

Impact Fee Study

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Intro

Impact fees are an extraction against new development for the purpose of ensuring that growth-required expansion of capital assets is funded by that new growth. There are two overriding concerns in the management of impact fees: (1) the fee schedule is proportionate to demand created by new growth and (2) fee payers (e.g. the entities responsible for new growth) enjoy the benefits of this extraction. The first item essentially ensures that new growth pay only for an incremental expansion of the current capital asset inventory. No attempt should be made to improve the current level of service – only expand the current level of service in a manner that is directly proportionate to the need created by new growth. The second concern focuses on ensuring that collected fees are spent in a timely manner and in a way that ensures that new growth enjoys the benefits of expanding the capital asset inventory. For detailed discussion concerning the legal issues involving impact fees see Nelson (1988) and Nicholas, et al (1991).

To satisfy the first concern, impact fees are rationally determined. This process generally involves dividing the current capital asset inventory by some demand generator. The result is a fee that represents cost to expand inventory per demand unit. In the case of an education impact fee, the capital asset inventory comprises the buildings and land owned by a board of education. The demand unit is students, traditionally expressed as students per household.

Jefferson County, West Virginia, has employed an educational/school impact fee since January 2004. The traditional approach to the demand generator component has been expressed as school-aged children per housing unit type. Fee studies conducted in 1990, 2003, and 2006 all expressed demand generators by housing unit type: Single Family Detached, Town Home/Duplex, and Multifamily Apartment. Table 1 outlines the demand generator data used in those studies.

Table 1. Pupil Generation by Housing Unit Type, Jefferson County WV

Type	Elementary	Middle	High	All Grades
Single	0.24	0.13	0.13	0.5
Duplex/Townhome	0.244	0.068	0.068	0.38
Multi-family	0.18	0.05	0.05	0.28

Source: Jefferson County School Impact Fee Study, 2003. TischlerBise.

The past ten years have witnessed a change in the way communities assess a residential impact fee. Like Jefferson County, the approach had been to recognize various housing unit types. This approach meant that very small detached housing units (such as mobile homes and cottages) paid a residential impact fee which was identical to a 5,000 square foot detached dwelling unit. In many communities, data from the US Bureau of the Census now point to the fact that smaller dwelling units of any type have fewer occupants than larger dwelling units of any type. Thus, in several communities fee schedules are being realigned to assess a residential impact fee based on housing unit size or by the number of bedrooms. For a detailed review of these studies and the underlying approach see Nelson, et al (2008).

Although a shift toward a fee schedule based on housing unit size has positive benefits from the perspective of encouraging affordable housing, jurisdictions are cautioned to simply draw up a fee schedule based on unit size. As previously mentioned, impact fees are rationally determined and whichever demand generator is used in the fee determination, it should be based on sound data and a clear trend.

The present study is an attempt to determine whether such a trend now exists in Jefferson County, West Virginia. A significant difference between this current approach and all previous approaches is the availability of local data. Only recently has it been possible to merge data sets from the Board of Education, the Jefferson County GIS/Addressing Office, and the Jefferson County Assessor's office. By choosing select common fields between these three data sets, a study of pupil generation by housing unit size, type, or number of bedrooms is possible. Prior to this, fee studies were forced to use US Bureau of the Census data, but determining pupil generation by housing unit size would not have been a possibility.

Methodology

To obtain that data required by the contractor, it was necessary to merge three datasets: 911 Addressing data which contained all physical address and some site type data for the county; Tax Assessor data which contained all parcel data, including land use and building area (sq ft), for the county; and Board of Education data which contained all physical address data for school children in the county. All three datasets needed to be reviewed and prepared for merging. This was done by three different departments: the Department of Capital Planning and Management, the Tax Assessor's Office, and the GIS/Addressing Office.

Choosing classification schema

Prior to the merging of data, it was important to determine the site types and land use codes which would be used in the study. Since this study focused on structures where children live, only addresses for Residential structures were needed. Listed below are the site types/land use codes chosen to represent Residential structures.

911 Addressing Site Types:

- R1 (Single Family)
- R2 (Multi Family)
- R3 (Mobile Home)

Tax Assessor Land Use Codes:

- Active Farm
- Inactive Farm
- Mobile Home
- Residential_1_family (Standard single family house or Doublewide on real estate owned by the person living in the Doublewide)
- Residential_2_family (Duplex or single family with an apartment, in-law suite, etc)
- Residential_3_family (Triplex or a house converted to apartments)
- Residential_4_family (Quad or a house converted to apartments)

It was decided that the 911 Addressing data contained the most accurate classification of addresses; however, only 50% of the address points were classified. The Tax Assessor codes were utilized to 'fill in the gaps' where the 911 Addressing data was not yet classified.

