Impact Fees Based on ITE Trip Generation - Cautions

March 9, 2016
W. Lafayette, IN

Presented by:
Eric J. Tripi, P.E., PTOE
Agenda

- Trip Generation Resources
- Basic of ITE Trip Generation
- Traffic Impact Fees – Two Case Studies
- Final Thoughts

…Questions
Trip Generation Resources
Trip Generation Resources

  - Volumes 2 and 3 – Data
Trip Generation Resources

- Trip Generation Handbook, 2\textsuperscript{nd} Edition: An ITE Recommended Practice, 2004

- Trip Generation Handbook, 3\textsuperscript{rd} Edition: An ITE Recommended Practice, 2014
Basics of ITE Trip Generation
Basics of ITE Trip Generation

- Who is ITE
  - Institute of Transportation Engineers
  - Founded in 1930
  - Nearly 17,000 members in 92 countries
  - Over 90 local chapters and 130 student organizations
  - Educational and Scientific organization
Basics of ITE Trip Generation

- What is Trip Generation?
  - The estimated peak hour and daily site traffic volumes for a particular land use.
  - Involves development of relationships between vehicle trips and land use characteristics
Basics of ITE Trip Generation

- ITE Trip Generation
  - Data assembled from more than 4,800 individual studies in United States and Canada since the 1960s
  - Mainly collected at suburban locations
    - With limited transit service
    - Without nearby pedestrian amenities
    - Without travel demand management (TDM) programs
  - Data received on “voluntary” basis
Trip Generation Uses

- Regional studies
  - Considers land use and socio-economic characteristics
- Site impact analysis
  - Analysis of trip generation of specific land uses
- Zoning and land use planning applications
- Sizing transportation system and individual facilities
- Impact fee determination
- Environmental assessment
  - Traffic impacts on air and noise
Basics of ITE Trip Generation

- Definitions
  - *Pass-by trip* – intermediate stop on way from origin to primary destination
  - *Primary trip* – made for specific purpose of visiting generator
  - *Diverted Trip* – attracted from traffic volumes on roadways within vicinity of generator but without direct access to site
Basics of ITE Trip Generation

- **A Trip or Trip End**
  - Single or one-directional vehicle movement to or from a site/area
  - One-way movement

- **Total Trip Ends**
  - Total of all trips entering and exiting a site during a designated time period

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**Peak-Hour Trip Generation**
- 50 entering trips
- 150 exiting trips
- 200 total trip ends per hour

**Office Development**
Basics of ITE Trip Generation

- **Primary trips**
  - Main reason for a trip
  - Upon exit, trips will travel back in the direction from which they came

- **Pass-by trips**
  - Trips made as an intermediate stop
  - Upon exit, trips will continue to travel in the same direction they were traveling before stopping at the site
  - NOT a NEW trip
Basics of ITE Trip Generation

- Diverted Trips
  - Trips that are diverted from nearby roadways and required to use another roadway to access site
  - Adds traffic to streets directly adjacent to development site - not to nearby major roadways
  - Direction of travel upon exit may be similar to that of pass-by trips
  - Difficult to identify
Primary trips are the main reasons for the trip.

LEGEND
- Trips Prior to Visiting the Development
- Trips After Visiting the Development
- Primary Trip
- Pass-By Trip
- Diverted-Link Trip

Diverted-link trips are attracted from the passing traffic on nearby roadways but require a diversion from the intended travel path.
Traffic Impact Fees – Two Case Studies
Traffic Impact Fees – Two Case Studies
What is a Traffic Impact Fee?

