

Financial Disincentives Traffic Decongestion

December 2023



Tharaa
Financial
Center



Motivations



Population Growth

Saudi Arabia is experiencing an unprecedented growth in its population. The Crown Prince, His Royal Highness Mohammed Bin Salman, outlined in his Vision 2030 plan his goal of the country's population reaching around 50 million by the year 2030.

Also under Vision 2030, Saudi Arabia's capital of Riyadh is expected to grow towards about 20 million inhabitants.

Unfortunately, one of the unintended consequences of such rapid population growth is the issue of rising traffic and congestion within the country, particularly in the city of Riyadh.

Additionally, the population could experience even greater growth in the coming years due to significant upcoming events like the Expo in 2030 (with an average of 20 million visitors) and the World Cup in 2034 (with an average of 7 million visitors).



Total Cars and Traffic Congestion

Currently, Riyadh is experiencing a substantial surge in traffic along its streets.

As of 2023, Riyadh presently has around 2.3 million cars with that number expected to more than double to 4.78 million cars by 2030 as the population continues to grow.

The distribution of car ownership in Riyadh is rather even between Saudis and Non-Saudis with Saudi nationals accounting for roughly 60% of the cars being operated in Riyadh and the remaining 40% being attributed to expatriates.



Total Accidents and Traffic Deaths

Naturally, as the number of cars and resulting traffic continue to both rise, the amount of accidents can be expected to follow suit.

The number of car accidents in Riyadh alone is expected to more than double from about an estimated 99,000 for the current year to over 205,000 total accidents by the year 2030.

It is estimated that in the year 2023, Riyadh endured over 670 fatal accidents resulting in deaths. At that same rate, as traffic continues to increase, that number is also expected to more than double with Riyadh expecting to experience nearly 1,400 fatal car accidents.

This further highlights the need for prompt measures and solutions to help tackle this issue.



Pollution and Air Quality

At the moment, Saudi Arabia is one of the top 15 worst countries ranked for both pollution level and air quality.

This problem will only be further exacerbated as traffic congestion and the number of cars continues to rise within the country.

PM2.5 (particles with a diameter of 2.5 micrometres or less): these particles are so small they can get deep into the lungs and into the bloodstream causing adverse health effects. Based on the data, there is an evident and consistent rise in PM2.5 levels between 2019 and 2022 with a likely continuation in its increase.



Proposed Solutions

To help combat the substantial rise in traffic and congestions, we propose some solutions revolving around financial disincentives.

Certificates of Entitlement have previously been used by other countries, such as Singapore, to give the purchaser the privilege of car ownership and operation within the country for a given price.

We suggest that Saudi Arabia similarly imposes Certificates of Entitlement with a 10,000 SR minimum annual cost for to allow expatriates to own and operate a passenger vehicles within the Kingdom of Saudi Arabia. Further, initial registration must have the cars not exceed 5 years old and no more than 10 years old during any points for Certificates of Entitlement renewals.



Results

As a result of imposing financial disincentives, such as Certificates of Entitlement for car ownership and operation, we conservatively estimate a significant reduction in traffic and congestion in Riyadh.