Initial Preparation of Data

The three main datasets needed to be prepared prior to merging. The processes used to prepare the datasets for the study are described below.

Board of Education Data (Department of Capital Planning and Management)

The first data set was derived from the transportation records maintained by the Jefferson County Board of Education. This Microsoft Excel table matched the physical location address with the number of students by grade living at that address. The physical location address constituted the actual dwelling unit address, not the address or location of a school bus pickup/drop off point.

The Board of Education dataset was prepared for data integration as follows:

Step 1: Eliminate Non-Student Addresses

Though the BOE data was generated from the student transportation records, there were a few addresses that did not contain students, so the first step was to eliminate records where the total students at an address were zero.

Step 2: Merge Duplicate Addresses

The second step merged duplicate physical location addresses. In these cases, BOE staff had indicated that a duplicate address did represent two distinct records; thus, if 114 Main Street listed a single 3rd grade student in one record and another student in the 9th grade in the other record, there were in fact two students – a third and ninth grader at 114 Main Street. This step merged roughly 500 records.

Step 3: Match Address Data

The third step edited the physical location address syntax by eliminating extra spaces within the address field. This process was done to aid the merging of the BOE data set with the GIS/Addressing Office address data.

911 Addressing Data (GIS/Addressing Office)

The 911 Addressing dataset was prepared for data integration as follows:

Step 1: Remove all Non-Residential addresses

During this step, all addresses with a Non-Residential Site Type (i.e. Commercial, Church, Education, etc.) were removed from the dataset. Only those with a site type of Residential (R1, R2, R3) and those without a site type (<Null>) remained.

- Original Address Total = 25,185
- New address total = 23,927

Step 2: Review & Correct Site Types

All addresses containing STE (Suite) in secondary address field were removed, since the STE designation is only given to businesses. Also, all addresses containing APT (Apartment) in secondary address field were designated as R2. Additionally, all addresses in known Mobile Home Parks were reviewed and corrected to ensure they were properly coded as R3.

- New address total = 23,716
- By 911 Addressing Site Type:*
- <Null> = 12,532
 - R1 = 8,696
 - R2 = 1785
 - R3 = 705

Tax Assessor Data (Tax Assessor's Office)

The Integrated Assessment System's Data was prepared for data integration as follows:

Step 1: Import Parcel ID numbers

All parcel ID numbers for parcels which contained an addressable structure that had either a residential classification or no classification in the 911 Addressing data were imported into a new database table.

Step 2: Retrieve Residential Tax Codes

A query using the parcel ID table was run on the Integrated Assessment System's data to retrieve all residential tax codes for the existing parcels. This query generated a new table.

Step 3: Retrieve Commercial Tax Codes

A query was run on the Integrated Assessment System's data using the previous table to retrieve all commercial tax codes for the existing parcels. This query generated a new table.

Step 4: Retrieve Mobile Home Tax Codes

A query was run on the Integrated Assessment System's data using the previous table to retrieve all mobile home tax codes for the existing parcels. This query generated a new table.

Step 5: Data Review

After all queries were complete, the final table consisted of the tax information for all parcels, including tax parcel ID, tax code, and building area. This table was reviewed to ensure that there was only one record per parcel.

Spatial Join of 911 Addressing & Tax Assessor Data

Once all the preparations were complete, the data was ready to be merged. The first step was to merge the 911 Addressing data with the Tax Assessor data.

Step1: Spatial Join of datasets

During this step, the 911 Addressing dataset was combined with the Tax Assessor dataset using a spatial join. This allowed each address point to be labeled with the appropriate parcel information.

Step 2: Delete all unnecessary fields

Several fields within the new 911 Addressing/Tax Assessor dataset were deemed unnecessary to this study and were removed. Only the full address, site type, parcel ID, and land use codes were saved.

Step 3: Compile statistics on Tax codes reclassification of 911 Addressing <Null> values

Below are the statistics for the amount of <Null> values that were recalculated to match the Tax Assessor Land Use Codes.

- Total number of 911 Addressing <Null>s that have a Tax code = 10,023
By Tax Code:
- Active Farm = 636
- Inactive Farm = 140
- Mobile Home = 8
- Residential_1_family = 8,959
- Residential_2_family = 235
- Residential_3_family = 26
- Residential_4_family = 19

Step 4: Review of Tax Codes for <Null> values

This step was done to verify if the Tax Assessor codes contained a comparable context which would allow them to be utilized to calculate the 911 Addressing Site Types that had not yet been classified.

