



Integrated Demographics: Intelligently Planning the Future

## Dynamic Boundary Impact Analysis™ Technical Paper

### Technical Description of How Dynamic Boundary Impact Analysis Works

Dynamic Boundary Impact Analysis is a tool designed to assist planners anticipate the impact of carving out a new attendance area for either opening a new school or reconfiguring the boundaries among existing schools. It draws upon the underlying existing student population enrolled in existing schools by residence address and the projections generated by DecisionInsite at low level geographies. As an analytical tool, it is very powerful, but it is important to understand how it works and what it does and does not do.

#### How Dynamic Boundary Impact Analysis Works

For each of the school boundaries that overlap the custom drawn boundary, the system point plots the school's current year students and calculates what percentage fall within the new boundary. (The point plot is performed one grade at a time within the new boundary's grade range in order to anticipate students by grade level.)

In order to provide an estimate of potential students that might be served by the school inside the proposed boundary, the system subtracts the percentage of the students falling inside the new boundary from each of the affected school's past enrollment, and projects that percentage forward, and thereby generates the total number of students enrolled from the new boundary.

#### Important Points to Understand

1. Relative to students already enrolled in the district, the newly carved out attendance area captures ONLY students who
  - reside within the custom drawn boundary,
  - attend one of the schools through which the new boundary is carved.

The Dynamic Boundary Analysis process does NOT account for students attending an existing school who reside outside its attendance area (incoming intra-district transfers). In other words, the past enrollment and future projections deal only with enrolled students from within one of the

attendance boundaries wholly or partially captured in the proposed attendance boundary.

2. If one tries to compare the standard DecisionInsite projections for a school to the projections generated under the Dynamic Boundary Impact process, the numbers will not match. There are two reasons:
  - First, this approach does not count students served from outside the attendance area of any school affected by the analysis, and
  - Second, this approach does not count students who live within one of the affected attendance areas, but actually enroll in a different school. These students may reside within the boundary and within the carved out area, but they will not be counted either in the proposed school's numbers or in the impact upon any of the existing schools.
  - In a typical situation, the Dynamic Boundary Impact Analysis will generate fewer students than the Enrollment Projections option on the Demographics page because of this factor, i.e., the Enrollment projections see all students residing inside the polygon, while the Dynamic Boundary Analysis sees only those that reside AND are enrolled in one of the schools.
3. The Dynamic Boundary Analysis process assumes that all of the students who fall within the newly carved out attendance area will enroll in the new school. Of course in reality, that may not be the case. For example, the district may choose to permit certain students to continue at their current school. Likewise, if the new school is not closed to open enrollment, some students may enroll from outside the new attendance area.
4. This process is useful in that it provides a good impression of the impact of carving out a boundary in one way versus another as well as providing a rough estimate of a potential new student body for the new school. Generally speaking, most students enroll in the school whose attendance area encompasses their residence. This being the case, the analysis provides useful assistance in forming new attendance areas.
5. Not all variables are in play, nor can they be because of information that is not applied and/or not available to this process. DecisionInsite's standard projection model is sensitive to patterns of enrollment both inside and outside of an established attendance area—frankly, it does not care where an enrolled student lives within or without. But in order to do our standard process there must be some history of draw to a school that can be observed and used to generate a future pattern of draw to a school. Without that history, the Dynamic Boundary Analysis process has no basis for creating a draw rate from either within or outside the hypothetically carved-out attendance area.

6. Relative to students who are projected to reside in a proposed dwelling unit project, a given results table, whether associated with the newly carved attendance area, or an existing attendance area, includes all students projected to reside in a given dwelling unit project, if the footprint of that project is more that 50% inside that particular boundary.

The Dynamic Boundary Impact Analysis is extremely useful because it quickly and easily generates a picture of proportional impact on existing schools, and a projected enrollment for a new school. Though hypothetical, the results are particularly valuable for conceptual planning.

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## **Enrollment Projection Analysis vs. Dynamic Boundary Impact Analysis**

This paper offers a more technical description of the difference in methodologies and therefore results between the Enrollment Projection Analysis (EPA) found on the Demographics page, and the Dynamic Boundary Impact Analysis (DBIA) tools.

At the most basic level, these are two different processes. The EPA is doing an analysis of the underlying StudyBlocks (SBs) where district wide numbers have been projected. The DBIA is doing an analysis of the school's projections by attendance area. The former is looking at all students who reside within the SB, and the latter only the students who live inside the school's attendance area that has been included in the custom polygon.

### **EPA Process**

1. System does a spatial query to determine which SBs are included in the custom polygon.
2. It point plots all students within the SBs to obtain a percentage of all students within the SB. So for example, if there are 100 K-6 students and the polygon captures 40 of them, then that SB percentage for K-6 will be 40%.
3. The system then multiplies the total number of K-6 current and projected students served by the district in that SB by the percentage.
4. All SBs are then aggregated into a single table.

### **DBIA Process**

1. System does a spatial query to determine which SCHOOL attendance areas are included within the polygon.
2. It point plots the students of each school by grade within the polygon to get a percentage by school and grade.
3. It applies that percentage to the SCHOOL projections (see the individual school projections under the Projections menu) to generate a school by grade impact.
4. It then totals the impact to create the first table.

### **Why different? There can be several reasons and all are valid.**

1. First, because the EPA method is looking at all students in a specific SB, you can potentially have students living within the SB that are not attending any of the schools whose boundaries have been intersected by the custom polygon. Those students would be included in the EPA table but they would not be included in the individual school impact numbers and therefore not in the DBIA aggregate tables.
2. Second, because DBIA is looking only at schools and only at students attending those schools within the polygon, if the school draws students from other areas its total could be higher (for example due to open enrollment). Then when the percentage of the students in that attendance area is multiplied by the total by grade, the numbers can be lower.

### **Residential Development**

1. Students generated by proposed residential development are included in both methods. In the EPA process, they are integrated into the totals by grade and school within each SB. In the DBIA process, each dwelling unit project is examined as to its location inside either the newly carved boundary or one of the existing boundaries. If more than 50% of the Dwelling unit polygon is contained inside any one of the boundaries, the students generated are added into the numbers for that boundary.

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