

February 10, 2004

**SUBJECT: Comparison of Vehicle Trip Forecasts for Big Box Stores**

At your request, I have prepared a series of comparisons of the amount of weekly traffic typically generated by discount superstores (e.g. Super Wal-Mart), discount clubs (e.g. Costco), and home improvement superstores (e.g. Home Depot). The traffic volume estimates in this letter are based on studies compiled by the Institute of Transportation Engineers (ITE) in Trip Generation, 7<sup>th</sup> Edition. This publication is the definitive source for estimating trips generated from different land use types. This edition was recently updated in late 2003 to include recent traffic studies conducted over the last six years. The information provided in this letter includes total daily trips by the day of the week and total weekly trips.

ITE's complete descriptions of these three land uses together with the various traffic data plots from Trip Generation, 7<sup>th</sup> Edition are enclosed for your information. My summaries and examples of these definitions are as follows:

- ❖ Discount Superstore (ITE Land Use Code 813) – free standing discount stores offering a variety of customer services with a wide range of products that also contain a full service grocery department under the same roof; (e.g. Super Wal-Mart)
  
- ❖ Discount Club (ITE Land Use Code 861) – discount store or warehouse where shoppers pay a membership fee with discounted prices on items such as food, clothing, tires, and appliances; (e.g. Costco)
  
- ❖ Home Improvement Superstore (ITE Land Use Code 862) – free standing facilities that specialize in the sale of home improvement merchandise such as lumber, tools, paint, lighting, wallpaper and paneling, kitchen and bathroom fixtures, lawn equipment and plant and garden accessories; (e.g. Home Depot)

Table 1 below provides the trip rates per 1,000 square feet for a free standing discount superstore with an assumed store size of 200,000 square feet using the data provided in Trip Generation, 7<sup>th</sup> Edition. The fitted curve equations have been used for weekdays and Saturdays as the points in the data plot near the store size of 200,000 square feet are closer to the fitted curve line than they are to the weighted average line. In fact as shown in the data plots, nearly all of the data points are above the fitted curve line for stores in the upper end of the data

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range, indicating even these fitted curves may understate the number of trips for the larger stores. In addition, the following table also provides both the low and the high ends of the range of trip rates for weekdays, Saturdays, and Sundays.

**Table 1**  
**Trip Rates from Land Use 813 (Free Standing Discount Superstore)**  
**For An Assumed Store Size of 200,000 Square Feet**

|               | Number of Studies | Average Trip Rate | Low End of Range of Rates | High End of Range of Rates |
|---------------|-------------------|-------------------|---------------------------|----------------------------|
| Weekday Rate  | 10                | 74.12(X) – 3,977* | 29.65                     | 64.03                      |
| Saturday Rate | 10                | 84.74(X) - 4,347* | 35.32                     | 73.61                      |
| Sunday Rate   | 10                | 46.98             | 27.61                     | 70.21                      |

Source: Institute of Traffic Engineers, Trip Generation, 7<sup>th</sup> Edition.

\* indicates fitted curve equation was used instead of average trip rate

X indicates store size in 1,000 square feet

Table 2 below provides a comparison of trips associated with a discount superstore of 200,000 square feet for weekdays, Saturdays, and Sundays using the average trip rates described above as well as for the low and high ends of the range of trip rates published by ITE in Trip Generation, 7<sup>th</sup> Edition.

**Table 2**  
**Daily/Weekly Trips from Land Use 813 (Free Standing Discount Superstore)**  
**For An Assumed Store Size of 200,000 Square Feet**

|                     | Number of Studies | Average Trip Rate | Low End of Range of Rates | High End of Range of Rates |
|---------------------|-------------------|-------------------|---------------------------|----------------------------|
| Weekday Trips       | 10                | 10,847*           | 5,930                     | 12,806                     |
| Saturday Trips      | 10                | 12,601*           | 7,064                     | 14,722                     |
| Sunday Trips        | 10                | 9,396             | 5,522                     | 14,054                     |
| <b>Weekly Trips</b> |                   | <b>76,232</b>     | <b>42,236</b>             | <b>92,806</b>              |

Source: Institute of Traffic Engineers, Trip Generation, 7<sup>th</sup> Edition.

\* indicates fitted curve equation was used instead of average trip rate

Table 3 below provides the trip rates per 1,000 square feet for a discount club with an assumed store size of 136,000 square feet. Trip rates for weekdays, Saturdays, and Sundays are shown using the data provided in Trip Generation, 7<sup>th</sup> Edition. The weighted average trip rates have been used in all three cases as fitted curve equations have not been developed by ITE for this land use. In addition, the following table also provides both the low and the high ends of the range of trip rates for weekdays, Saturdays, and Sundays.

