

Econ 330: Urban Economics

Lecture 7

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Lecture 7: Neighborhood Choice

Schedule

Today

1. **Office Space & City Structure**
2. **Introduction to Amenities**
3. **Sorting for Public Goods**
4. **Neighborhood Sorting Intro**

Upcoming

- **HWII due in class Feb 6th**
- **Reading** (Chapter IV & V *ToTC*)
- **Midterm** week 6 -- on the horizon

Office Space

Last bid - rent curve we will work on: that for **offices**

- We will take a break from math, I just want to get the intuition down

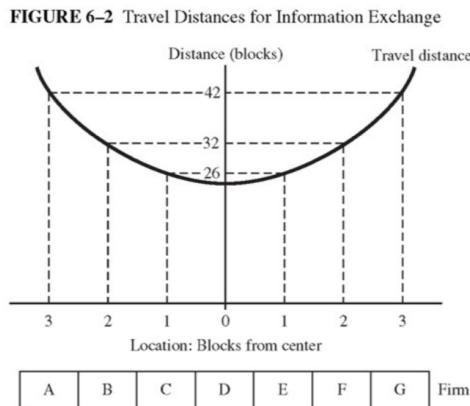
Assumptions

- Office firms use high skilled labor that need face to face interaction for production
- Proximity to other office firms is an important input
- Opportunity cost of high skilled labor time is greater than other types of labor

Office Space

Example: Assume you have a bunch of identical firms

- They are located on a line. WTP for space depends on proximity to other firms



- Travel dist in minimized at median location, block c
- Moving from med location puts firm closer to fewer others and further from more firms
- Firm D only has 15 total blocks of travel

Office Bid Rent

- So as office firms get further from center their "transit" cost goes up. So what must happen to WTP?

City Organization

So how do we put all of this together? And why are these called **bid** rent curves anyways?

- **Land will be allocated to highest bidder**
- This will vary by location in the city

Example

- Assume profit for office and manufacturing is given by
- $\pi_{\text{office}} = 105 - r(x_{\text{Office}}) - (5 + 4 * x_{\text{office}})$
- $\pi_{\text{manufact}} = 75 - r(x_{\text{manufact}}) - (5 + 2 * x_{\text{manufact}})$

For consumers, they can allocate money between housing and commuting:

- $P = \frac{100}{4} - \frac{2}{4} \cdot x$

Example

Task:

- Derive the bid rent curve for office space, manufacturing, and commuters. Plot all of them.
- Find how land is allocated. Specifically, over what range from the center is office space, manufacturing space, and housing space?

