

FP7. Transport Information Days



Name of the Organisation, Country	New Style Technology (NST), Israel
Fields of Activity	Research of transport problems: manoeuvrability, safety and a parking of vehicles, use of kinetic energy of vehicles. The owner of 50 inventions and patents.
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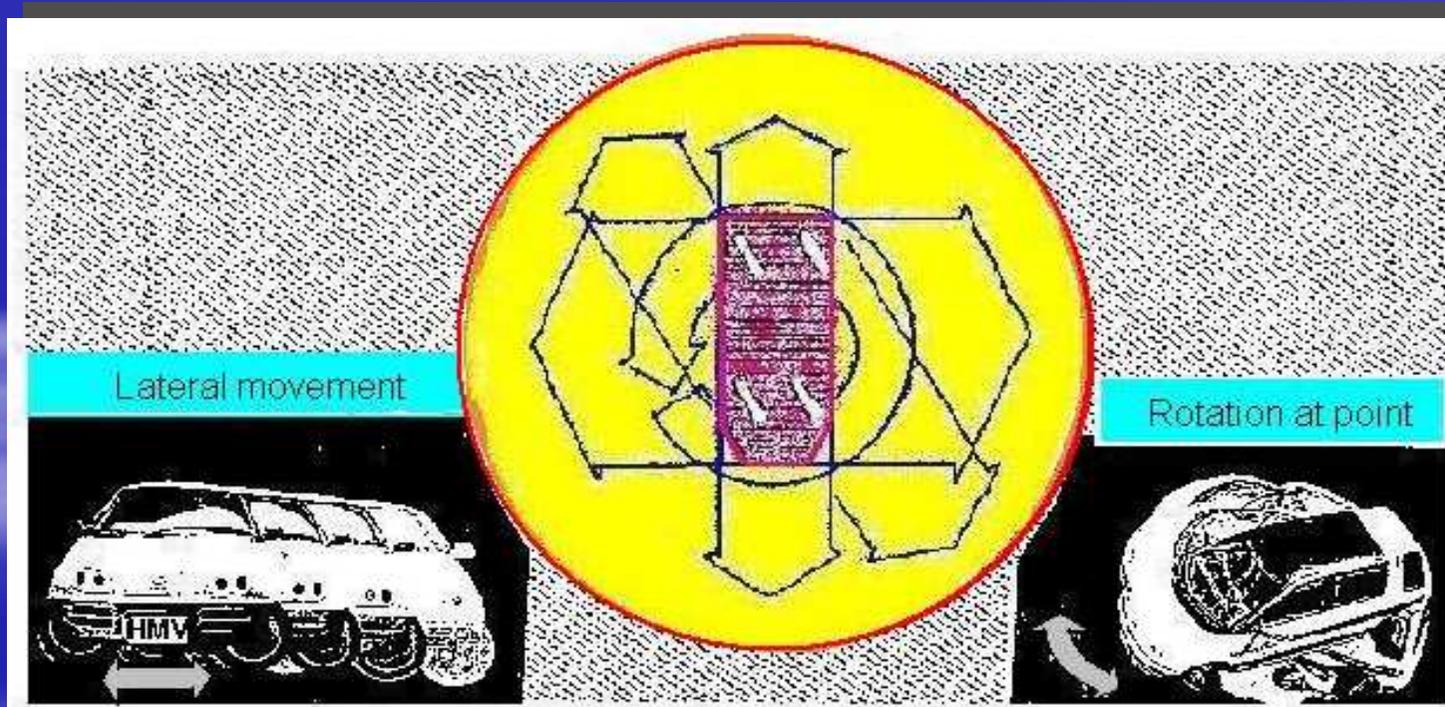
Project Proposal Title 1	Highly Maneuverable Vehicles & Effective Urban Transport
Call Identifier 1	THE EUROPEAN GREEN CARS INITIATIVE
Topic 1	GC.SST.2013-3. Future light urban electric vehicles

1. Highly Maneuverable Vehicles & Effective Urban Transport



Objective of this proposal

The Project aim is a development of an Highly Maneuverable electric car for an effective passenger urban transport.



