale and impact:
5Es of Sustainable Transport

Emission Reduction
Economic Sustainability
Ensuring Safety
Empowerment
Energy Prodigy
Impacts & Future Programs

**Awareness Campaign for Attitude Change**
- Educating transport sector stakeholders, owners and dealers
- Action research at science-society interface for commuters

**Save Sundarban Habitat with ASSIST**
- Technology cooperation for more economic new-energy prodigy
- Elimination of emitting vehicles to save the habitat from pollution
- Awareness drive for safe and smart travel

**Sustainable Transport in Climate Smart Cities in India**
- Promote clean fuel and green energy in city transport system
- Use science communication for traffic management and road safety
- Advocacy for sustainable transportation, shared travel, car pool
Travel green to travel far with this planet...

Thanks