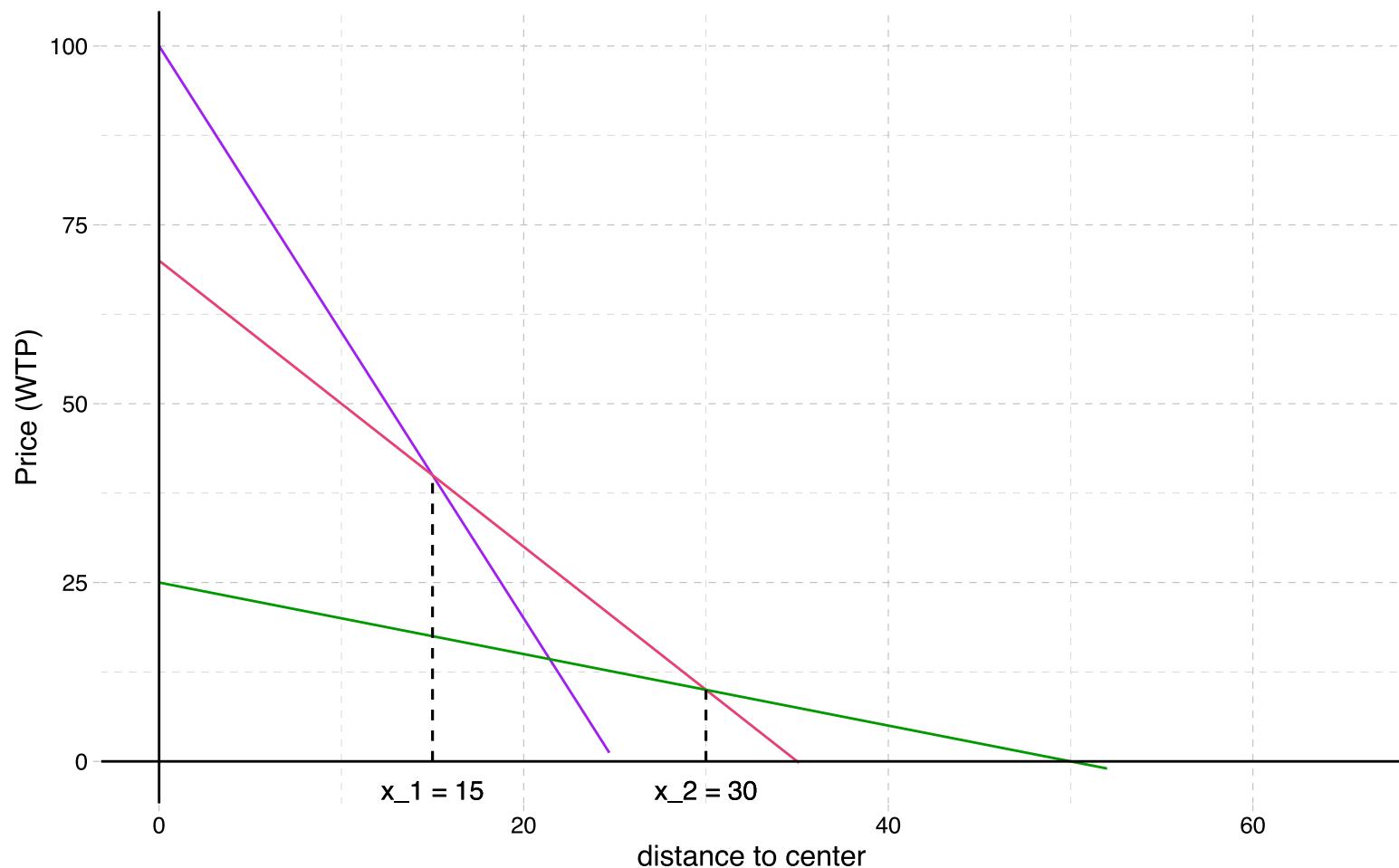
Example

Task:

Bid rent curves for office and manufacturing come from zero profit.
Commuters curve was given.

- Office: $r(x_{\text{office}}) = 105 - (5 + 4 * x_{\text{office}})$
- Manufact: $r(x_{\text{manufact}}) = 75 - (5 + 2 * x_{\text{manufact}})$
- Commuters: (given) $P = \frac{100}{4} - \frac{2}{4} \cdot x$
- Office firms locate in the range of x in $[0, 15]$
- Manufacturing firms locate in the range of x in $[15, 30]$
- Commuters locate in the range of x in $[30, 50]$

Example



Checklist

0) **Office Space & City Structure**



- Median Location
- Office Bid Rent
- City Organization

3) **Neighborhood Sorting Model:**

1) **Introduction to Amenities**

2) **Sorting for Public Goods**

So Far

We have a fairly simple model™ of residential choice (rental prices). What factor(s) in the model influences housing demand?

- Bid-Rent curve for housing only includes commuting costs.

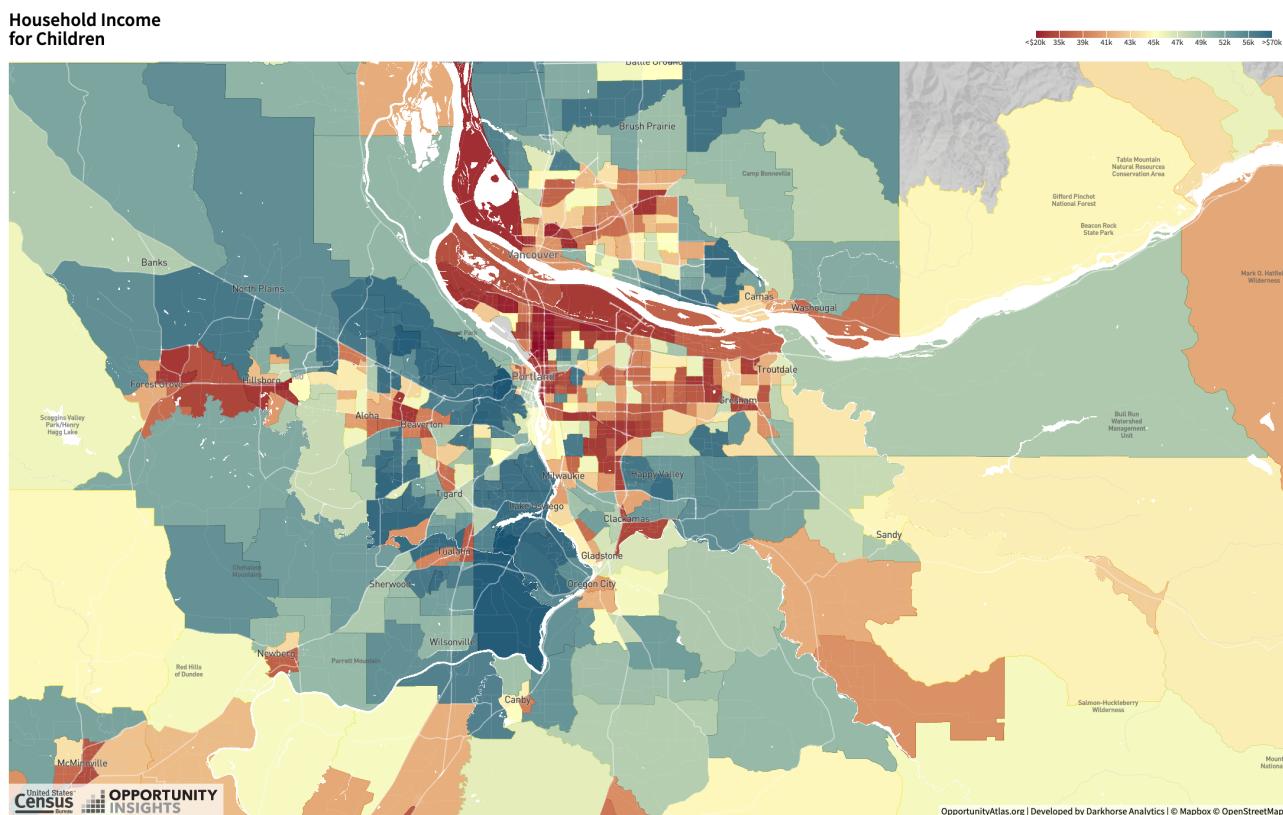
Question: Is this all you consider when deciding where to live?

