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# IMPLEMENTING HYBRID CARS IN AL AIN HOSPITAL

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## PURPOSE AND MAIN GOAL

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The purpose of this report is to assess the effectiveness of implementing hybrid cars in Al Ain Hospital transportation service.

The main goal of this project is to reduce the hospital's fuel consumption and play a main role in reducing the gas footprint in UAE to be a part of the Government's efforts to provide a cleaner environment.

Hybrid cars will be tested in different situations to test their performance in all conditions.

The hybrid cars used in this study are:

- 1- 2018 Toyota Prius
- 2- 2018 Hyundai ioniq

The two cars will be in comparison with our current car which is 2015 Nissan Altima.

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## FUEL CONSUMPTION TEST

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To assess the fuel consumption of the hybrid cars and get accurate results in different circumstances, a 3 different routes has been designed to test the hybrid cars in city, highway and both city and highway at the same time.

- ❖ The selected measured attributes are based on global standards in testing fuel consumption.
- ❖ there are unlimited variations in driving styles, as well as roads, and weather conditions, all of them can have a minor impact on the results achieved.
- ❖ The test tracks was run 3 times for each car with 3 different drivers in order to get an indication of the variation in consumption and to get the most realistic results.
- ❖ other factors that can affect the results such as tire pressure, number of passengers, fuel type and Idling time which is running the car engine when the car is not in motion.
- ❖ All test tracks are saved on google map to be used by anyone to compare the results with different cars.



## ROUTES & TEST RESULTS

### ➤ CITY TEST:

This test simulates a moderate driving in traffic-intense condition around the city – this route reflect a usual daily trip for Al Ain Hospital.

Route stop points:

Al Ain Hospital → Tawam Hospital → Al Maqam Police Station → Falaj Hazza → Rotana Hotel → Ayla Grand Hotel → Oud Al Touba Clinic → Hili Police Station → Hili Rayhaan Hotel → Al Ain Hospital.



Route 1 – City

route link (google map):

<https://goo.gl/maps/Aw7wf3g2QXs>

### ➤ CITY TEST RESULTS:



Nissan Altima  
9.1 KM/L



Hyundai Ioniq  
27.7 KM/L



Toyota Prius  
26.3 KM/L

### Test Attributes

Distance	64 KM
Average Speed	39 km/h
Top Speed	90 km/h
Avg. number of Stops (roundabouts & traffic lights )	24
Time	1 hour, 43 min.
Avg. Idling time	12 minutes
Outside temperature	26 °C
Air Condition (on/off)	On ( level 2 )
Tire Pressure	33 psi
Number of passenger	2

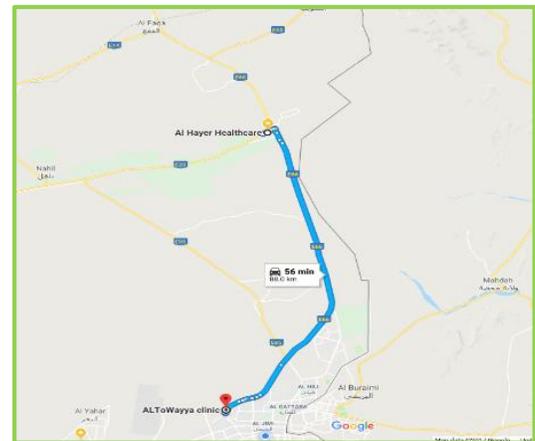
➤ HIGHWAY TEST:

This test simulates a Highway driving with an average speed of 135 KM/H.

Route stop points:

Al Towayya Children's Specialty Center → Al Hayer Healthcare Center

→ Al Towayya Children's Specialty Center.