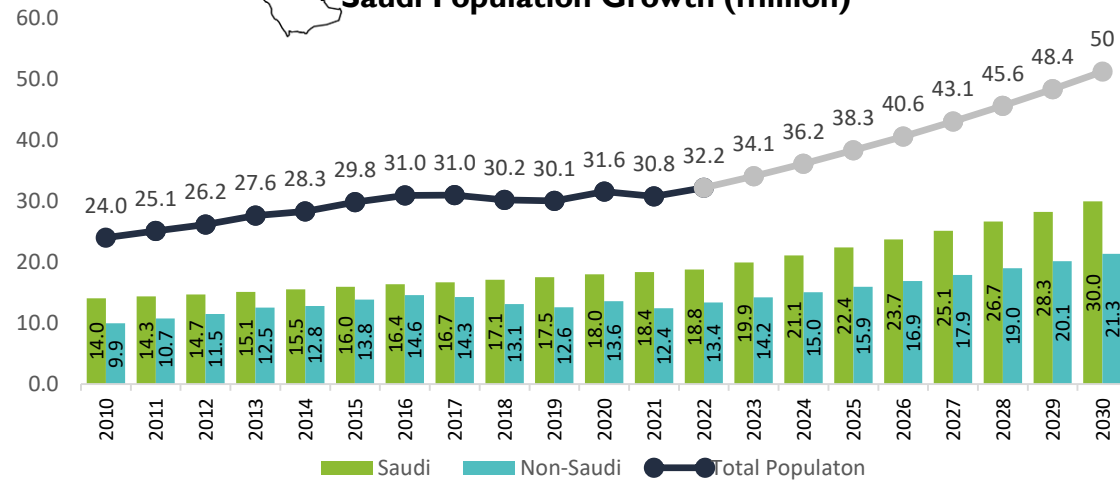
Assuming only a 50% deterrence rate for those earning less than 5,000 SAR a month and 30% for those higher than 5,000 SAR, we estimate that the number of expected total passenger vehicles on the road will be decreased by about 20% every year resulting in reduction from a projected 4.78 million cars to 3.79 million cars for the year 2030.

Our estimates indicate that income generated from public transportation will be nearly 26 billion SAR by the year 2030, while income generated from Certificates of Entitlement will be over half a billion SAR for a total of over 26.49 Billions SAR.

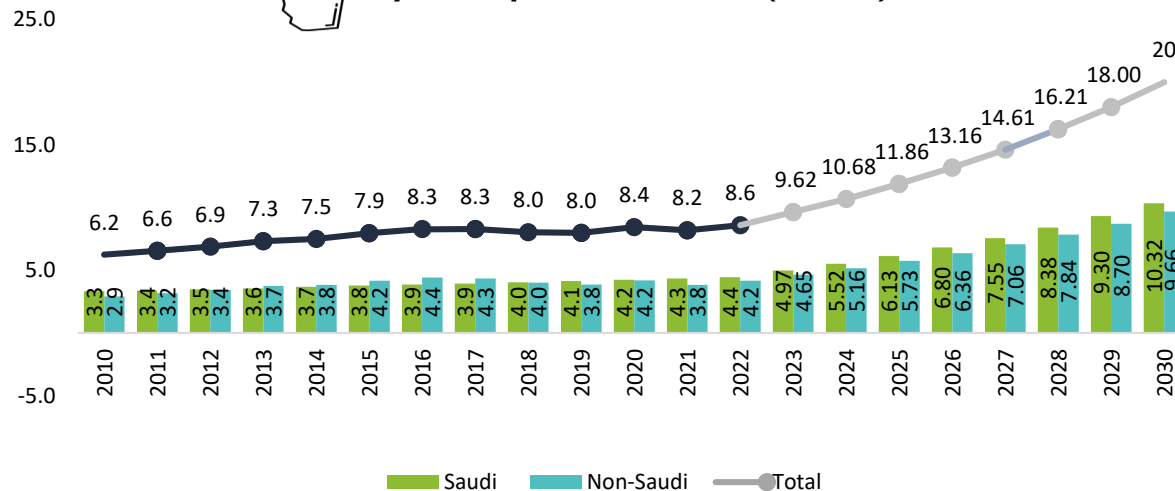
Population Growth



Saudi Population Growth (million)



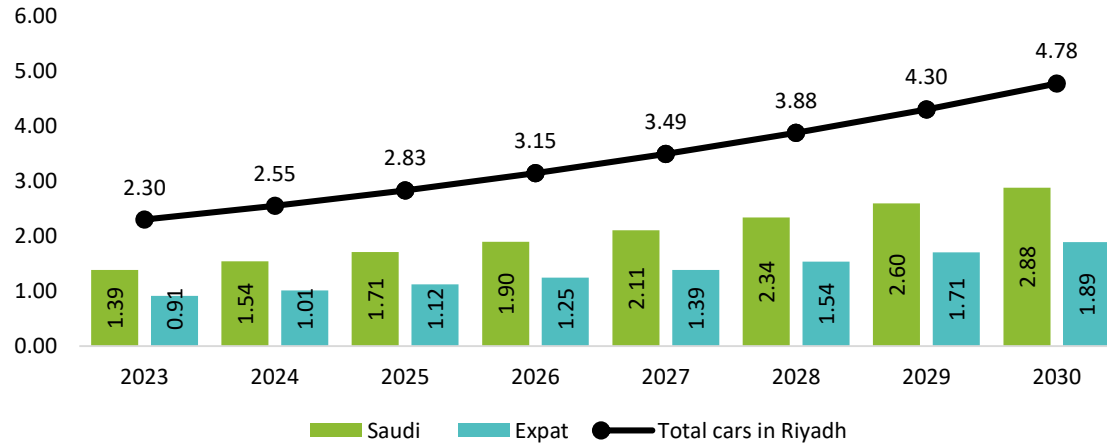
Riyadh Population Growth (million)