- What factors influence neighborhood decision choices? **Discuss**

A few examples

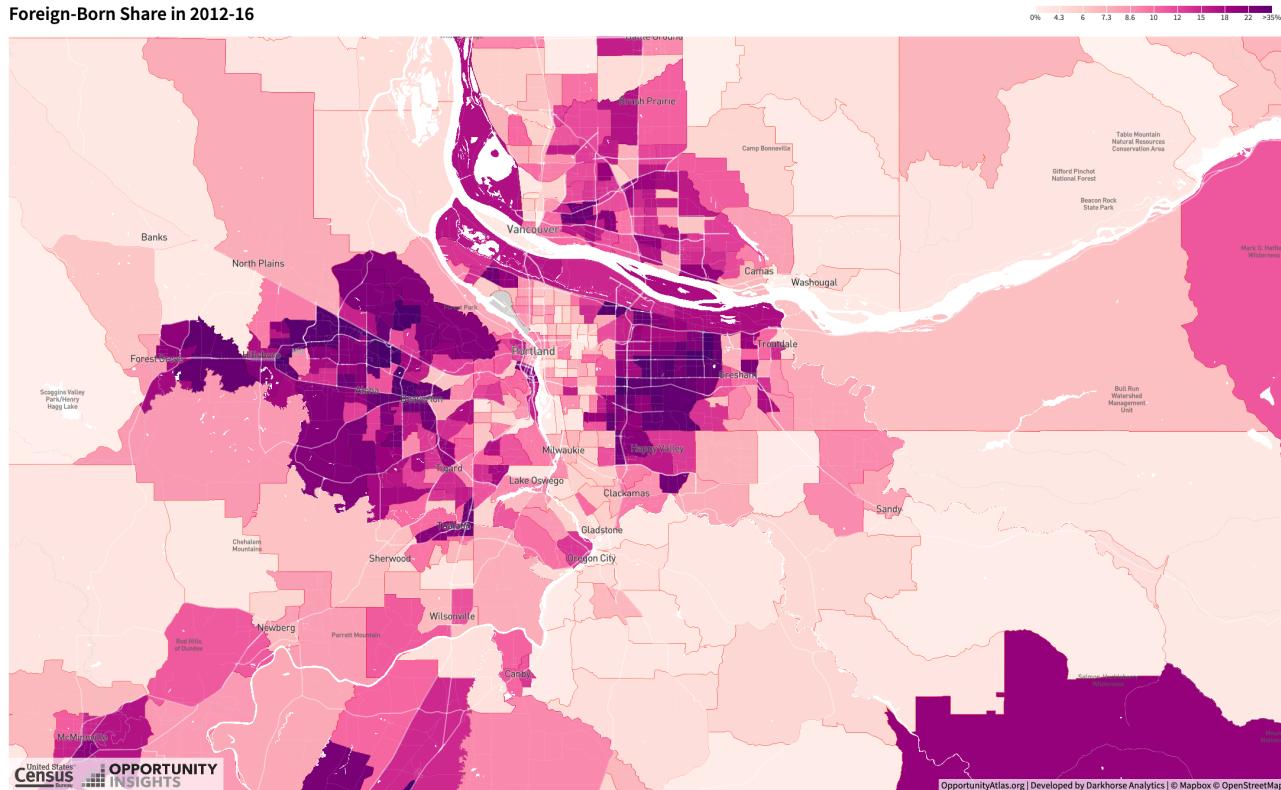
- Schools
- Demographics
- Crime Rate
- Air Quality

