Assumptions:

1. Revenue impact is equivalent among the 3 modes. A 1% increase in spending on vehicle has the same ROI as a 1% increase on air or rail.
2. All three transportation modes have equal need of attention. It wouldn’t make any sense to suggest improving the road system if it is currently only at 50% usage (unless we spent the money on marketing to get people to use what we already built, but this money is earmarked for infrastructure improvement). Whereas if air is at 100% capacity, an increase in usage would not be possible without infrastructure improvement.
3. Between 1&2 I can now scale the data so each is on same magnitude
4. I am going to assume that no outside entity is trying to influence the use of a specific mode of travel. For example, the national/state govt of Gotham is not trying to influence people to use more rail and less car travel. This would affect the trends and seasonality we are currently observing.
5. That these do not have some sort of dependence on each other
6. The population trend of Gotham will continue along same trend

After considerable time exploring the data we have available, we have come up with forecasts for each of the transportation methods. Based on our estimates, it is best for you to be spending your money on vehicle travel. The following is an explanation of how we determined this.

The event of Sep 2001 had a significant impact on air travel, but the data shows that the event did not have an equivalent significant impact on vehicle or rail travel. With that in mind, we decided to first analyze the impact this event had on air travel. First, to see if Gotham’s air traffic has recovered from this event or not, we created a model using the data prior to Sep 2001. The result of this model was a clear upward trend of usage. As well, each year the seasonal high in August, gradually increased at a faster rate than the previous August. When we modeled all the data, including post Sep 2011, we do not see the same level of growth year over year. This is suggesting that Gotham has not recovered back to pre-Sep 2001 trends in growth. This also suggests that any future similar events could have a significant impact on air travel.

Next, we decided to create a forecast out 48 months for each travel method. The charts at the end of this document show the results of the forecast.

In examining the chart for rail, you notice a light grey band, a dark grey band, and a blue line. The light grey band represents that we are 95% confident the real value for the future will fall within that band. The dark grey represents that we are 80% confident. The blue line represents an average of where the predicted value might fall. As we get farther away from the beginning point, you can see that the colored bands become wider and wider. This represents that we are becoming less and less confident in our ability to accurately predict. But even with that the general trend is sloping downward, suggesting that we will see a decrease in rail ridership.

In examining the chart for air, you can see that the confidence bands are not growing in size. This means that we have roughly the same confidence level for our predicting ability even as we get farther away from the starting point. The bands are still quite large, though.

In examining the chart for car, the first most important point to notice is that there is virtually no impact on car travel from the Sep 2001 event. Suggesting that car travel is potentially more resilient to these types of events. There are 2 other ideas to point out. The confidence bands are much tighter and they do not grow very significantly the further away from the starting point.

Because rail is showing a decline, we decided that rail is not where the future lies in Gotham. The future lies with either road or air travel.

Both Air and Car show us an upward trend in their future usage. Our forecasting model suggests it is more confident with the predictions of Car usage than that of Air. But with a more consistent upward trend and a tighter band of confidence in our forecasts, we believe that car travel is the best place to spend the money to encourage even more growth for a potential higher ROI.



