Boston’s Enrollment Landscape
MIT School Effectiveness and Inequality Initiative

Prepared for: Oakland Unified School District Working Group
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Chetan Patel, Research Fellow
Overview and Goals

• Introduce MIT SEII
• Provide overview of BPS and historical context
• Discuss two current enrollment policies and their implementation
  • BPS’s Home-based Assignment Plan
  • Common application for charter schools
• Share lessons and takeaways
• Answer questions from working group
MIT School Effectiveness and Inequality Initiative (SEII)

- MIT SEII is a research lab at based in the Department of Economics
  - Founded by MIT faculty Joshua Angrist, Parag Pathak, and David Autor
- We seek to answer the most pressing education policy questions today
  - Much of our current research focuses on measuring school quality and improving access to high-quality schools
- We frequently partner with school districts, including Boston Public Schools, to evaluate the impact of educational policies
• Over 54,000 students in 125 schools
  • Additional 10,000 students in public charter schools
• “Majority minority” district
  • 42.5% Hispanic
  • 33% Black
  • 14% White
  • 9% Asian
  • 1.5% Other/multiracial
• Nearly half of students are economically disadvantaged
• BPS currently uses the Home-based Assignment Plan and deferred acceptance algorithm to assign students to schools

Source: Boston Public Schools
Looking back

• 1960s-70s: Boston School Committee actively opposed school desegregation
• 1974: Federal District Court judge ruled that the Committee deliberately segregated schools and began the process of desegregation through busing
  • Some 18,000 black and white students were ordered to take buses to schools outside their neighborhood

Source: WBUR

“The Soiling of Old Glory” by Stanley J. Forman
1977 Pulitzer Prize for Spot Photography
After Busing

• 1987: BPS adopted a new, choice-based assignment plan
  • 3-zone (North, West, and East)
• 1999: BPS eliminated racial preferences in assignment and adopted the Boston Mechanism
• 2005: BPS replaced Boston Mechanism with the Deferred Acceptance algorithm
• 2012: BPS began to reevaluate the 3-zone plan
Home-based Assignment Plan
Home-based assignment plan

• In 2012, Mayor Thomas Menino stated that he wanted students to attend schools closer to home to stimulate more parental involvement and neighborhood cohesiveness

“Pick any street in our city. A dozen children probably attend a dozen different schools. Parents might not know each other; children might not play together. They can’t carpool, or study for the same tests. We won’t have the schools our kids deserve until we build school communities that serve them well”

– Boston Mayor Thomas Menino, 2012 State of the City Address

Source: City of Boston Mayor’s Office; New York Times
Home-based assignment plan

• Behind the scenes: a ballooning transportation budget
  • $80.4m per year
  • 9.4% of operating budget
  • 4x national average

• Changing demographics called into question the effectiveness of busing…

Source: City of Boston Mayor's Office; New York Times
Boston Public School Enrollment by Race

The share of white students in Boston's public schools dropped sharply as the schools were forced to desegregate. Mayor Thomas M. Menino wants a new system that would involve less busing.
“Children are being bused now because they have been bused for 40 years and no one has had the political courage to dismantle it,” said Lawrence DiCara, a former Boston city councilor who supported busing in the 1970s. “Now, there are no white kids to be integrated. Everyone is being randomly bused. It doesn’t make sense.”


“The city's demographics have changed. In the 1970s, Boston was largely a "bicultural" city with a "white" majority and a significantly smaller "black" minority. The current student population is ‘majority minority.’”

-Boston Globe, 2009
The Change Process

- BPS publicizes a number of plans
  - Initial plans divided the city into 6, 9, 11, or 23 zones based purely on neighborhood
- Mayoral-appointed External Advisory Committee meets for over a year to discuss
  - 27 members: parents, principals, teachers, students, and community representatives
  - Includes more than 70 community meetings and a survey

Source: New York Times
“A plan that limits choice and that is strictly neighborhood-based gets us to a system that is more segregated than it is now.”
– Kim Janey, Massachusetts Advocates for Children
The Change Process

MIT has plan for Boston school assignments

• Peng Shi proposes the Home-Based Assignment Plan (HBAP) to eliminate zones altogether

• Mayor, superintendent, and committee commission a report from SEII to forecast the effects of HBAP and alternatives
  • While numerous groups evaluated these plans, none of them used any formal algorithm in their analysis
  • Evaluation of alternative plans would require projecting how students would choose schools