Map 1



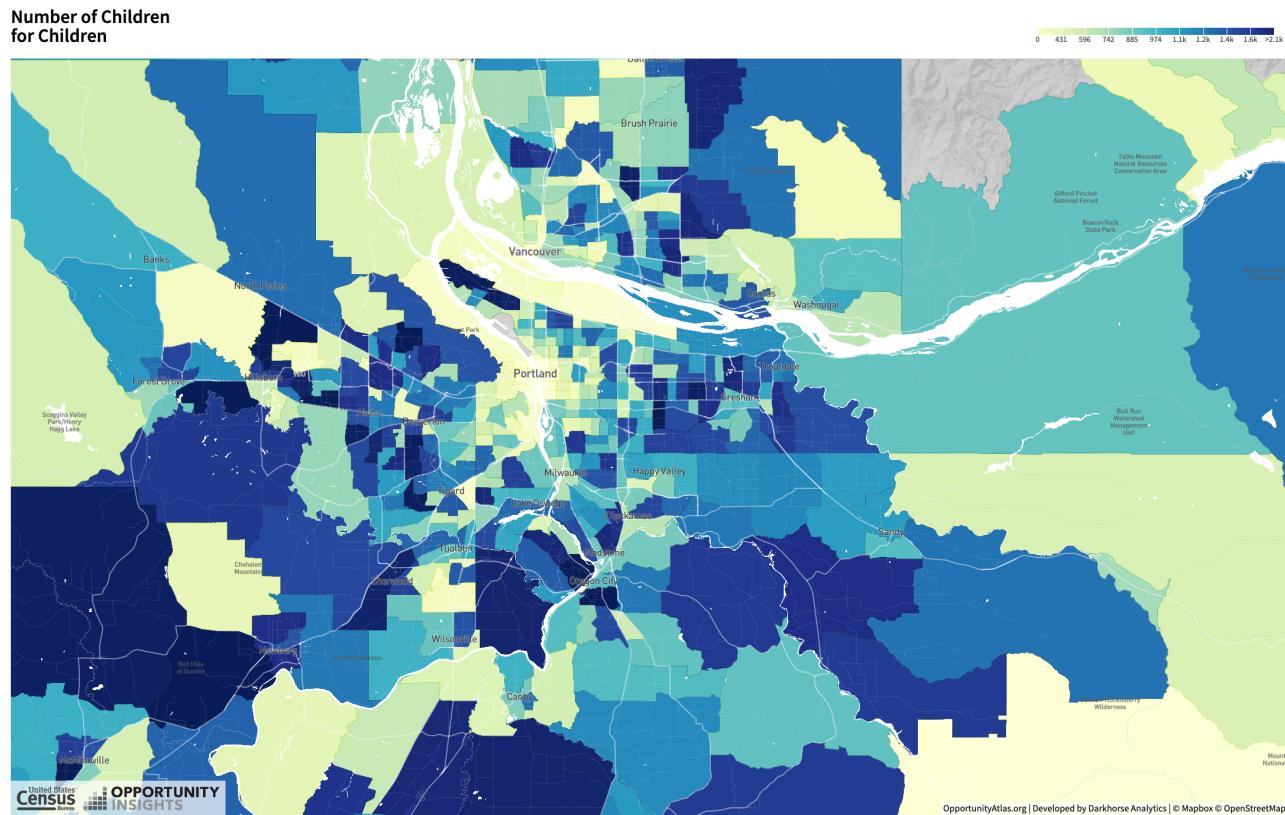
Source: Opportunity Atlas

Map 2



Source: Opportunity Atlas

Map 3



Source: Opportunity Atlas

Amenities

Defn An amenity is a **location-specific** consumption good

- These can vary across cities, within cities
- Some shared by individuals, can be different for low and high income

More examples

- Beaches
- Parks
- Restaurants

Amenities

Let's refine our language a bit. Two definitions:

1) **Exogenous Amenities** are **location-specific** consumption good that exist **are not** influenced by where people decide to live

- Exogenous means "determined outside of the model." Think about exogenous variables as given.

2) **Endogenous Amenities** are **location-specific** consumption goods that **are** influenced by location decisions of individuals

- Endogenous means "determined within the model." The model here is that of individual location choices

Examples

Exogenous Amenities

- Weather
- Proximity to Beaches and *federally* protected natural areas (why not local?)
- Proximity to Mountains

Endogenous Amenities

- School Quality and Quantity
- Crime
- Air Quality (probably both)
- Parks

Checklist

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3) **Neighborhood Sorting Intro:**

1) **Introduction to Amenities** 

- Exogenous Amenities
- Endogenous Amenities

2) **Sorting for Public Goods**

Amenities as Public Goods

Some amenities, like city parks, are *local public goods*. Does everyone care about these parks equally?

Probably not

Example:

- Consider a 3 citizen city each with differing demands (Max WTP) for parks
 - Saurabh has low demand, Sam has medium demand, Jenny has high demand
- Park Costs **\$60 per acre** to build
 - One way to fund: **share the burden** equally via a *per capita tax* (each person pays 20 bucks p acre)