- Saudi Arabia is experiencing an unprecedented growth in its population. The Crown Prince, His Majesty Mohammed Bin Salman, outlined in his Vision 2030 plan his goal of the country's population reaching around 50 million by the year 2030.
- Also under Vision 2030, Saudi Arabia's capital of Riyadh is expected to grow towards about 20 million inhabitants.
- The adjacent graphs show the trajectory of population growth for both Saudi Arabia as well as Riyadh, as we approach the specified goals and projections.
- Unfortunately, one of the unintended consequences of such rapid population growth is the issue of rising traffic and congestion within the country, particularly in the city of Riyadh.

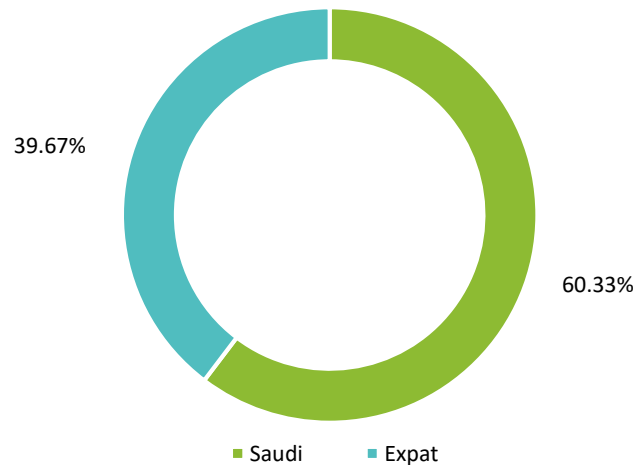
Total Cars and Traffic Congestion

Expected Total Cars in Riyadh (mln)



- Currently, Riyadh is experiencing a substantial surge in traffic along its streets.
- As of 2023, Riyadh presently has around 2.3 million cars with that number expected to more than double to 4.78 million cars by 2030 as the population continues to grow.

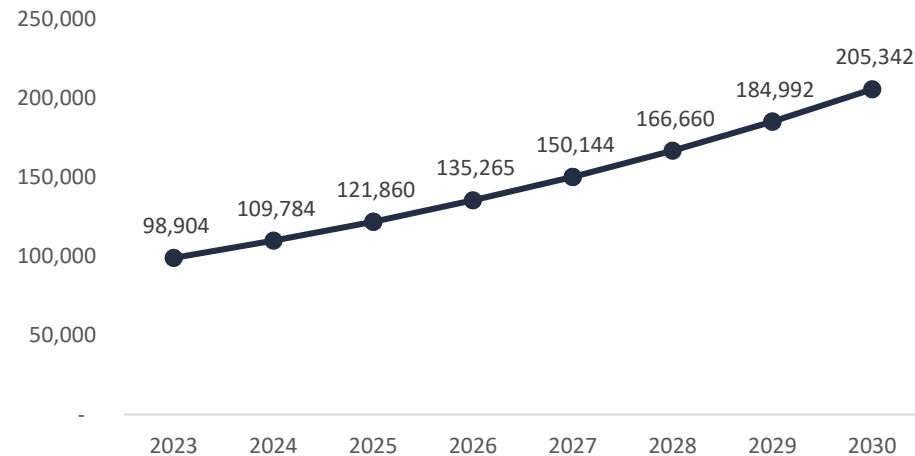
Percentage Distribution of Car Ownership in Riyadh



- The distribution of car ownership in Riyadh is rather even between Saudis and Non-Saudis.
- Saudi Nationals account for roughly 60% of the cars being operated in Riyadh with the remaining 40% being attributed to expatriates.