1. Highly Maneuverable Vehicles & Effective Urban Transport



The idea of NST

We have developed an innovative steering system, what kinematically connected with the four swivel wheels. This system will provide a new functions maneuvering to electric car, namely:

- Maneuvering with any radius of curvature in the longitudinal and transverse directions, including rotation at point;
- Flat-parallel motion in any direction, including the lateral direction.

This significant increase in mobility is a vital quality for urban transport and provide to highly maneuverable electric car (compared to existing vehicles) the following benefits:

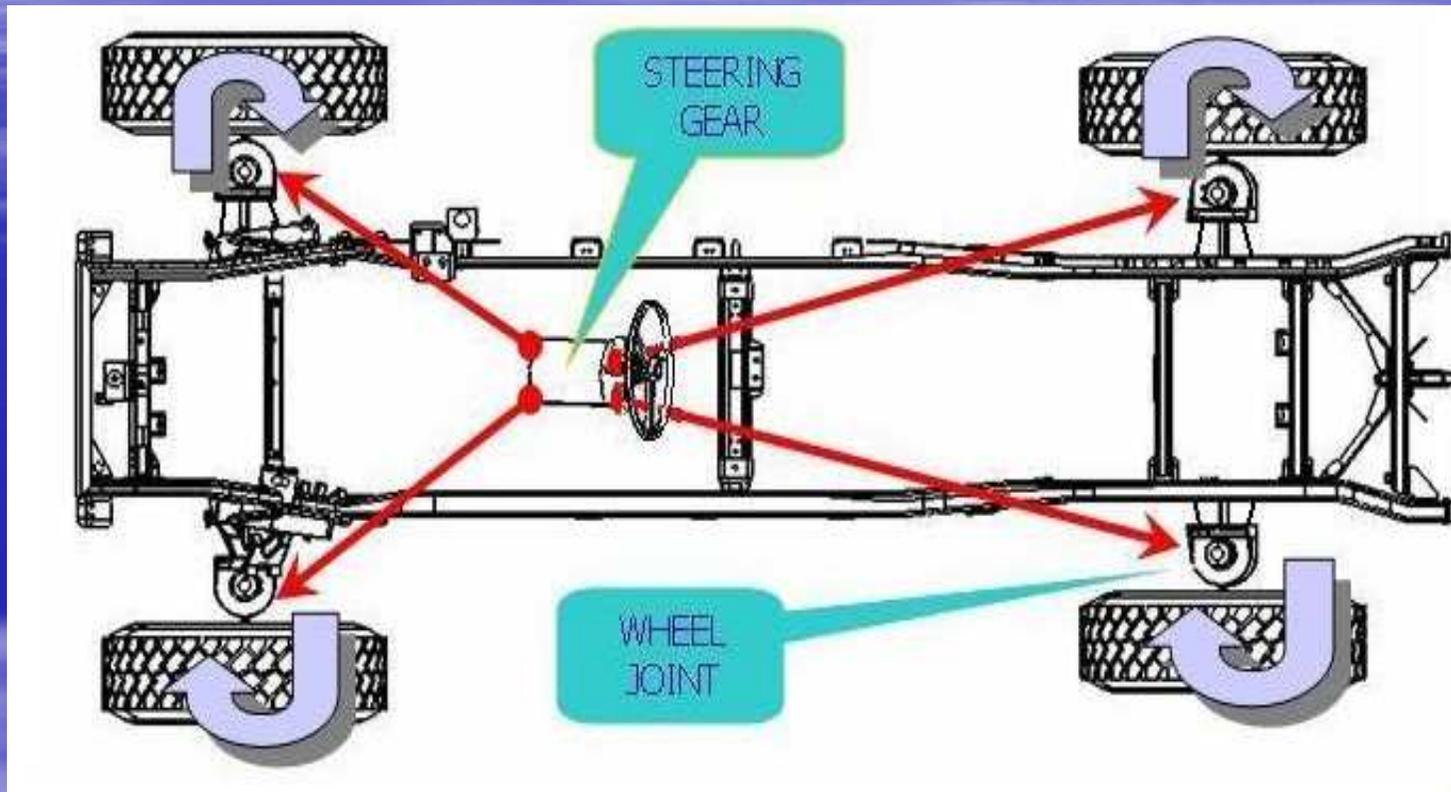
- Economy of area, time and energy at a parking;
- Increased power efficiency, comfort and accessibility to passengers (especially older people and people with disabilities);
- Increase of safety and course stability at maneuvering on road;
- Ecological cleanliness and neutral influence on a climate;
- Compact placing of such electric cars on roll stock points and power supply points.