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**Table 3**  
**Trip Rates from Land Use 861 (Discount Club)**  
**For An Assumed Store Size of 136,000 Square Feet**

|               | Number of Studies | Average Trip Rate | Low End of Range of Rates | High End of Range of Rates |
|---------------|-------------------|-------------------|---------------------------|----------------------------|
| Weekday Rate  | 19                | 41.80*            | 25.44                     | 78.02                      |
| Saturday Rate | 16                | 53.75*            | 31.96                     | 82.43                      |
| Sunday Rate   | 8                 | 33.67*            | 17.17                     | 61.79                      |

Source: Institute of Traffic Engineers, Trip Generation, 7<sup>th</sup> Edition.

\* indicates average rate was used as fitted curve equation was not given

Table 4 below provides a comparison of trips associated with a discount club of 136,000 square feet for weekdays, Saturdays, and Sundays using the average trip rates described above as well as for the low and high ends of the range of trip rates published by ITE in Trip Generation, 7<sup>th</sup> Edition.

**Table 4**  
**Daily/Weekly Trips from Land Use 861 (Discount Club)**  
**For An Assumed Store Size of 136,000 Square Feet**

|                     | Number of Studies | Average Trip Rate | Low End of Range of Rates | High End of Range of Rates |
|---------------------|-------------------|-------------------|---------------------------|----------------------------|
| Weekday Trips       | 19                | 5,685*            | 3,460                     | 10,611                     |
| Saturday Trips      | 16                | 7,310*            | 4,347                     | 11,210                     |
| Sunday Trips        | 8                 | 4,579*            | 2,335                     | 8,403                      |
| <b>Weekly Trips</b> |                   | <b>40,314</b>     | <b>23,982</b>             | <b>72,668</b>              |

Source: Institute of Traffic Engineers, Trip Generation, 7<sup>th</sup> Edition.

\* indicates average rate was used as fitted curve equation was not given

Table 5 below provides the trip rates per 1,000 square feet for a home improvement superstore with an assumed store size of 108,000 square feet. Average trip rates for weekdays, Saturdays, and Sundays are shown using the data provided in Trip Generation, 7<sup>th</sup> Edition. The fitted curve equation has been used for weekdays as the points in the data plot near the assumed store size of 108,000 square feet are closer to the fitted curve line than they are to the

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weighted average line. In addition, the following table also provides both the low and the high ends of the range of trip rates for weekdays and Saturdays.

**Table 5**  
**Trip Rates from Land Use 862 (Home Improvement Superstore)**  
**For An Assumed Store Size of 108,000 Square Feet**

|               | Number of Studies | Average Trip Rate                            | Low End of Range of Rates | High End of Range of Rates |
|---------------|-------------------|--|---------------------------|----------------------------|
| Weekday Rate  | 9                 | $\text{Ln}(T) = 0.70(\text{Ln}(X) + 4.85^*)$ | 18.35                     | 39.31                      |
| Saturday Rate | 2                 | 45.67  | 34.77                     | 49.99                      |
| Sunday Rate   | 1                 | 20.93  | Not given                 | Not given                  |

Source: Institute of Traffic Engineers, Trip Generation, 7<sup>th</sup> Edition.

\* indicates fitted curve equation was used instead of average trip rate  
 Ln indicates logarithmic relationship where T is number of trips and X is store size in 1,000 square feet

Table 6 below provides a comparison of trips associated with a home improvement superstore of 108,000 square feet for weekdays and Saturdays using the average trip rates described above as well as for the low and high ends of the range of trip rates published by ITE in Trip Generation, 7<sup>th</sup> Edition.

**Table 6**  
**Daily/Weekly Trips from Land Use 862 (Home Improvement Superstore)**  
**For An Assumed Store Size of 108,000 Square Feet**

|                     | Number of Studies | Average Trip Rate | Low End of Range of Rates | High End of Range of Rates |
|---------------------|-------------------|-------------------|---------------------------|----------------------------|
| Weekday Trips       | 9                 | 3,386*            | 1,982                     | 4,245                      |
| Saturday Trips      | 2                 | 4,932             | 3,755                     | 5,399                      |
| Sunday Trips        | 1                 | 2,260             | Not given                 | Not given                  |
| <b>Weekly Trips</b> |                   | <b>24,122</b>     |                           |                            |

Source: Institute of Traffic Engineers, Trip Generation, 7<sup>th</sup> Edition.

\* indicates fitted curve equation was used instead of average trip rate  
 In comparing the tables above for discount superstores and discount clubs, and using the average trip rates for the assumed store sizes, a discount superstore would be expected to generate over 76,000 trips during a week, nearly double the 40,000 trips generated by a discount club. Using the low end of the range of rates, a discount superstore would be expected to generate over 42,000 trips during a week, more than 75 percent higher than the 24,000 trips generated by a

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discount club at the low end of the range of rates. Using the high end of the range of rates, a discount superstore would be expected to generate nearly 93,000 trips during a week, over 25 percent higher than the 73,000 trips generated by a discount club at the high end of the range of rates.

In comparing the tables above for discount superstores and home improvement superstores, and using the average trip rates for the assumed store sizes, a discount superstore would be expected to generate over 76,000 trips during a week, more than triple the 24,000 trips generated by a home improvement superstore.

Respectfully submitted,

**Tom Brohard and Associates**

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