- Mobile Home, Residential_3_family, and Residential_4_family classes were given a detailed review using tax information and aerial photography and were found to be at least 70-80% similar.
- Active & Inactive Farm, Residential_1_family, and Residential_2_family were given a basic visual review and did not contain any <Null>s with secondary addresses; all records contained only a single root address. Though not a detailed review, it was determined that these classes comparable enough for the purposes of this study.

It was decided to calculate the 911 Addressing <Null>s to match the Tax Land Use Codes, utilizing the best of both available resources.

911 Addressing <Null>s were calculated as follows:

- Residential_1_family, Residential_2_family, Active Farm, Inactive Farm = R1 (Single Family)
- Residential_3_family, Residential_4_family = R2 (Multi Family)
- Mobile Home = R3 (Mobile Home)

Step 5: Compile final reclassification statistics

Below are the statistics for the final site type classifications.

- R1 = 18,664
- R2 = 1,830
- R3 = 713
- <Null> = 2,509 (these addresses did not have a classification in either the Addressing type field or the Tax code field; see **Final Statistics** section for details)

Tabular join of 911 Addressing /Tax Assessor & BOE data

Next, the BOE data was added.

Step 1: Initial Join to 911 Address/Tax Assessor layer

The original Board of Education data (post initial preparation) received from the Department of Capital Planning and Management contained 5,364 records. The data was combined with the 911 Addressing/Tax Assessor data using a tabular join. This process matched values in specified fields: in this case, the full address field in the 911 Addressing/Tax Assessor layer was matched to the BOE address field in the BOE table. This resulted in 4,695 records which matched the existing address data, with a loss of 669 records.

Data loss was the result of a variety of errors, including:

- BOE address did not exist in 911 Addressing/Tax Assessor data
- 911 Addressing/Tax Assessor data did/did not contain a secondary address, causing BOE data to not be matched
- Two BOE records contained the same address (only one of them was matched)
- Typographical errors in BOE data that were not caught in initial preparation

Step 2: Secondary BOE data clean-up

It was decided to run another quick review to clean up obvious errors, such as improper spelling of roads, use of symbols, etc. This process was done by visual comparison in the Access database.

Step 3: Final Join to 911 Address/Tax Assessor layer

After this final clean-up, the tables were again joined. This joining resulted in 4,831 matching records, with a loss of 533 records. The joined layer was exported to generate a new feature class containing the entire dataset.

Step 4: Compile Statistics

Once the tables were joined, statistics on Residential Addresses per site type and Residential Addresses w/ students per site type were compiled (see **Final Statistics** section).

Spatial Join to Major Subdivisions & Municipalities

In order to determine if the data was biased by priority of initial classification, it was decided to compile statistics on location of addresses based on the Major Subdivision and Jurisdiction Layers.

Step 1: Join 911 Address/Tax Assessor/BOE & Major Subdivision Layer

The 911 Addressing/Tax Assessor/BOE layer was combined with a layer of Major Subdivisions using a spatial join. This allowed all address points that fell within a major subdivision (defined as 4 or more lots) to be labeled with the name of that subdivision.

Step 2: Compile Statistics

Once the layers were joined, statistics on Residential Addresses per site type within Major Subdivisions and Residential Addresses w/ students per site type within Major Subdivisions were compiled (see **Final Statistics** section).

Step 3: Join 911 Address/Tax Assessor/BOE/Subdivision & Jurisdiction Layer

The 911 Addressing/Tax Assessor/BOE/Subdivision layer was then combined with a layer of containing Jurisdictions using a spatial join. This allowed the jurisdictional area (municipality or county) for each address to be assigned to the point.

Step 4: Compile Statistics

Once the layers were joined, statistics on Residential Addresses per site type within Jefferson County and Residential Addresses w/ students per site type within Jefferson County were compiled (see **Final Statistics** section).

Merging the data set with Building Area

Finally, the data was merged with the building area information retrieved in the initial Tax Assessor's data preparation.

The final data set contained 911 Address data along with each point's corresponding parcel ID, building area, and the number of students that live at that address.

Final Statistics

Since the study calls for addresses of all known residential units, the statistics generated below only contain information for 'Residential Addresses' which include all addresses designated as Single Family (R1), Multi Family (R2), or Mobile Home (R3). Any addresses which contain a Non-Residential site type/tax class or are not classified (<Null>) are not included in the statistics even if they matched an address provided by the Board of Education.