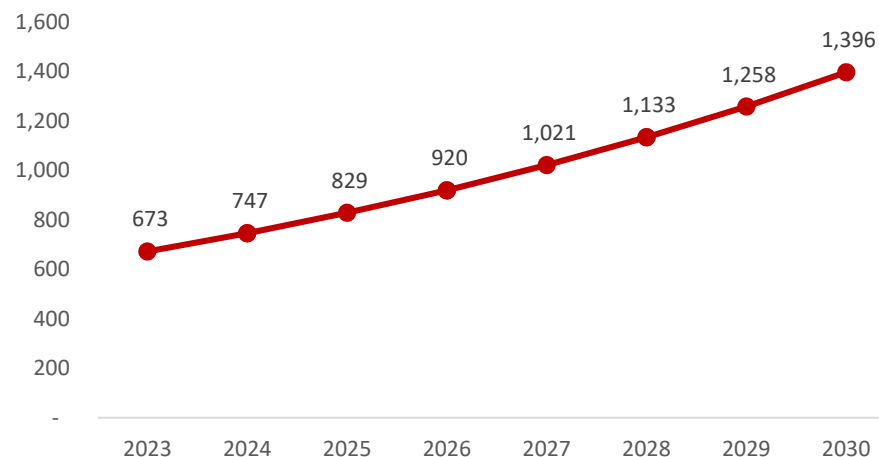
Total Car Accidents & Fatalities

Expected Car Accidents in Riyadh



- Current year projections for total car accidents estimates a total of about 99,00 car accidents in the city of Riyadh, Saudi Arabia's capital.
- Naturally, as the number of cars and resulting traffic continue to both rise, the amount of accidents can be expected to follow suit.
- The number of car accidents is expected to more than double, topping 205,000 total accidents by the year 2030.

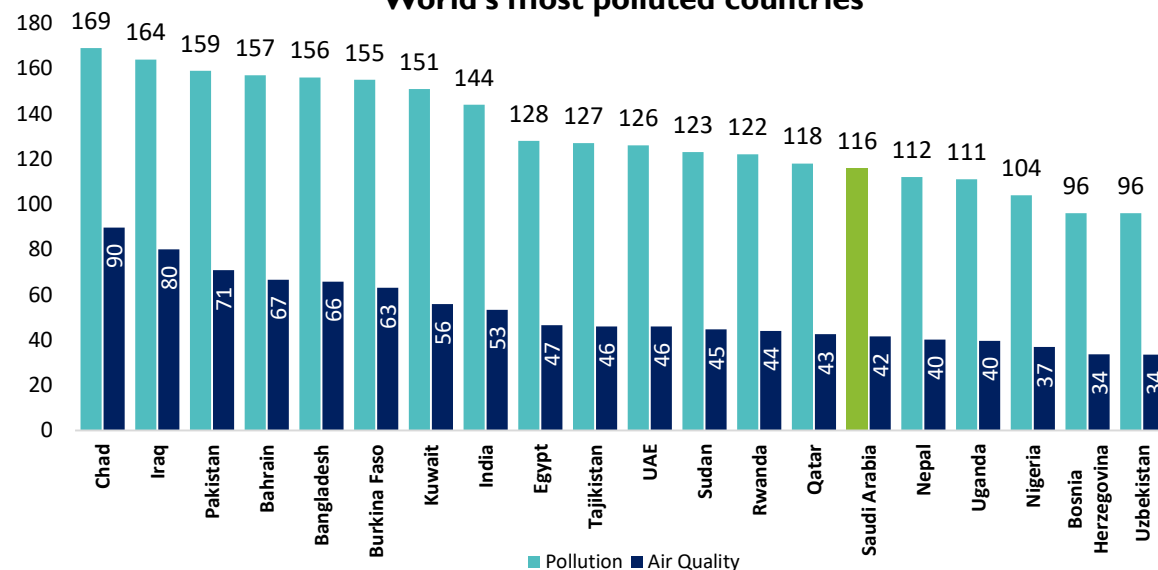
Number of Car Accident Deaths in Riyadh



- It is estimated that in the year 2023, Riyadh endured over 670 fatal accidents resulting in deaths.
- At that same rate, as traffic continues to increase, that number is also expected to more than double with Riyadh expecting to experience nearly 1,400 fatal car accidents.
- This further highlights the need for prompt measures and solutions to help tackle this issue.