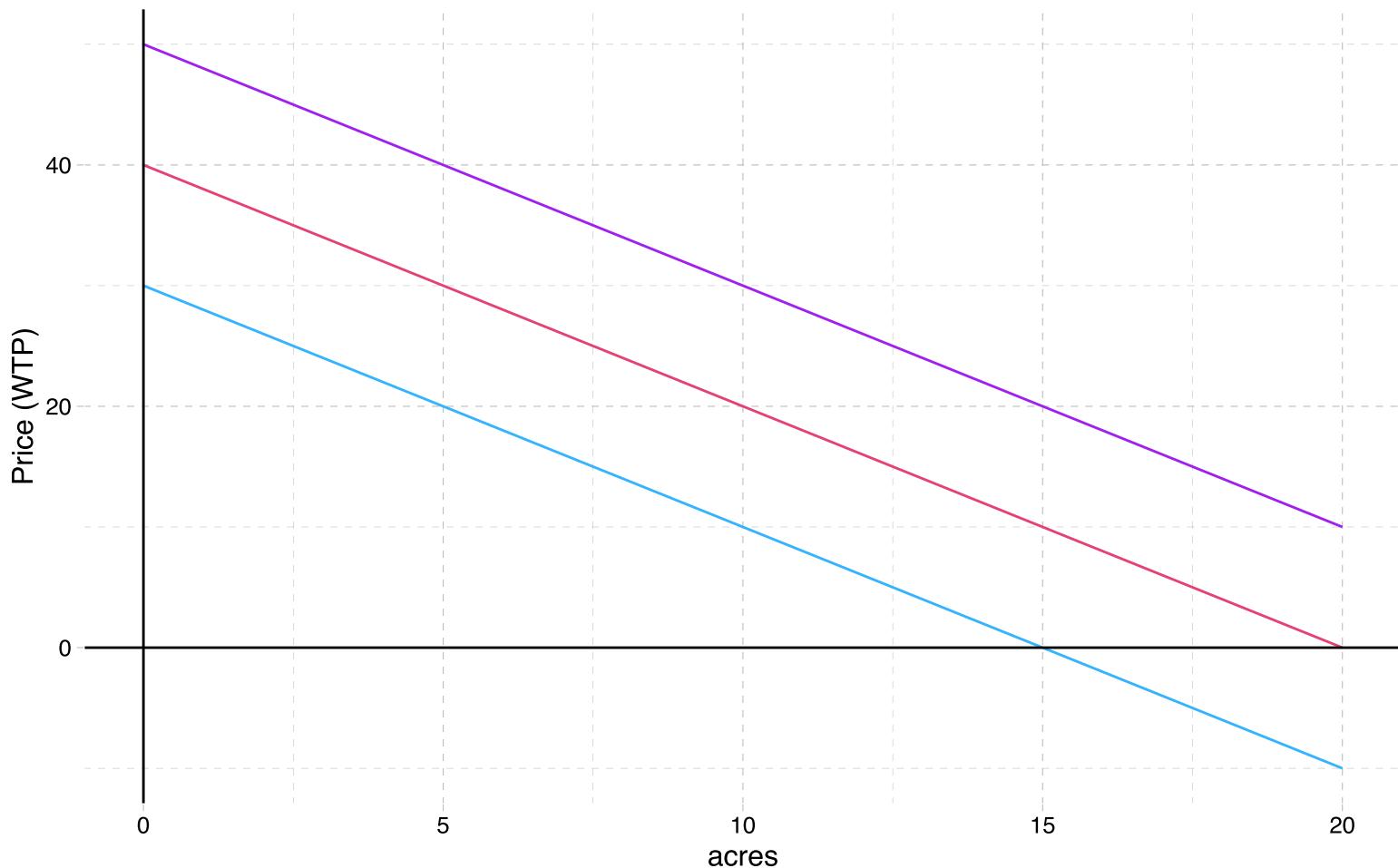
Some Math

Let's be a bit more specific. Suppose the demand curves for each person are given by:

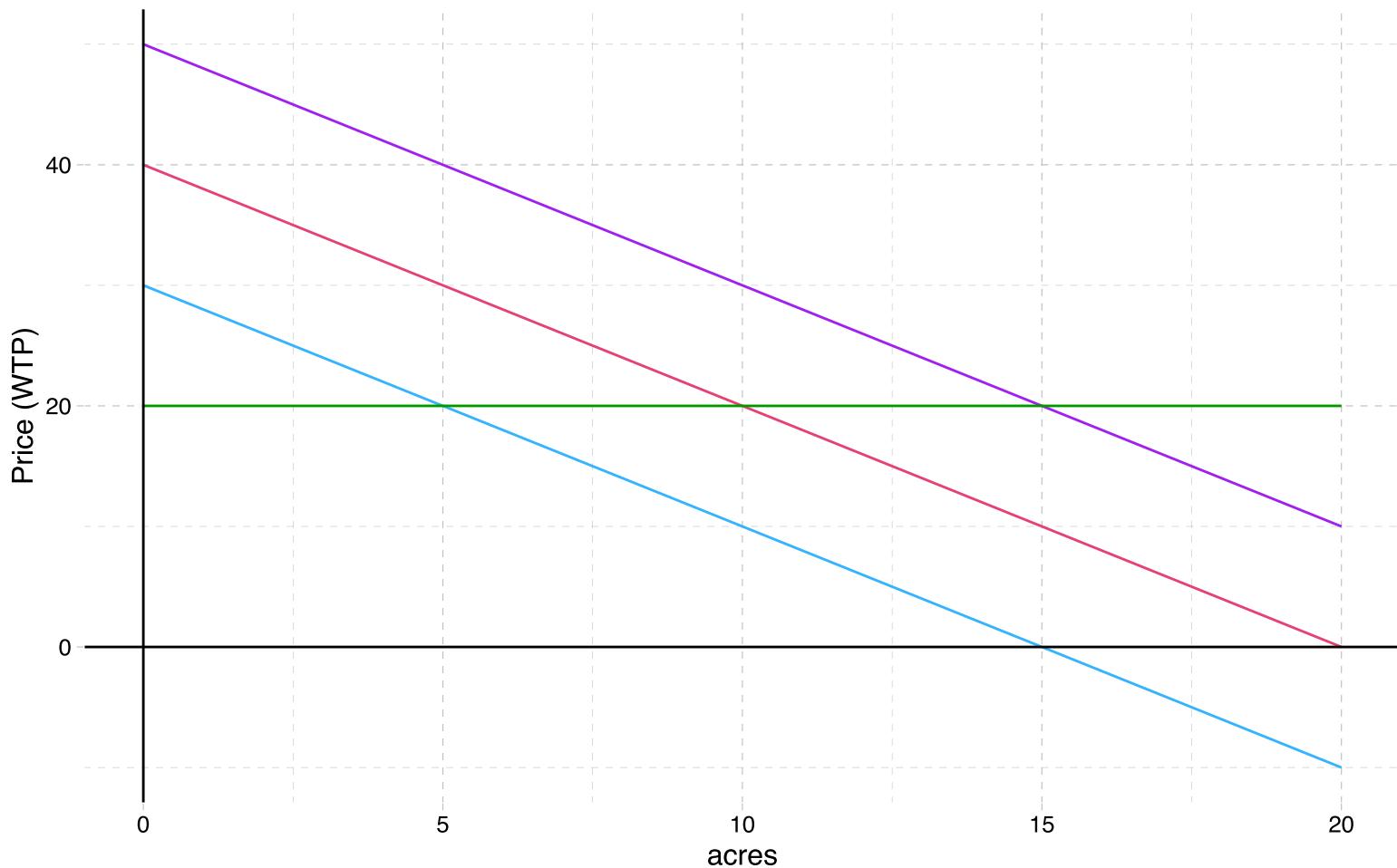
- Saurabh : $P = 50 - 2 * \text{acres}$
- Sam : $P = 40 - 2 * \text{acres}$
- Jenny : $P = 30 - 2 * \text{acres}$

Q: Derive the number of acres of parks for each individuals with a **20** dollar per person per acre tax

