## Side Guard Cost Chart

| Back of the Envelope Math |  |  |
| :---: | :---: | :---: |
|  | AngelWing | SafetySkirt |
| Definitions <br> - SUG Side Underride Guard (Side Impact Guard or Lateral Protection Device Plus/LPD+ <br> - $\quad \mathrm{mpg}=$ miles per gallon <br> - AW = AngelWing <br> - $\mathrm{SS}=$ SafetySkirt <br> - Lbs = weight in pounds <br> - 1 year estimated miles = 100,000 miles <br> - Estimated cost of 53 dry van $=\$ 25,000$ <br> - Estimated weight of the trailer $=13,000 \mathrm{lbs}$ <br> - Estimated trailer life is 15 years |  |  |
| It would be unreasonable to believe that the cost/lb of mass production of the SUG would be more than the cost/lb of a trailer. With the understanding of the economies of scale, the weight of the trailer in pounds is the constant this formula will work with. |  |  |
| Formula to calculate cost per pound is as follows: <br> Cost of trailer/weight of trailer <br> = Cost per pound <br> $\$ 25,000 / 13,000 \mathrm{lbs}=\$ 1.92 / \mathrm{lb}$ |  |  |
| Estimated SUG weight | 600 lbs | 400 lbs |
| Estimated Cost to install | 600 lbs $\times$ \$1.92/lb $=$ \$1,152 | $400 \mathrm{lbs} \times \$ 1.92=\$ 768$ |
| Estimated Cost/Year | \$1,152/15 yrs. = \$76.80/yr. | \$768/15 yrs. $=$ \$51.29/yr. |
| Estimated Cost/Yr by mileage | $\begin{aligned} & \$ 76.80 / 100,000 \text { miles = } \\ & \$ .0008 / \text { mile } \end{aligned}$ | $\begin{aligned} & \$ 51.29 / 100,000 \text { miles = } \\ & \$ .0005 / \mathrm{mile} \end{aligned}$ |


| FREIGHT RATE: <br> DAT.com's April 16th Trendlines Report shows current national van rate averages are at $\$ 2.10 /$ mile |  |  |
| :---: | :---: | :---: |
| Cost of added weight per mile formula is as follows: <br> (Rate/mile - cost of SUG/mile) x 100,000 miles <br> ESTIMATED REVENUE: <br> Freight Rate (\$2.10) x 100,000 miles $=\$ 210,000$ | $\begin{aligned} & (\$ 2.10 / \text { mile }-\$ .0008 / \mathrm{mile}= \\ & \$ 2.0992 / \mathrm{mile}) \times 100,000 \\ & \text { miles }=\$ 209,920 / \mathrm{yr} \end{aligned}$ <br> Decrease in Estimated Revenue: $\$ 210,000-\$ 209,920=\$ 80 / \mathrm{yr}$ | $(\$ 2.10 / \mathrm{mile}-\$ .0005 / \mathrm{mile}=$ $\$ 2.0995 / \mathrm{mile}$ ) x 100,000 miles $=\$ 209,950 / \mathrm{yr}$ <br> Decrease in Estimated Revenue: $\begin{aligned} & \$ 210,000-\$ 209,950= \\ & \$ 50 / \mathbf{y r} \end{aligned}$ |
| FUEL SAVINGS: <br> Estimated 6.5 mpg <br> 100,000 miles/yr / $6.5 \mathrm{mpg}=$ 15,385 gallons/yr. <br> 15,385 gallons/yr x \$4/gallon $=\$ 61,540 / \mathrm{yr}$ <br> Estimated increase in mpg due to aerodynamics from SUG system $=.08 \mathrm{mpg}$ | Estimated Increase in mpg: $\begin{aligned} & 6.5 \mathrm{mpg}+.08 \mathrm{mpg}=6.58 \\ & \mathrm{mpg} \\ & 100,000 \mathrm{miles} / \mathrm{yr} / 6.58 \mathrm{mpg}= \\ & 15,198 \text { gallons } / \mathrm{yr} \\ & 15,198 \text { gallons } / \mathrm{yr} \times \$ 4 / \mathrm{gallon} \\ & =\$ 60,792 / \mathrm{yr} \end{aligned}$ <br> Difference $=$ Fuel Savings $\$ 61,540 / \mathrm{yr}-\$ 60,792 / \mathrm{yr}=$ $\$ 748 / \mathrm{yr} .$ | Estimated Increase in mpg: $\begin{aligned} & 6.5 \mathrm{mpg}+.08 \mathrm{mpg}=6.58 \\ & \mathrm{mpg} \\ & 100,000 \mathrm{miles} / \mathrm{yr} / 6.58 \mathrm{mpg} \\ & =15,198 \text { gallons } / \mathrm{yr} \\ & 15,198 \text { gallons } / \mathrm{yr} \times \$ 4 / \mathrm{gallon} \\ & =\$ 60,792 / \mathrm{yr} \end{aligned}$ |
| ESTIMATED INCREASED REVENUE: <br> Fuel Savings - Loss of Freight Revenue | Fuel Savings - Loss of Freight Revenue = <br> Estimated Increased Revenue with SUG: <br> \$748-\$80 = \$668/yr | Fuel Savings - Loss of Freight Revenue = <br> Estimated Increased Revenue with SUG: <br> \$748-\$50 = \$698/yr |
| ESTIMATED INCREASED REVENUE OVER THE LIFE OF THE TRAILER: <br> Estimated Increased Revenue with SUG x 15 years | Estimated Increased Revenue with SUG: \$748-\$80 = \$668/yr $\$ 668 / \mathrm{yr} \times 15 \mathrm{yrs}=$ $\$ 10,020$ | Estimated Increased Revenue with SUG: \$748-\$50 = \$698/yr $\$ 698 / \mathrm{yr} \times 15 \mathrm{yrs}=$ $\$ 10,470$ |

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