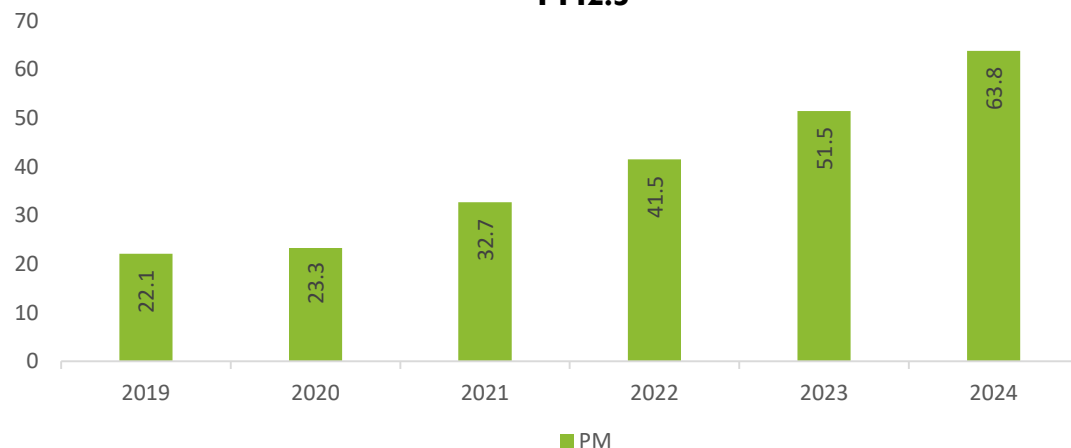
Pollution and Air Quality

World's most polluted countries



- From 2022, Saudi Arabia is one of the top 15 worst countries ranked for both pollution level and air quality.
- This problem will only be further exacerbated as traffic congestion and the number of cars continues to rise within the country.

PM2.5



- PM2.5 (particles with a diameter of 2.5 micrometres or less): these particles are so small they can get deep into the lungs and into the bloodstream. There is sufficient evidence that exposure to PM2.5 over long periods (years) can cause adverse health effects.
- Based on the data, there is an evident and consistent rise in PM2.5 levels between 2019 and 2022. Further, it is also likely that this upward trend will continue in the future.

Proposed Solutions



Financial Disincentives

To help combat the substantial rise in traffic and congestions, we propose some solutions revolving around financial disincentives.

Imposing such solutions will likely reduce the number of cars on the road, traffic congestion, car accidents, fatal accidents, and pollution while also increasing the use of available public transportation.



Certificates of Entitlement

Certificates of Entitlement have previously been used by other countries, such as Singapore, to give the purchaser the privilege of car ownership and operation within the country for a given price.

Furthermore, Singapore currently charges between around \$85,000 (320,000 SR) to over \$135,000 (507,000 SR) for 10 years of car use. This cost is equivalent to about \$7,000 (27,000 SR) to \$11,250 (42,000 SR) per year vehicle operation.

We suggest that Saudi Arabia similarly imposes Certificates of Entitlement with a 10,000 SR minimum annual cost for to allow expatriates to own and operate a passenger vehicles within the Kingdom of Saudi Arabia



Additional Potential Solutions

Aside from the previously mentioned Certificates of Entitlement, we also suggest some additional solutions to help combat the continuously rising traffic and congestions.

First, with online shopping and home deliveries experiencing rapid growth within the Kingdom of Saudi Arabia, restricting logistic companies from using passenger vehicles and requiring them to carry out operations using appropriate delivery buses will also drastically reduce traffic within the country.