Route 2 – Highway

route link (google map):

<https://aoo.al/maps/56u2nzDxZm22>

➤ HIGHWAY TEST RESULTS:



Nissan Altima

12.8 KM/L



Hyundai Ioniq

20.4 KM/L



Toyota Prius

19.2 KM/L

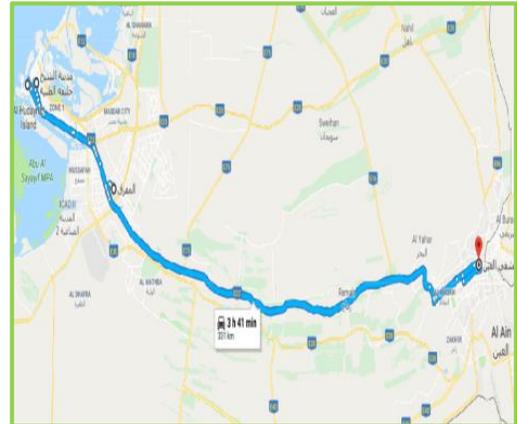
Test Attributes	
Distance	89 KM
Average Speed	112 km/h
Top Speed	135 km/h
Avg. number of Stops (roundabouts & traffic lights )	2
Time	54 min
Avg. Idling time	0
Outside temperature	28 °C
Air Condition (on/off)	On ( level 3 )
Tire Pressure	33 psi
Number of passenger	1



➤ CITY & HIGHWAY TEST:

This test is a regular trip from Al Ain to Abu Dhabi, 70% highway driving and 30% city driving. This test reflects the daily trip to deliver the blood samples from Al Ain Hospital to SKMC and also to deliver documents to SEHA and other hospitals in Abu Dhabi.

Route stop points: Al Ain Hospital → SKMC → SEHA → Al Ain Hospital



Route 3 – Highway & City route link (google map):

<https://goo.gl/maps/VxvFEHHRday>

➤ CITY & HIGHWAY TEST RESULTS:



**Nissan Altima**  
**10.6 KM/L**



**Hyundai Ioniq**  
**21.28 KM/L**



**Toyota Prius**  
**20.0 KM/L**

Test Attributes	
Distance	354 KM
Average Speed	74 km/h
Top Speed	150 km/h
Avg. number of Stops (roundabouts & traffic lights )	N/A
Time	4 hours, 55 min
Avg. Idling time	N/A
Outside temperature	23 - 28 °C
Air Condition (on/off)	On ( level 1 - 2 )
Tire Pressure	33 psi
Number of passenger	1



## FUEL COST COMPARISON:

The below tables shows a comparison between the 3 tested cars in terms of fuel cost:

- Fuel cost to drive 350,000 KM in all conditions (Highway & City Combined):

	 <b>Nissan Altima</b>	 <b>Hyundai Ioniq (Hybrid)</b>	 <b>Toyota Prius (Hybrid)</b>
Average km/L	10.80 km/L	23.13 km/L	21.83 km/L
Cost to drive 350,000 km in all conditions	63,194.44	29,507.13	31,264.31

- Fuel cost to drive 100,000 KM in city only:

	 <b>Nissan Altima</b>	 <b>Hyundai Ioniq (Hybrid)</b>	 <b>Toyota Prius (Hybrid)</b>
Average km/L	9.10 km/L	27.70 km/L	26.3 km/L
Cost to drive 100,000 km in city only	21,428.57	7,039.71	7,414.45

- Fuel cost to drive 300,000 KM in highway only:

	 <b>Nissan Altima</b>	 <b>Hyundai Ioniq (Hybrid)</b>	 <b>Toyota Prius (Hybrid)</b>
Average km/L	12.8 km/L	20.4 km/L	19.2 km/L
Cost to drive 300,000 km in highway only	45,703.13	28,676.47	30,468.75

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## ADVANTAGES & DISADVANTAGES

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The below table shows the Advantages & Disadvantages of using hybrid cars in Al Ain Hospital:

Advantages	Disadvantages
1. Saving fuel	1. Passenger Seating space
2. using battery power in Idling time	
3. Extra Cargo Space	
4. Environmentally friendly	
5. Rent cost is approx. equal to regular cars.	

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## RECOMMENDATIONS

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1. Hybrid cars are highly recommended because they are better than regular cars in all conditions in terms of fuel consumption.
2. Hybrid Cars should be used to deliver blood samples to Abu Dhabi:
  - Extra cargo space
  - Saving more than 63,000 AED in 3 years
3. Hybrid cars should be used for Al Ain region with and without passenger
  - Hybrid cars can save 3 times more than regular cars in city.