NST offers the use of such highly maneuverable electric vehicles as an effective urban transport. This is largely will ensure the achievement of the goals of the European green cars Initiative.

1. Highly Maneuverable Vehicles & Effective Urban Transport



The scheme of HMV steering system



The capabilities of the gear includes:

Turn of four wheels through any angle ($\pm 120^\circ$)

Maneuvering of vehicle with any curvature radius, including rotation at point

Flat-parallel maneuvering in any direction, including lateral movement

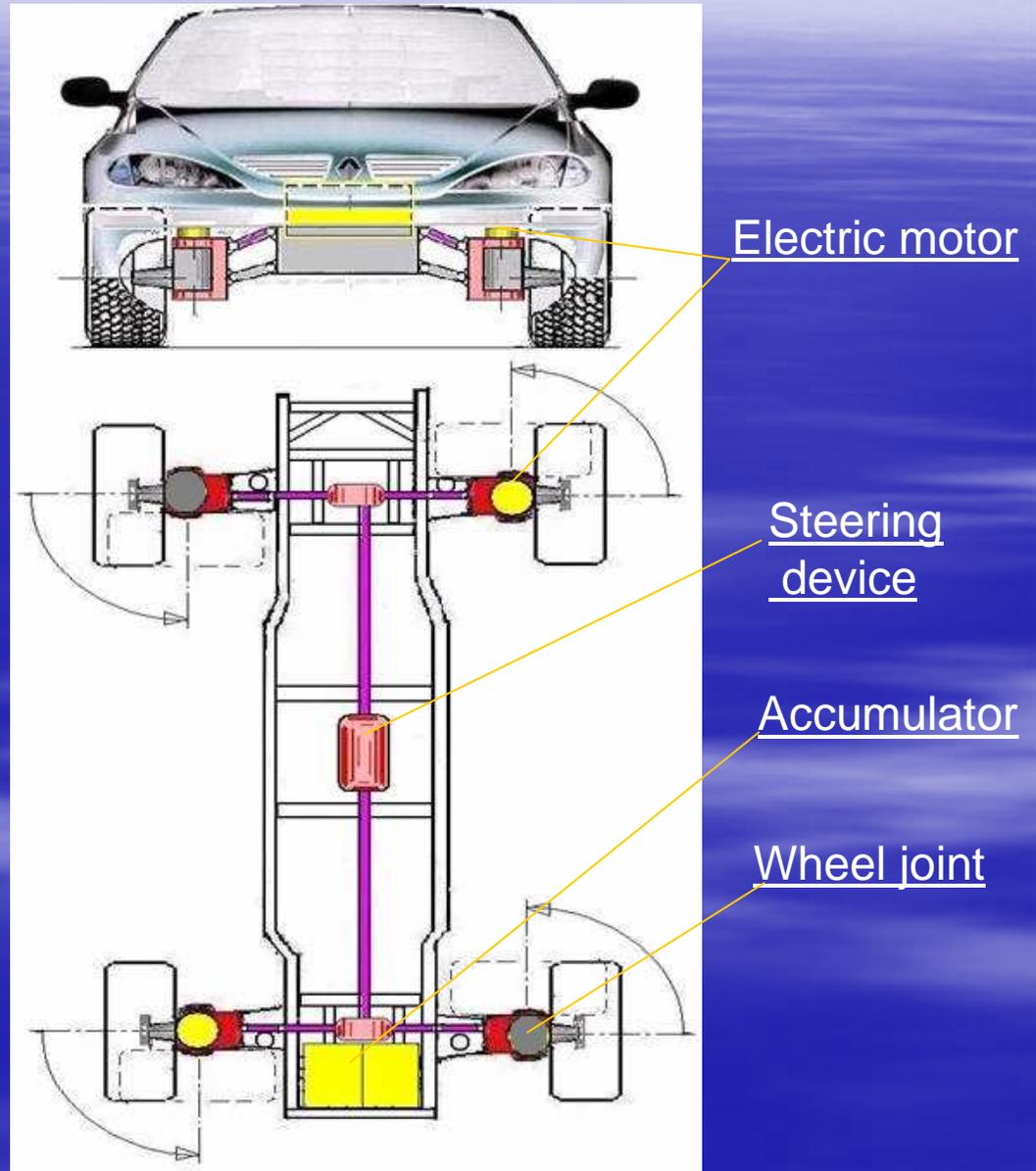
Curvilinear maneuvering in the longitudinal and transversal directions.