Additionally, we recommend increasing the fines for heavy duty commercial trucks operating outside the restricted hours from 5000 SAR to 6000 SAR.

We also propose imposing minimum emission standards during car registration renewals.

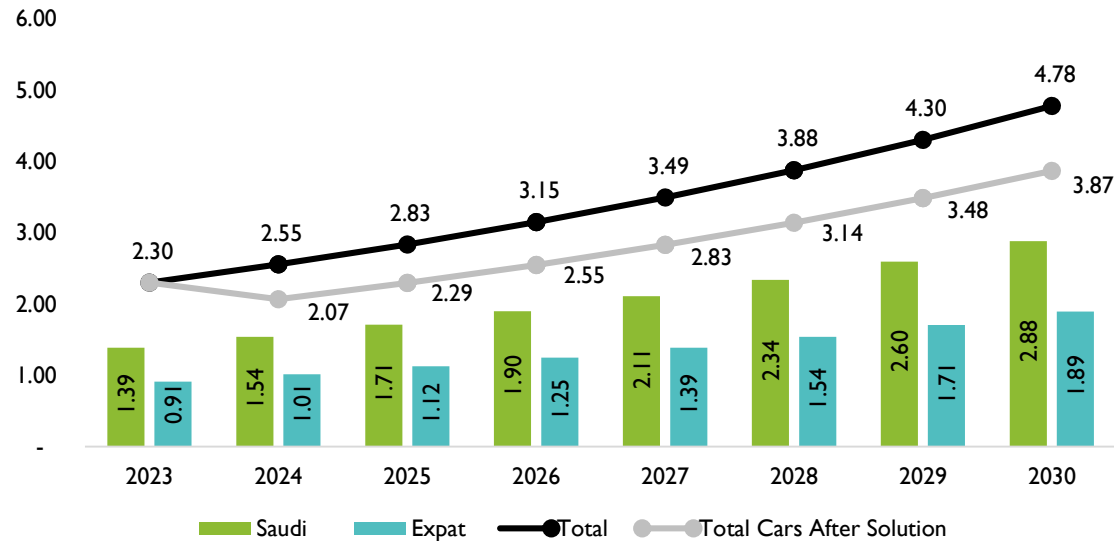


Deterrence Rate

We Assumed only 50% will shift to public transportation for those earning less than 5,000 SAR a month and 30% for those higher than 5,000 SAR, we estimate that it will help us reduce the amount of cars by 900K in the year 2030.

Traffic Reduction After Solutions

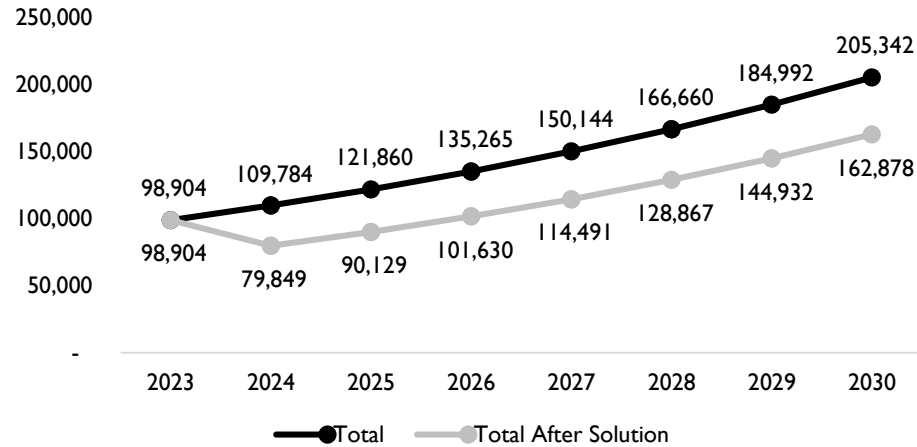
**Expected Total Cars in Riyadh After Solutions
(Millions)**



- As a result of imposing financial disincentives, such as Certificates of Entitlement for car ownership and operation, we conservatively estimate a significant reduction in traffic and congestion in Riyadh.
- Assuming only a 50% deterrence rate for those earning less than 5,000 SAR a month and 30% for those higher than 5,000 SAR, we estimate that the number of expected total passenger vehicles on the road will be decreased by over 20% every year.
- More specifically, this results in a reduction from a projected 4.78 million cars to 3.79 million cars for the year 2030.