- Traffic Impact Fee – *used for new development and intensified land uses that will fund transportation improvements such as new sidewalks, crosswalks, traffic signal upgrades, transit, and bicycle facilities that are necessitated by the new trips associated with land use change.*

  City of Santa Monica Planning and Community Development
Berkeley County, SC has an Impact Fee Ordinance

- Two existing businesses wished to build new facilities in Berkeley County, SC
- Each owner was assessed an Impact Fee they were not happy about...
- ...so we were called to assess the situation.
Impact Fee Calculation:

\[ \text{Impact Fee} = (\text{NNWT}) \times (\text{TED}) \times (\text{COST}) \times (\text{CDR}) \]

Where:
- **NNWT**: Net New Weekday Trips (includes pass-by and capture trip reductions)
- **TED**: Trip end discount of 50%
- **COST**: Cost per trip for Service Zone 1, $402.25
- **CDR**: Per County Council Policy – 70% of maximum allowable impact fee will be charged (85% for Independent Studies).
### Exhibit B
General Transportation Impact Fee Schedule - Service Zone 1

#### Berkeley County, SC Impact Fee Ordinance

<table>
<thead>
<tr>
<th>Type of Land Use</th>
<th>ITE Code</th>
<th>Daily Trip Generation Rate</th>
<th>Pass-by Percentage</th>
<th>Discounted Impact Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Residential</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Family (per dwelling unit)</td>
<td>230</td>
<td>3.07</td>
<td>0%</td>
<td>$1,016</td>
</tr>
<tr>
<td>Apartment (per dwelling unit)</td>
<td>230</td>
<td>6.72</td>
<td>0%</td>
<td>$1,016</td>
</tr>
<tr>
<td>Condominium/Townhome (per dwelling unit)</td>
<td>230</td>
<td>3.06</td>
<td>0%</td>
<td>$1,016</td>
</tr>
<tr>
<td>Mobile Home Park (per occupancy) (dwellings unit)</td>
<td>230</td>
<td>4.98</td>
<td>0%</td>
<td>$1,122</td>
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<tr>
<td>Senior Adult Housing (per occupancy) (dwellings unit)</td>
<td>230</td>
<td>2.71</td>
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<td>$1,016</td>
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<tr>
<td>Congregate Care Facility (per occupancy)</td>
<td>334</td>
<td>2.01</td>
<td>0%</td>
<td>$1,344</td>
</tr>
<tr>
<td>Hotel (per occupancy room)</td>
<td>318</td>
<td>8.92</td>
<td>6%</td>
<td>$1,216</td>
</tr>
<tr>
<td><strong>Commercial</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Golf Course (per hole)</td>
<td>430</td>
<td>19.05</td>
<td>0%</td>
<td>$2,012</td>
</tr>
<tr>
<td>Multiple Use/Threat (per 1,000 sf)</td>
<td>415</td>
<td>22.66</td>
<td>0%</td>
<td>$6,000</td>
</tr>
<tr>
<td>Health/institution (per 1,000 sf)</td>
<td>452</td>
<td>22.95</td>
<td>0%</td>
<td>$6,000</td>
</tr>
<tr>
<td>Bowling Alley (per 1,000 sf)</td>
<td>518</td>
<td>33.53</td>
<td>0%</td>
<td>$4,092</td>
</tr>
<tr>
<td><strong>Schools</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary School (per 1,000 sf)</td>
<td>520</td>
<td>10.19</td>
<td>0%</td>
<td>$2,012</td>
</tr>
<tr>
<td>Middle School (per 1,000 sf)</td>
<td>522</td>
<td>13.78</td>
<td>0%</td>
<td>$3,012</td>
</tr>
<tr>
<td>High School (per 1,000 sf)</td>
<td>526</td>
<td>12.49</td>
<td>0%</td>
<td>$3,012</td>
</tr>
<tr>
<td>Juvenile Detention Center (per 1,000 sf)</td>
<td>540</td>
<td>27.49</td>
<td>0%</td>
<td>$5,875</td>
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<tr>
<td>University/College (per 1,000 sf)</td>
<td>576</td>
<td>2.38</td>
<td>0%</td>
<td>$1,016</td>
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<tr>
<td>Church (per 1,000 sf)</td>
<td>594</td>
<td>9.11</td>
<td>0%</td>
<td>$1,262</td>
</tr>
<tr>
<td>Daycare (per student)</td>
<td>507</td>
<td>4.18</td>
<td>0%</td>
<td>$1,016</td>
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<tr>
<td><strong>Medical</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital (per bed)</td>
<td>610</td>
<td>11.81</td>
<td>0%</td>
<td>$1,016</td>
</tr>
<tr>
<td>Clinic (per employee)</td>
<td>610</td>
<td>7.74</td>
<td>0%</td>
<td>$1,016</td>
</tr>
<tr>
<td>Urgent Care Center (per bed)</td>
<td>620</td>
<td>2.37</td>
<td>0%</td>
<td>$1,016</td>
</tr>
<tr>
<td><strong>Retail</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Office (per 1,000 sf)</td>
<td>710</td>
<td>15.65</td>
<td>0%</td>
<td>$2,200</td>
</tr>
<tr>
<td>&lt; 50,000 sf</td>
<td>710</td>
<td>15.65</td>
<td>0%</td>
<td>$2,200</td>
</tr>
<tr>
<td>50,000 - 100,000 sf</td>
<td>710</td>
<td>15.65</td>
<td>0%</td>
<td>$2,200</td>
</tr>
<tr>
<td>&gt; 200,000 sf</td>
<td>710</td>
<td>15.65</td>
<td>0%</td>
<td>$2,200</td>
</tr>
<tr>
<td><strong>Industrial</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Light Industrial (per 1,000 sf)</td>
<td>820</td>
<td>16.66</td>
<td>4%</td>
<td>$3,093</td>
</tr>
<tr>
<td>General Heavy Industrial (per 1,000 sf)</td>
<td>820</td>
<td>16.66</td>
<td>4%</td>
<td>$3,093</td>
</tr>
<tr>
<td>Automotive Repair (per 1,000 sf)</td>
<td>820</td>
<td>33.33</td>
<td>0%</td>
<td>$1,016</td>
</tr>
</tbody>
</table>