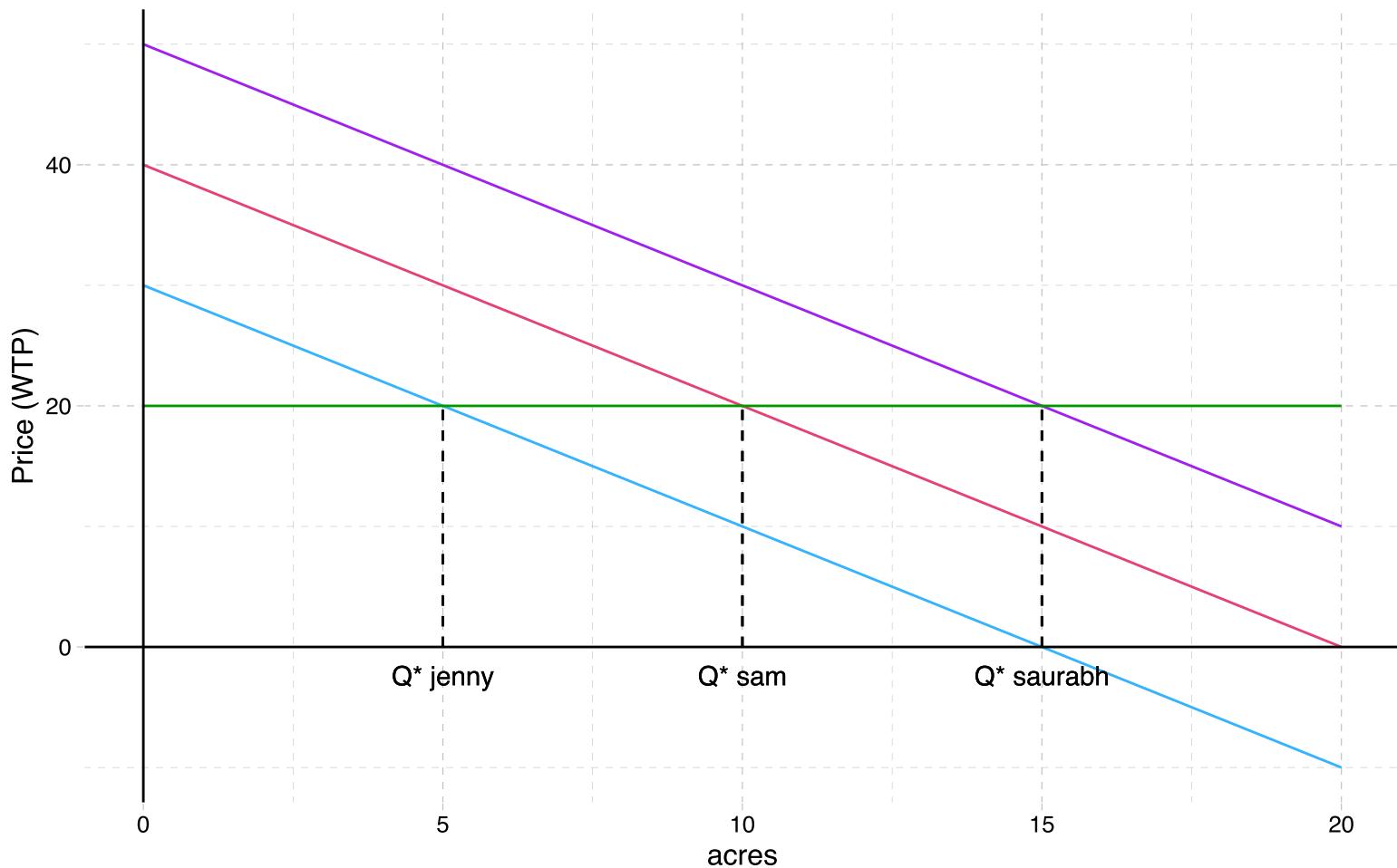
Amenities as Public Goods



Amenities as Public Goods



Amenities as Public Goods



Flat Tax

Tough decisions to make when deciding how much to build

- Any thoughts on how to allocate the resource?
 - How much do we charge people?
 - How much do we build?

Discuss

Majority Rule and Median Voter

One way to make the collective choice of how many acres of parks to build:
majority rule

- Have a series of **binary elections** (multiple votes, each vote there is only one option)
- This election will always result in the winning option being the median voter (Sam)

What is the issue with this theory/model of park dev?

- We see variation in size of parks built **IRL**
- How do we rectify this?

A twist

Now suppose there is a city with **3 identical districts**, each with 3 citizens (Saurabh, Sam, Jenny)'s

- Each district votes on their own park
- Each citizen knows the preferences for parks of other citizens

Key Assumption: **Citizens pick which district to live.** What is the implication?

- Similar types sort into the same neighborhood
- Ie, Saurabh and other low demand types recognize that if they move into the same district they have the highest chance of getting the level of parks they desire

A twist

So, we have 3 neighborhoods with *homogenous types*. What does this do?

Accommodate Diversity in Demand

- In this perfect world, everybody gets what they want. Is reality this simple?

Nope

Reality

Real Cities

- Usually tax property - not a flat per capita tax
- Variation in property value also causes municipal formation (ie, **people sort on income, not just preference for public goods**)

Real People

- Care about a diverse set of things (not just parks). These usually don't overlap perfectly
- Also: people do not know **full set of preferences** of others
- **Reality:** Not everyone gets what they want! 😞

Checklist

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3) **Neighborhood Choice Intro:**

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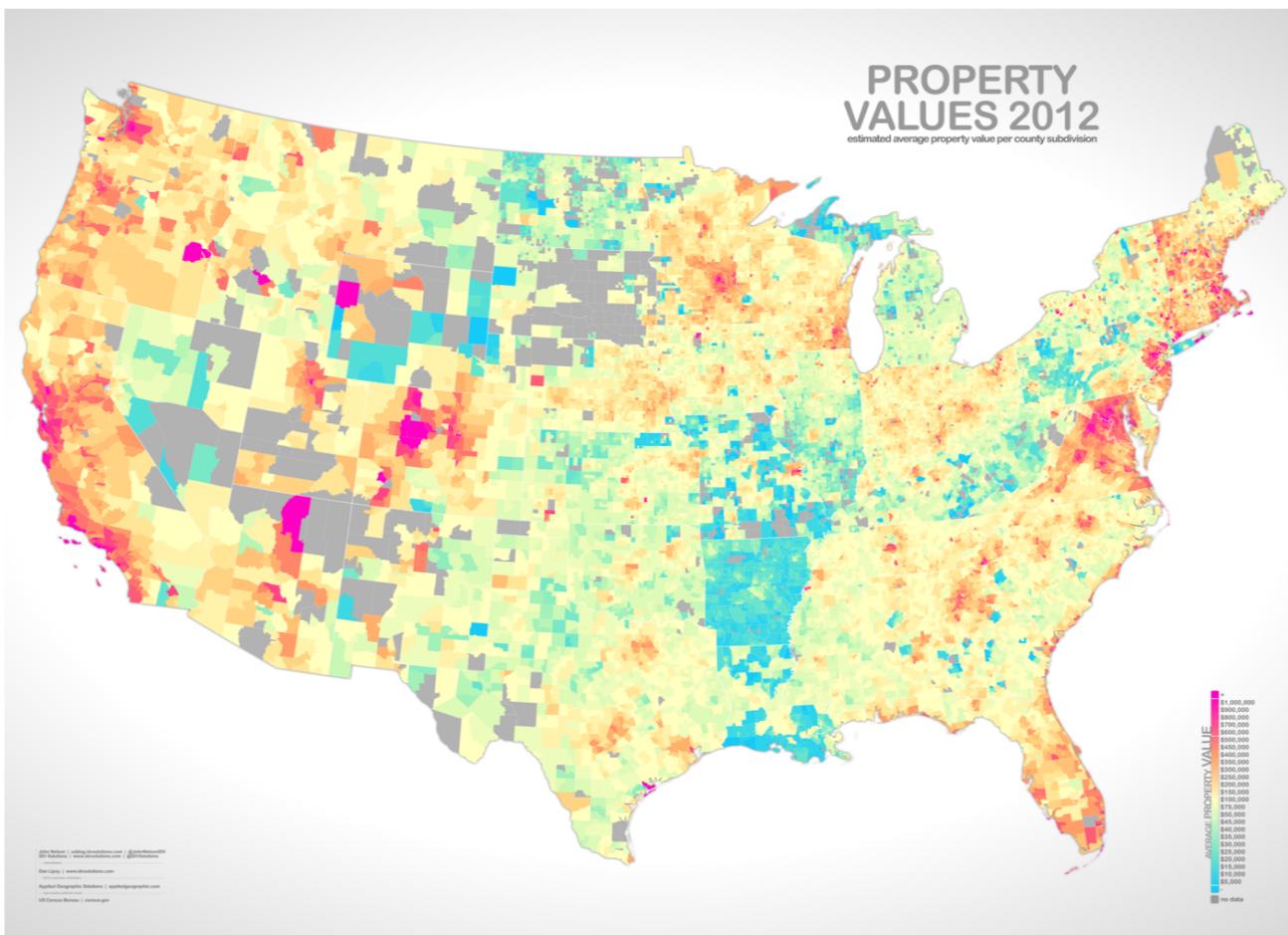
1) **Introduction to Amenities** ✓