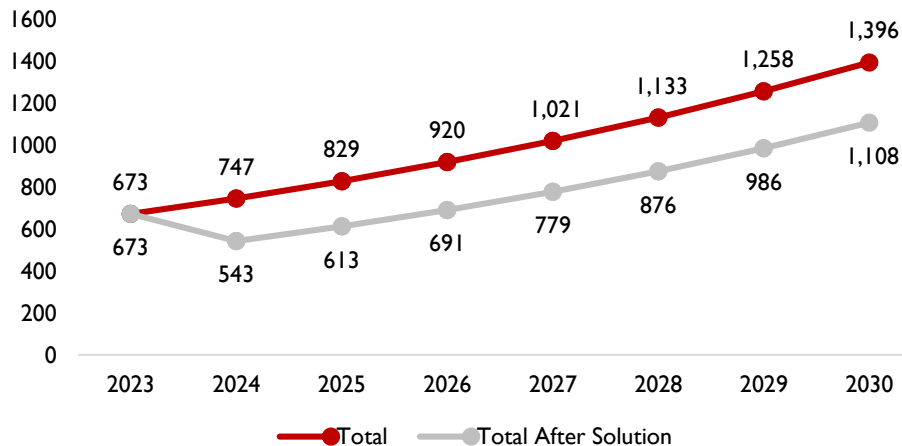
Reduction in Accidents & Fatalities After Solutions

**Expected Car Accidents in Riyadh
After Solutions**



- As a result of the financial disincentives along with the resulting reductions in cars and traffic, we expect the number of car accidents in Riyadh to be reduced drastically over the coming years, as evidenced by the accompanying graph depicting the expected total number of accident with and without the enactment of the proposed solutions.
- This results in a reduction of over 20% of traffic accidents in Riyadh, with the year 2030 seeing projected car accidents lowered from over 205,000 to about 163,000 after the enforcement of the proposed solutions.

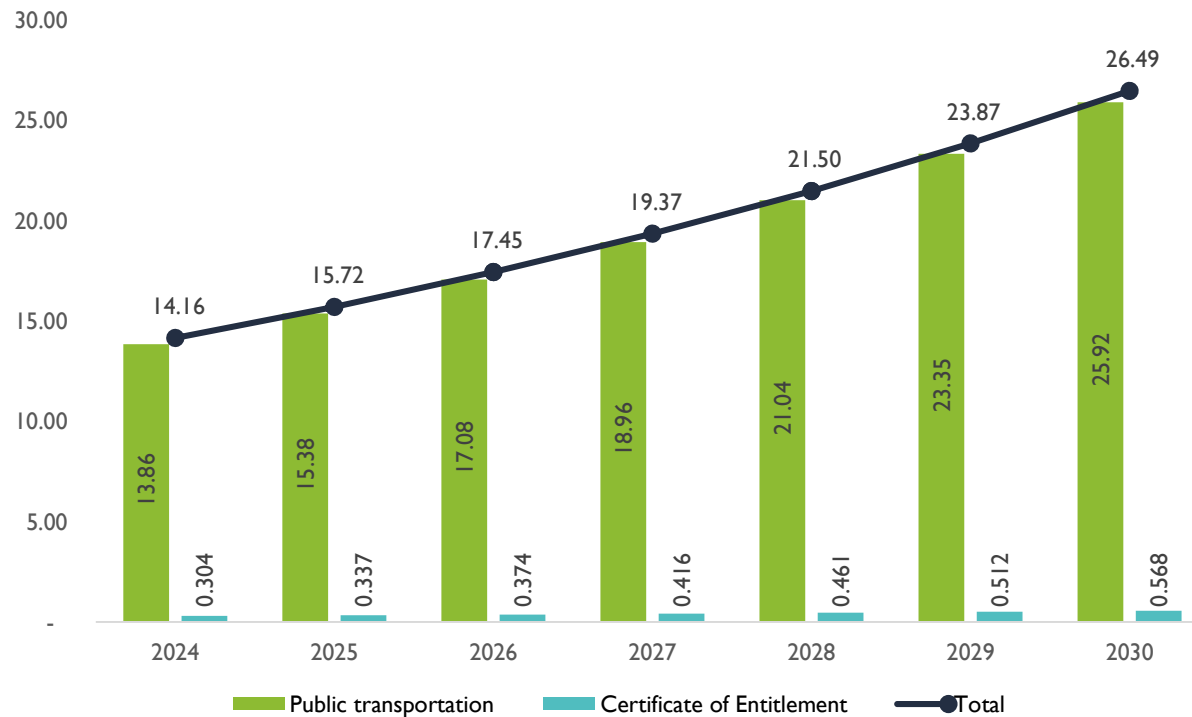
**Expected Car Accident Deaths in Riyadh
After Solutions**