#### Notes:
- Drive-In Retail (per 1,000 sf) | 110 | 6.97 | 0% | $1,981
- Gas Station w/ Convenience Store (per pump) | 912 | 29.4 | 6% | $1,113
- High Turnover 1st Floor Restaurant (per 1,000 sf) | 912 | 127.35 | 5% | $1,200
- Fast Food w/ Drive-Through Window (per 1,000 sf) | 912 | 127.35 | 5% | $1,200
- Automotive Repair (per 1,000 sf) | 110 | 6.97 | 0% | $1,981

#### Impact Fees:
- **General Office (per 1,000 sf)**
  - < 50,000 sf | $2,200
  - 50,000 - 100,000 sf | $2,200
  - > 200,000 sf | $2,200

- **General Retail (per 1,000 sf)**
  - < 50,000 sf | $3,093
  - 50,000 - 100,000 sf | $3,093
  - > 200,000 sf | $3,093

- **Industrial**
  - General Light Industrial (per 1,000 sf) | $1,981
  - General Heavy Industrial (per 1,000 sf) | $1,981
  - Automotive Repair (per 1,000 sf) | $1,113

- **Miscellaneous**
  - Drive-In Retail (per 1,000 sf) | $1,981
  - Gas Station w/ Convenience Store (per pump) | $1,981
  - High Turnover 1st Floor Restaurant (per 1,000 sf) | $1,200
  - Fast Food w/ Drive-Through Window (per 1,000 sf) | $1,200
  - Automotive Repair (per 1,000 sf) | $1,981

- **Discounted Impact Fee**
  - $2,204
  - $2,006
  - $1,711
  - $1,601
Two Independent Impact Fee Studies

- What kind of land use is this?
  - Sells motorcycles, watercrafts, ATV’s, utility vehicles
  - Sells parts
  - Provides on-site service
  - Typically low number of employees (<20)
  - Building space dedicated to showroom, service area, and storage
SITE #1

- Existing Site Characteristics
  - Building – 5,000 sf, with additional 1,250 sf of storage outside the building
  - 7 employees
  - Open 10AM-6PM, Mon-Sat

- Future Site Characteristics
  - 17,000 sf
  - 7 Employees
  - Open 10AM-6PM, Mon-Sat
SITE #2

- **Existing Site Characteristics**
  - Building – 9,950 sf, with additional 15,820 sf of storage outside the building
  - 15 employees
  - Open 9AM-6PM, Mon-Sat

