**Develop proposals for how to alleviate traffic growth issues**

Utilize fluid dynamic principals to control the flow of traffic.

**Develop a preliminary calculation plan for economic impact**

District 7 Data

**Gas price summary:**

Min. 1.146

1st Qu. 2.203

Median 3.012

Mean 2.919

3rd Qu. 3.617

Max. 4.707

**Income:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| County | Returns | AGI | Median.Income | Taxable.Assessed | Population |
| Los Angeles | 4,255,233 | $310,621,984,000 | $33,369 | $16,810,162,000 | 10,185,487 |
| Ventura | 368,649 | $28,620,713,000 | $39,799 | $1,420,942,000 | 852,013 |

Economic Impact:

Median Income / TWHPY (Total Work Hours Per Yr)

Median Gas Price \* Total Delay Hours

Potential costs of congestion have wide reaching implications on the economy. Potential costs due to heavy congestion should consider emissions, excess vehicle operating costs, productivity losses, unreliability, and delay to cargo creating increased inventory costs.

The three categories to consider are as follows:

* Expected Delays
* Unexpected Delays
* Variable Delays with variance in expected/unexpected delays

The list of most prominent costs associated with traffic congestion delays:

1. Increased travel time
2. Greater travel time unreliability
3. Excess fuel usage
4. Increased emissions
5. Higher accident rates
6. Increased vehicle maintenance costs
7. Excess vehicle operating costs
8. Loss of productivity
9. Higher inventory costs
10. Higher frequency of cargo delays

Peak traffic hours are from 6-10am and 3-7pm creating an 8 hour peak period.

<https://www.transportation.gov/sites/dot.dev/files/docs/Costs%20of%20Surface%20Transportation%20Congestion.pdf>

**Estimation of Fuel Consumption**

Based on the UMR the following equation predicts the average miles-per-gallon (mpg) for potentially congested portion of peak periods:

*Average MPG = 8.8 + 0.25 \* Average Speed*

The methodological appendix to the UMR indicates that on the right-hand side of this equation, the average speed is measured exclusive of incident delay and for the entire eight hours of the peak period. Fuel economy, on the left of the equation, is measured for potentially congested portion of the peak period, a span of less than eight hours as determined by the Roadway Congestion Index

Average MPG = 24.7

<https://www.reuters.com/article/us-autos-emissions/u-s-vehicle-fuel-economy-rises-to-record-24-7-mpg-epa-idUSKBN1F02BX>

Average MPG during acceleration:

<https://nepis.epa.gov/Exe/ZyNET.exe/9100WZVZ.txt?ZyActionD=ZyDocument&Client=EPA&Index=1976%20Thru%201980&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&UseQField=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5CZYFILES%5CINDEX%20DATA%5C76THRU80%5CTXT%5C00000019%5C9100WZVZ.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=2#>

**SUPPORTING INFORMATION**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| VEHICLE TYPE | FUEL TYPE | ENGINE SIZE (LITER) | GROSS VEHICLE WEIGHT (GVW) (LBS) | IDLING FUEL USE (GAL/HR WITH NO LOAD) |
| Compact Sedan | Gas | 2 | - | 0.16 |
| Large Sedan | Gas | 4.6 | - | 0.39 |
| Compact Sedan | Diesel | 2 | - | 0.17 |
| Medium Heavy Truck | Gas | 5-7 | 19,700-26,000 | 0.84 |
| Delivery Truck | Diesel | - | 19,500 | 0.84 |
| Tow Truck | Diesel | - | 26,000 | 0.59 |
| Medium Heavy Truck | Diesel | 6-10 | 23,000-33,000 | 0.44 |
| Transit Bus | Diesel | - | 30,000 | 0.97 |
| Combination Truck | Diesel | - | 32,000 | 0.49 |
| Bucket Truck | Diesel | - | 37,000 | 0.90 |
| Tractor-Semitrailer | Diesel | - | 80,000 | 0.64 |
| Source: Argonne National Laboratory, [Idling Reduction Savings Calculator](http://www.anl.gov/energy-systems/downloads/vehicle-idle-reduction-savings-worksheet), accessed December 2014. | | | | |

<https://www.energy.gov/eere/vehicles/fact-861-february-23-2015-idle-fuel-consumption-selected-gasoline-and-diesel-vehicles>