1. Highly Maneuverable Vehicles & Effective Urban Transport

HIGLY MANEUVERABLE ELECTRIC CAR

Characteristics

Capacity, places	5
The maximal angle of turn of wheels	$\pm 90^\circ$
The minimal radius of a turn, m	2,0
Abilities of maneuvering	<ul style="list-style-type: none">- Flat-parallel maneuvering;- Lateral movement;- Rotation at a point



1. Highly Maneuverable Vehicles & Effective Urban Transport



Economic Potential

The proposed steering system provides to HMV following the customer's need:

- Quick parking and maneuvering in even the most cramped conditions;
- A high road-stability, energy savings and reduced of the wear wheels;
- Movement in the transverse direction, making it easier parking and detour of other vehicles on overloaded highways;
- Maneuvering with small turning radius, including the rotation at the point, it facilitates the movement of vehicles in places constrained to maneuver;
- Turn of the wheels through of rolling around their axes that significantly reduces wear on the wheels, and allows turn of the wheels with minimal effort, both during motion and on parking.

The variety and mass customers, needing in such qualities, will provide to HMV large potential market size.

1. Highly Maneuverable Vehicles & Effective Urban Transport



Innovation impact

The wide application of the proposed innovation will provide the following benefits:

- Reduction investments and improving reliability of HMV due to the presence of kinematic links between all the wheels and steering device;
- Saving the customer time and energy HMV by reducing the number of necessary maneuvers.
- Saving of area required for parking HMV, due to the ability of the movement "crab";
- Improve safety and facilitate traffic due to the ability of flat-parallel maneuvering;
- Reduction customer's costs by reducing wheel wear and energy savings while maneuvering.

The life cycle of the entire proposed steering system is also will be increased by reducing the number of required maneuverable operations.

1. Highly Maneuverable Vehicles & Effective Urban Transport



The need of additional partners

ADDITIONAL CONSORTIUM PARTNERS

- **Company-manufacturer: Cars and Components for cars**
- **Company-Researcher: Electric drives and control systems, the Electric and thermal equipment**
- **Company of Robotics: Remote control and software**
- **Joint Research Centre (JRC): Market, certification, testing and evaluation analysis**

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Project Proposal Title 2	New Devices for Energy Utilization of Traffic, and next generation of Road Infrastructure
Call Identifier 2	ACTIVITY 7.2.5. STRENGTHENING COMPETITIVENESS
Topic 2	SST.2013.5-3. Innovative, cost-effective construction and maintenance for safer, greener and climate resilient roads

2. New Devices for Energy Utilization of Traffic



Road Device for Vehicles (RDEG1)

Variant 1

(one traffic lanes):
Amount of the electric
power - 352KWh / day

Variant 2

(two traffic lanes)
Amount of the electric
power - 704KWh / day

Input data: Power of generator– 30KW

Intensity of traffic-- 1000 vehicles / hour

2. New Devices for Energy Utilization of Traffic



Typical clients of offered systems RDEG1

- Urban transitions, inputs in ring traffic (square), on slopes and curvilinear plots of roads;
- Parkings on inputs in shopping centers – heightening profits;
- Paid roads: inputs and exits;
- Any plants, before which the band of deceleration ("recumbent policemen ") is necessary;
- The road companies: before traffic lights and intersections of highways.