- **Future Site Characteristics**
  - 43,559 sf
  - 15 Employees
  - Open 9AM-6PM, Mon-Sat

**Two Independent Impact Fee Studies**
Two Independent Impact Fee Studies

- Site #1
  - Assessed $41,700 in impact fees based on existing Berkeley County Ordinance methodologies

- Site #2
  - Assessed $126,000 in impact fees
Impact Fee Calcs for Site #1 (per County Ordinance):

17,000 Square Feet of Future Building Area

Apportioned:
11,000sf = Warehouse (11 x 4.96 = 55 Trips)
5,000sf = Retail (5 x 86.56 = 433 Daily Trips x .52 Pass-by = 225 Trips)
1,000sf = Office (1 x 15.65 = 16 Trips)

NNWT = Net New Weekday Trips (296 Trips)

Impact Fee = (NNWT) x (TED) x (COST) x (CDR)
= (296) x (0.50) x (402.25) x (0.70) = $41,673

Total Fee = $41,673
## Two Independent Impact Fee Studies

<table>
<thead>
<tr>
<th>Type of Land Use²</th>
<th>ITE Code</th>
<th>Daily Trip Generation Rate³</th>
<th>Pass-by Percentage⁴</th>
<th>Discounted Impact Fee⁵</th>
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<tbody>
<tr>
<td><strong>General Office (per 1,000 sf)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 50,000 sf</td>
<td>710</td>
<td>15.65</td>
<td>0%</td>
<td>$2,204</td>
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<tr>
<td>50,000 – 100,000 sf</td>
<td>710</td>
<td>14.25</td>
<td>0%</td>
<td>$2,006</td>
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<tr>
<td>100,001 – 200,000 sf</td>
<td>710</td>
<td>12.15</td>
<td>0%</td>
<td>$1,711</td>
</tr>
<tr>
<td>&gt; 200,000 sf</td>
<td>710</td>
<td>11.37</td>
<td>0%</td>
<td>$1,601</td>
</tr>
<tr>
<td><strong>General Retail (per 1,000 sf)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 50,000 sf</td>
<td>820</td>
<td>86.56</td>
<td>48%</td>
<td>$6,337</td>
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<tr>
<td>50,000 – 100,000 sf</td>
<td>820</td>
<td>75.10</td>
<td>42%</td>
<td>$6,090</td>
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<tr>
<td>100,001 – 200,000 sf</td>
<td>820</td>
<td>58.92</td>
<td>35%</td>
<td>$5,417</td>
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<tr>
<td>&gt; 200,000 sf</td>
<td>820</td>
<td>53.28</td>
<td>32%</td>
<td>$5,101</td>
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<tr>
<td><strong>Industrial</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Light Industrial (per 1,000 sf)⁷</td>
<td>110</td>
<td>6.97</td>
<td>0%</td>
<td>$981</td>
</tr>
<tr>
<td>General Heavy Industrial (per 1,000 sf)⁷</td>
<td>120</td>
<td>1.5</td>
<td>0%</td>
<td>$211</td>
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<tr>
<td>Industrial Park (per 1,000 sf)⁷</td>
<td>130</td>
<td>6.96</td>
<td>0%</td>
<td>$980</td>
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<tr>
<td>Warehousing (per 1,000 sf)⁷</td>
<td>150</td>
<td>4.96</td>
<td>0%</td>
<td>$699</td>
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<tr>
<td>Mini-Warehouse (per 1,000 sf)⁷</td>
<td>151</td>
<td>2.5</td>
<td>0%</td>
<td>$352</td>
</tr>
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</table>
Two Independent Impact Fee Studies

- Data Collection for Independent Study (per Berkeley County Ordinance)
  - Surveyed Ins/Outs of existing sites during business hours
  - Study conducted on an average weekday (Tuesday-Thursday) for two different weeks
  - Classified number of Motorcycles versus Cars/Trucks trips
Two Independent Impact Fee Studies