Source: Boston Public Schools
The Change Process

- HBAP receives majority support (20/27) from EAC and the superintendent
- 2014: School Committee Votes to Adopt the HBAP

Source: Boston Public Schools
HBAP creates a customized list of schools based on a family’s address. Lists contain the closest:

- 2 top-tier schools
- 4 top- or second-tier schools
- 6 top-, second-, or third-tier schools

- Families rank schools they prefer and students are assigned based on a deferred acceptance algorithm
- Includes sibling priorities
Home-based Assignment Plan

Example of a school choice list with:
- 2 Tier 1 schools
- 3 Tier 2 schools
- 2 Tier 3 schools
- 3 Tier 4 schools
- 3 Citywide schools

*Tiers are based on a combination of proficiency and growth measures

Source: Boston Public Schools
Ongoing Challenges

• Tier definitions
• Changes to the system diminished effects on reform
  • Grandfathering
  • Access to additional schools for ELL students
• District capacity for ongoing monitoring/tweaking
• Unrealized access to quality
  • Some families did not rank all Tier 1 and Tier 2 schools in their list

Source: Boston Area Research Initiative (BARI) 2018 Report
The color scale charts the opportunities students had for ranking Tier 1 and Tier 2 schools but chose not to. 1.0 signifies a 100% access to quality had the student picked all Tier 1 or Tier 2 schools.
A Unique Solution for a Unique Problem

Pros:
- “Providing choice closer to home”
  - Students travel shorter distances and times to get to school
    - Kindergarteners attended schools ¼ mile closer to home, on average
  - Managing costs

Cons:
- Some evidence that it diminished integration across the city
  - Asian and White students became increasingly concentrated at a small number of schools that were more likely to be of high quality
    - Difficult to know whether this was caused by the mechanism or other trends
  - Quality schools are unevenly distributed across the city
  - Complexity

Source: Boston Area Research Initiative (BARI) 2018 Report
Publicity push for new Boston schools plan

Lots to explain on assignment system

By James Vaznis Globe Staff, November 4, 2013, 12:00 a.m.

“It’s not the easiest system to understand. My sense is there are still so many families who don’t realize this change is coming.”

- Kim Janey, Massachusetts Advocates for Children
“I got algo-rhythm, who could ask for anything more?”

You know the word on the street. You’ve heard it as much as the Parent Imperfect has, and you’ve probably said it yourself. The Boston School Committee lacks vertebrae. As a committee appointed by the Mayor, it is a rubber stamp that almost never takes a position in opposition to its Appointer, and it absolutely never does that on an important issue. Even a quick look at the Committee’s decisions over the past few years confirms the news. Wouldn’t this be a great time to prove the word on the street wrong?

Comic relief was provided by two professors (one from BC, another from MIT) who spent an entire half hour explaining an arcane aspect of the way the famous “algorithm” works. All they needed to do was get up and dance across the stage singing, “I got algo-rhythm, who could ask for anything more?” Their point was a serious one, but did they deserve six times the space given to Quest or MAC to speak on behalf of an important segment of the district’s parents? Frankly, I smelled a rat, as did one other Quest parent, who rose to speak about the professors later. At the end of the professors’ dissertation defense, School Committee member John Barros dismissed the importance of their point in about forty-five seconds. If this idea of playing with the “processing order” surfaces again, I’ll need no more evidence that City Hall is marionetting this thing.
“We can only contribute one piece of this, and we don’t claim we have solved anything. If you reduce this to a math problem, you think you can solve it. But real life is much more complicated.”

Common Application
Decentralized

• Uncoordinated application and offer system

Con:
• Significant application costs
<table>
<thead>
<tr>
<th>Decentralized</th>
<th>Common Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncoordinated application and offer system</td>
<td>Coordinated application process with shared timeline</td>
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<tr>
<td></td>
<td>Uncoordinated offer process</td>
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</table>

**Con:**
- Significant application costs
- Some students may receive multiple offers, while others receive none
- May increase “congestion”

**Pro:**
- Reduces application barriers
<table>
<thead>
<tr>
<th>Decentralized</th>
<th>Common Application</th>
<th>Partially Unified</th>
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</thead>
</table>
| • Uncoordinated application and offer system | • Coordinated application process with shared timeline  
• Uncoordinated offer process | • Coordinated application process  
• Students receive single best offer  
• Not all schools and sectors included |

**Con:**
- Significant application costs
- Some students may receive multiple offers, while others receive none  
- May increase “congestion”