Residential Addresses

Out of the original 25,186 addressable structure points located countywide, only 21,207 were classified as Residential Addresses after the combination of the 911 Addressing & Tax Assessor datasets.

- Total Residential Addresses = 21,207
 - Total Single Family = 18,664 (88% of Total Res)
 - Total Multi Family = 1,830 (9% of Total Res)
 - Total Mobile Home = 713 (3% of Total Res)

Following data clean-up and reclassifications, BOE student records were joined to 911 Addressing/Tax Assessor by their full address.

- Total Residential Addresses w/o students=16,679 (79% of Total Res)
- Total Residential Addresses w/ students = 4,528 (21% of Total Res)
 - Total Single Family w/ students = 4,254 (20% of Total Res; 94% of Total Res w/ Kids)
 - Total Multi Family w/ students = 144 (0.7% of Total Res; 3% of Total Res w/ Kids)
 - Total Mobile Home w/ students = 130 (0.6% of Total Res; 3% of Total Res w/ Kids)

It should be noted that 2,509 records, after processing, were still classified as <Null> (not classified as either residential or non-residential in either the 911 Addressing or Tax Assessor data). 303 of these records did match with BOE data, indicating the likelihood that they are Residential, but they were not field verified.

Residential Addresses in Subdivisions

- Total Residential Addresses in Major Subdivision = 12,417 (59% of Total Res)
 - Total Single Family in Major Subdivision = 11,635 (55% of Total Res; 94% of Total Res in MS)
 - Total Multi Family in Major Subdivision = 486 (2% of Total Res; 4% of Total Res in MS)
 - Total Mobile Home in Major Subdivision = 296 (2% of Total Res; 2% of Total Res in MS)
- Total Residential Addresses w/ students in Major Subdivision = 3,122 (15% of Total Res; 70% of Total Res w/ students; 25% Total Res in MS)
 - Total Single Family w/ students in Major Subdivision = 3,018 (14% of Total Res; 67% of Total Res w/ Kids; 24% Total Res in MS; 97% of Total Res w/ students in MS)
 - Total Multi Family w/ students in Major Subdivision = 58 (0.3% of Total Res; 1% of Total Res w/ Kids; 0.5% Total Res in MS; 2% of Total Res w/ students in MS)
 - Total Mobile Home w/ students in Major Subdivision = 46 (2% of Total Res; 1% of Total Res w/ Kids; 0.4% Total Res in MS; 2% of Total Res w/ students in MS)

During initial classification of the 911 Addressing data, the easiest site types were acquired first. These included anything with a secondary address of APT (R2 – Multi Family), LOT (R3 – Mobile Home), or STE (C1 - Commercial) and any single address within a Major Subdivision (R1 – Single Family). This may have introduced bias into the final statistics of addresses. However, it should be noted that 13,309 of the full 25,186 addresses (this includes all types) are located within Major Subdivisions. This means that 53% of all addresses are located within Major Subdivisions.

Residential Addresses Located in the County

- Total Residential Addresses in Jefferson County (not in Municipality) = 15,965 (75% of Total Res)
 - Total Single Family in Jefferson County = 14,555 (69% of Total Res; 91% of Total Res in County)
 - Total Multi Family in Jefferson County = 732 (4% of Total Res; 5% of Total Res in County)
 - Total Mobile Home in Jefferson County = 648 (3% of Total Res; 4% of Total Res in County)
- Total Residential Addresses w/ students in Jefferson County = 3,545 (17% of Total Res; 78% of Total Res w/ students; 22% Total Res in County)
 - Total Single Family w/ students in Jefferson County = 3,345 (16% of Total Res; 74% of Total Res w/ students; 21% Total Res in County)
 - Total Multi Family w/ students in Jefferson County = 74 (0.3% of Total Res; 1.6% of Total Res w/ students; 0.5% Total Res in County)
 - Total Mobile Home w/ students in Jefferson County = 126 (0.6% of Total Res; 2.8% of Total Res w/ students; 0.8% Total Res in County)

Since municipalities usually contain a large percentage of businesses within a county, it was important to determine the statistics for Residential Addresses in the County vs. in the Cities. It should be noted that 18,741 out of the original 25,186 addresses are located in the County. This means that 74% of all addresses are located outside of municipalities.

Residential Addresses with Building Area

After the merger of the address data with the building area, the dataset was given to the contractor for final review and analysis. The statistics for this section can be found in the contractor's final report.

References

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