- Conclusions of Site #1 Independent Study

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<tr>
<th>VEHICLE TYPE</th>
<th>IN</th>
<th>OUT</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car/Truck</td>
<td>29</td>
<td>29</td>
<td>58</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>11</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40</td>
<td>40</td>
<td>80</td>
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<table>
<thead>
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<th>VEHICLE TYPE</th>
<th>IN</th>
<th>OUT</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car/Truck</td>
<td>34</td>
<td>34</td>
<td>68</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>35</td>
<td>35</td>
<td>70</td>
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Average Daily Trips | 38 | 38 | 76 |
Conclusions of Site #1 Independent Study

- 76 average daily trips
- Conservative assumption that 25% of the trips are pass-by in nature
- NNWT value of 76 x 0.75 = 57 was used (vs. 296)
- The Impact Fee becomes:

\[
\text{Impact Fee} = (57) \times (0.50) \times ($402.25) \times (0.85) = $9,744.51
\]

A $33,000 Savings...
BUT WAIT….THE NEW BUILDING IS BIGGER!!!

Doesn’t this mean there will be more trips?

Not necessarily…

- Number of Employees to remain the same
- Much of the increased space being used for storage and workshop
- No new services offered
- Hours of operation remain the same
BUT WAIT AGAIN….YOU DIDN’T THINK IT WOULD BE THAT EASY DID YA?
County Comments/Recommendations for Site #1 Study:

- 25% Pass-by assumption ok
- Insisted the site would generate additional trips with larger building
- Compromise: assume existing building square footage is 50% bigger
- Thus NNWT value increases to 117.97
- The Impact Fee becomes:
  \[
  \text{Impact Fee} = (117.97) \times (0.50) \times (402.25) \times (0.85) = 20,167.71
  \]
  Still a $21,410 Savings
Final Agreement

SITE #2

- Existing Site Characteristics
  - Building – 9,950 sf, with additional 15,820 sf of storage outside the building
  - 15 employees
  - Open 9AM-6PM, Mon-Sat

- Future Site Characteristics
  - 43,559 sf
  - 15 Employees
  - Open 9AM-6PM, Mon-Sat
Final Agreement

- Conclusions of Site #2 Independent Study

<table>
<thead>
<tr>
<th>VEHICLE TYPE</th>
<th>IN</th>
<th>OUT</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car/Truck</td>
<td>109</td>
<td>111</td>
<td>220</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>20</td>
<td>19</td>
<td>39</td>
</tr>
<tr>
<td>Total</td>
<td>129</td>
<td>130</td>
<td>259</td>
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<table>
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<th>OUT</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car/Truck</td>
<td>129</td>
<td>129</td>
<td>258</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>6</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>135</td>
<td>135</td>
<td>270</td>
</tr>
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</table>

**Daily Trips (Average February)**

<p>| | | | |</p>
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<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Trips</td>
<td>132</td>
<td>133</td>
<td>265</td>
</tr>
</tbody>
</table>

**Daily Trips (Average Month)**

<p>| | | | |</p>
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<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Trips</td>
<td>161</td>
<td>162</td>
<td>323</td>
</tr>
</tbody>
</table>
Final Agreement

- Conclusions of Site #2 Independent Study
  - 323 average daily trips
  - Conservative assumption that 25% of the trips are pass-by in nature
  - Assumed existing square footage was 50% higher (per prior study County recommendation)
  - NNWT value of 316 was used.
  - The Impact Fee becomes:
    \[
    \text{Impact Fee} = (316) \times (0.50) \times ($402.25) \times (0.85) = $54,022.18
    \]

A $72,000 Savings
Final Agreement

- County Comments/Recommendations on Site #2 Study:
  - 25% Pass-by assumption ok
  - Compromise: assume existing building square footage is 20% bigger (on top of the 50% increase)
  - Thus NNWT value increases to 380
  - The Impact Fee becomes:
    \[
    \text{Impact Fee} = (380) \times (0.50) \times ($402.25) \times (0.85) = $64,963.38
    \]
    Still a $61,000 Savings
Final Thoughts

- Moral of Story:

ITE Trip Generation used to calculate Impact Fees needs to be carefully reviewed – especially for small unique developments.
Questions?

Thank You!

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E-Mail: eric.tripi@parsons.com