**Pro:**
- Reduces application barriers

**Pros:**
- Reduces application barriers  
- Ensures all students are matched to a single school
<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Pros</th>
<th>Cons</th>
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<tr>
<td>Decentralized</td>
<td>• Uncoordinated application and offer system</td>
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<td>• Significant application costs</td>
<td>Boston, NYC, Denver, DC, Indianapolis, Newark</td>
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<tr>
<td>Common Application</td>
<td>• Coordinated application process with shared timeline • Uncoordinated offer process</td>
<td>• Reduces application barriers</td>
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<td>Boston, NYC, Denver, DC, Indianapolis, Newark</td>
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<tr>
<td>Unified Enrollment</td>
<td>• Coordinated application process • Students receive single best offer • All schools and sectors represented.</td>
<td>• Similar to partially unified • More information for schools and district</td>
<td>• Often more politically difficult to implement</td>
<td>Boston, NYC, Denver, DC, Indianapolis, Newark</td>
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</table>
Boston Introduces a Common Application

- Boston’s enrollment system is not unified, so there is a separate common application for charter schools
- Boston previously attempted to unify its system
  - Backed by Mayor Marty Walsh
  - Boston Compact was tasked with designing plans
- District charter divide peaks with 2016 ballot initiative
- Efforts to unify are abandoned and charter schools adopt a common application for the 2017-2018 school year
  - Boston Charter Alliance

Source: Education Week
Applications Up, but Similar to Prior Years

Table 2. Total Applications to Each School by Year

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Total 2012-2017

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Some disappointing results

Demand Characteristics

- Prop. of BPS Applying to a Charter
- Prop. of Applicants Applying to Multiple Charters
Key Takeaways

• Boston’s enrollment policies have tried to address local challenges
  • Some specific to Boston, some shared with other cities
• The impetus for change, along with the efficacy of implementation, has depended on numerous stakeholders
  • Boston School Committee
  • Federal judges
  • Mayors and superintendents
  • Residents
  • Activists
  • Researchers
  • BPS
  • Department of Education
  • Charter Schools
• Some reforms more successful than others, but the issue of segregation is ongoing and larger than the technicalities of the system
References


The Boston Mechanism, also known as “first preference first,” is an algorithm that sorts students into schools based on student and school rankings. Assigns as many students as possible to their first choice school.

- Used to assign over 75,000 BPS students between 1999-2005
The Boston Mechanism

• How it works:
  1. Start by considering only applicants’ first choices.
     • Schools assign seats one at a time to these students.
  2. Then consider second choices of remaining students, etc.

• The problem: creates incentives to be insincere and game the system
The Boston Mechanism

• Some families developed sophisticated ranking strategies, raising concerns about equity

• West Zone Parents Group (180 members) recommended two strategies:
  • “One school choice strategy is to find a school you like that is undersubscribed and put it as a top choice, OR, find a school that you like that is popular and put it as a first choice and find a school that is less popular for a “safe” second choice.” – 2008 American Economic Review Paper
Out with the Old...

• 2003: Researchers publish “School Choice: A Mechanism Design Approach.” Boston Globe publishes article highlights the challenges mentioned in the paper

• Superintendent solicits help to change algorithm

• 2005: Boston School Committee votes to replace Boston mechanism with the deferred acceptance algorithm

Source: Boston Globe
Definition: Deferred Acceptance

Deferred Acceptance (DA) is an algorithm that combines student preferences and school priorities to produce a single best offer for each applicant.

It loops through a series of tentative matches between schools and students; no decision is final, and each acceptance is deferred until the entire process ends.
Deferred Acceptance

DA has been adopted in many districts because it is...

1. Strategy-proof
   • It’s always in applicants’ best interests to rank schools truthfully
   • Applicants gain nothing from misrepresenting their true preferences (e.g., ranking a less-preferred school first) or ranking fewer schools

2. Fair
   • Each applicant has a fair chance of being considered by a school on her list, regardless of how high she ranked the school compared with other applicants
   • Levels the playing field—families with more time and knowledge can’t game the system through “strategic ranking”
   • Minimizes “justified envy”
Deferred Acceptance

3. Informative
   • Generates informative enrollment data that can be used to study demand patterns and even the causal impact of schools on student outcomes
     • Example: Current work in NYC to forecast outcomes in admissions criteria

4. Makes it easier for districts to advise families.
   • “List your school choices in your true order of preference. There is no need to “strategize.” If you list a popular school first, you won’t hurt your chances of getting your second choice if you don’t get your first choice.”
     – 2008 BPS brochure