- We also expect the total number of fatal accidents resulting in unfortunate deaths to be significantly reduced as a direct consequence of such proposed solutions involving financial disincentives.
- Specifically, the total number of deaths from car accidents in Riyadh is expected to drop from about 1,400 annually to just over 1,100 in the year 2030 as depicted by the associated graph to the left.
- This again signifies an over 20% decrease in fatalities or deaths resulting from car accidents in the city of Riyadh.

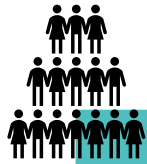
Financial Benefits and Government Revenue

Expected Revenue from Public Transportation & Certificates of Entitlement (Bln)



- Aside from the significant reduction in traffic and congestion, our proposed solution also further encourages the use the vastly available world class public transportation infrastructure already in place in Saudi Arabia.
- Assuming only a 50% deterrence rate, our estimates indicate that income generated from public transportation will be nearly 26 billion SAR by the year 2030.
- Furthermore, income generated from Certificates of Entitlement will be over half a billion SAR for the year 2030.
- The total income generates for the Saudi government from the imposition of such financial disincentives will total nearly 26.49 billion SAR for year 2030, with that number expected to continue to increase in the subsequent years.

Methodologies



Population Growth

- We implemented a 6% Growth rate in Saudi in order to reach 50 million on 2030 as targeted.
- Growth rate in Riyadh is projected at 11% in order to reach 20 million by 2030 as targeted.
- Our growth forecast does not account for upcoming major events like Expo and the World Cup, which have the potential to substantially increase the population.



Expected Total Cars

- In our estimation we expected that the Saudi household has an average of 1.8 cars per household, while the Expatriate household with one member has an average of 0.5 cars and an average of 1 car for 2 or more members. The weighted total average of both equates to 1.38, in line with figures from the General Authority for Statistics
- Conservatively, we estimate 50% of expatriates earning below 5,000 SAR per month are expected to switch to public transportation, while 30% of those earning above 5,000 SAR per month will also make the shift. These figures do not include the remaining portions of the population that might also make the shift to either public transportation or Certificates of Entitlement, maintaining a conservative estimate



Expected Government Revenue

- Our method based on the conservative assumption that only 50% of people who earn below 5,000 SAR monthly will shift towards the use of public transportation and 30% of people who earn more than 5,000 SAR monthly will also shift to the use of public metro & buses.
- Our method is also based on the conservative assumption that only 30% of people who earns more than 5,000 thousands monthly will purchase the Certificate of Entitlement at 10,000 SAR annually.
- This estimate does not include any financial contributions from family members in order to maintain a conservative assessment.



Total Car Accidents & Fatalities in Riyadh

- According to the available data , there are 15.7mln cars in Saudi Arabia, and based on our estimation, Riyadh accounts for 2.3mln of those cars. our estimation suggests that Riyadh represents around 14% of the total number of cars in Saudi Arabia.
- Given that the car population in Riyadh represents 14% of the total cars in Saudi Arabia, the number of deaths in Riyadh also accounts for 14% of the overall deaths in the country. According to information obtained from Al-Watan, the reported number of deaths in Saudi Arabia is 4,652, while specifically in Riyadh, the reported number of deaths is 651.

Disclaimer

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