2. New Devices for Energy Utilization of Traffic



Road Device for Trains (RDEG2)

Variant 1

(one traffic lanes):

Amount of the electric power - 2384KWh / day

Variant 2

(two traffic lanes)

Amount of the electric power - 4768KWh / day

Input data: Power of generator– 200KW

Intensity of traffic-- 230 coaches / hour

2. New Devices for Energy Utilization of Traffic



Typical clients of offered systems RDEG2

In places of execution of deceleration:

- Before stations and stoppings;
- Before intersections and traffic lights;
- On slopes and curvilinear plots.

The potential markets:

- Passenger and cargo railway transport;
- The electrical railway;
- Light urban trains and trams;
- Undergrounds;
- Urban pendant roads and single-rail transport;
- Rail industrial conveyance and hoisting facility.

2. New Devices for Energy Utilization of Traffic



Generating of the electric power by the one device RDEG

Parameters	$V_1 = 50\text{km/h}$	
	RDEG1	RDEG2
Hourly electricity generating, kWh	22,0	149,0
Daily electricity generating, kWh	352,0	2384,0
Slowing down - $\Delta V = V_1 - V_2$, km/h	7,0	3,5
Speed of the vehicle after RDEG - V_2 , km/h	43,0	46,5

* V_1 - speed of the vehicle before RDEG;

RDEG1 – for vehicles;

RDEG2 – for coaches of train.

Input data:

Intensity of traffic: vehicles/hour – 1000
coaches/hour - 230

Mass, ton: vehicle – 2
coach - 35

2. New Devices for Energy Utilization of Traffic



Business logic of the RDEG1 / RDEG2

- **The cost price of 1kwh:** less than 1cent;
- **The price of the device:**
\$25 000 / \$40 000 in account on one generator;
- **The price of the generated electricity:**
\$16 000 / \$84 000;
- **By-products:**
count of trains, message on traffic intensity.

2. New Devices for Energy Utilization of Traffic



Advantage before the competitors

- Mentioned analogs has basic deficiencies related to low efficiency, very large occupied area and complexity.
- Therefore its engineering and economic indexes many times over yield to similar indexes of the offered RDEG1/2 device, that is visually visible from below placed table.

2. New Devices for Energy Utilization of Traffic



Technical and Economical parameters of RDEG compare to analogs

Parameter	RDEG1/2 (IL, 2010)	Whirligig (IL, 2004)	EKRR (GB, 2006)
<u>1. Initial data</u>			
Intensity of traffic (c+t), vehicle/hour	1000/230	1000	1000
Electricity cost, \$/kWh	0,12 *	0,12	0,12
<u>2. Technical parameters</u>			
Area occupied by generators, sq. m	1,5/1,5	1,5	3,0
Power and amount of generators, kWxN	30x1/200x1	2,0x2	8,0x1
Generated Energy, KWh/hour	22,0/149,0	3,0	6,0
<u>3. Economical parameters</u>			
Device cost, \$thou.	25/40	24	37
Generated energy per year, kWh	105 600/ 715 200	14 400	28 800
Generated electricity cost, \$thou/year	16,0/84,0	1,7	3,5
Return of Investments, years	1,6/0,5	13,9	10,7

2. New Devices for Energy Utilization of Traffic



The need of additional partners

ADDITIONAL CONSORTIUM PARTNERS:

- **Company-manufacturer:** components of transport infrastructure.
- **Electrotechnical Company:** Converters, accumulators and electric equipment.
- **Company-Researcher:** Control systems, information systems for road and electrical supply.
- **Joint Research Centre (JRC):** Market, certification, testing and evaluation analysis.

We thank you for attention

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