- Exogenous Amenities
- Endogenous Amenities

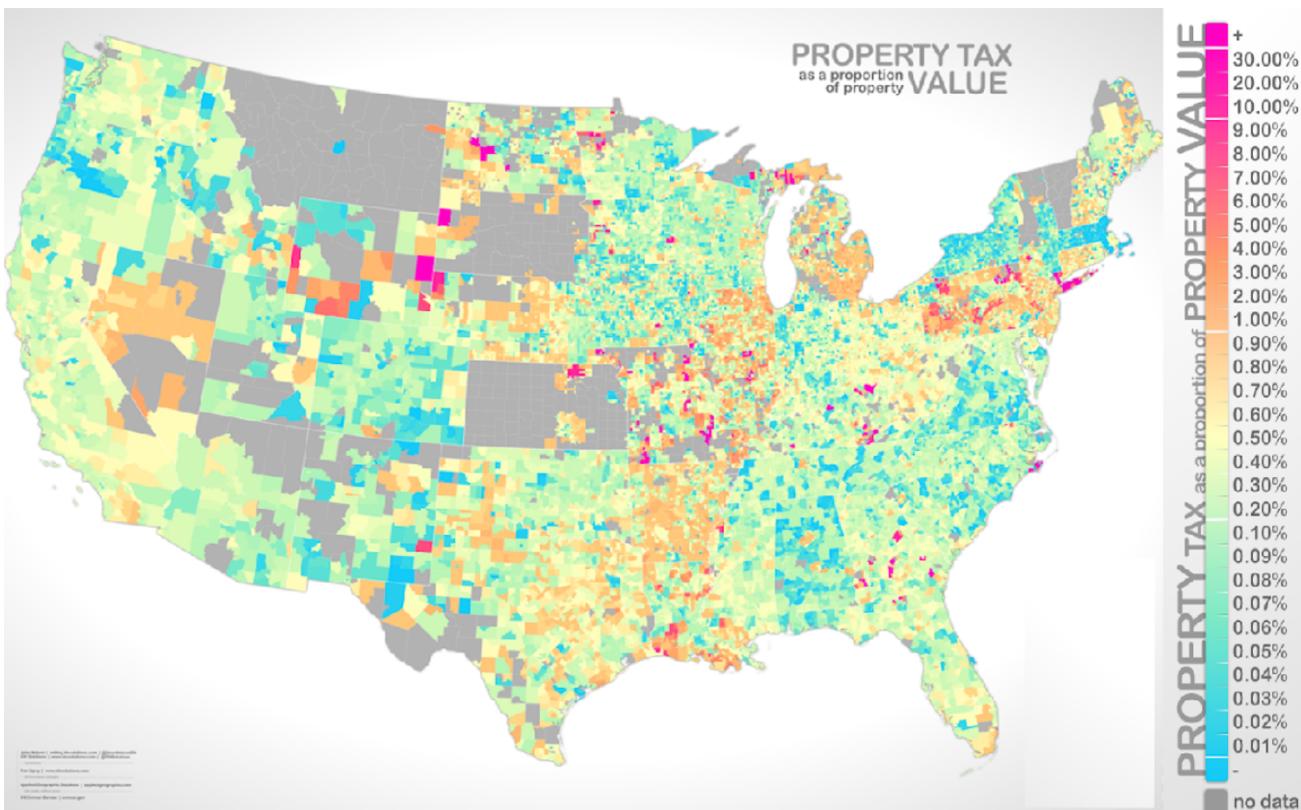
2) **Sorting for Public Goods**

- Demand for public goods

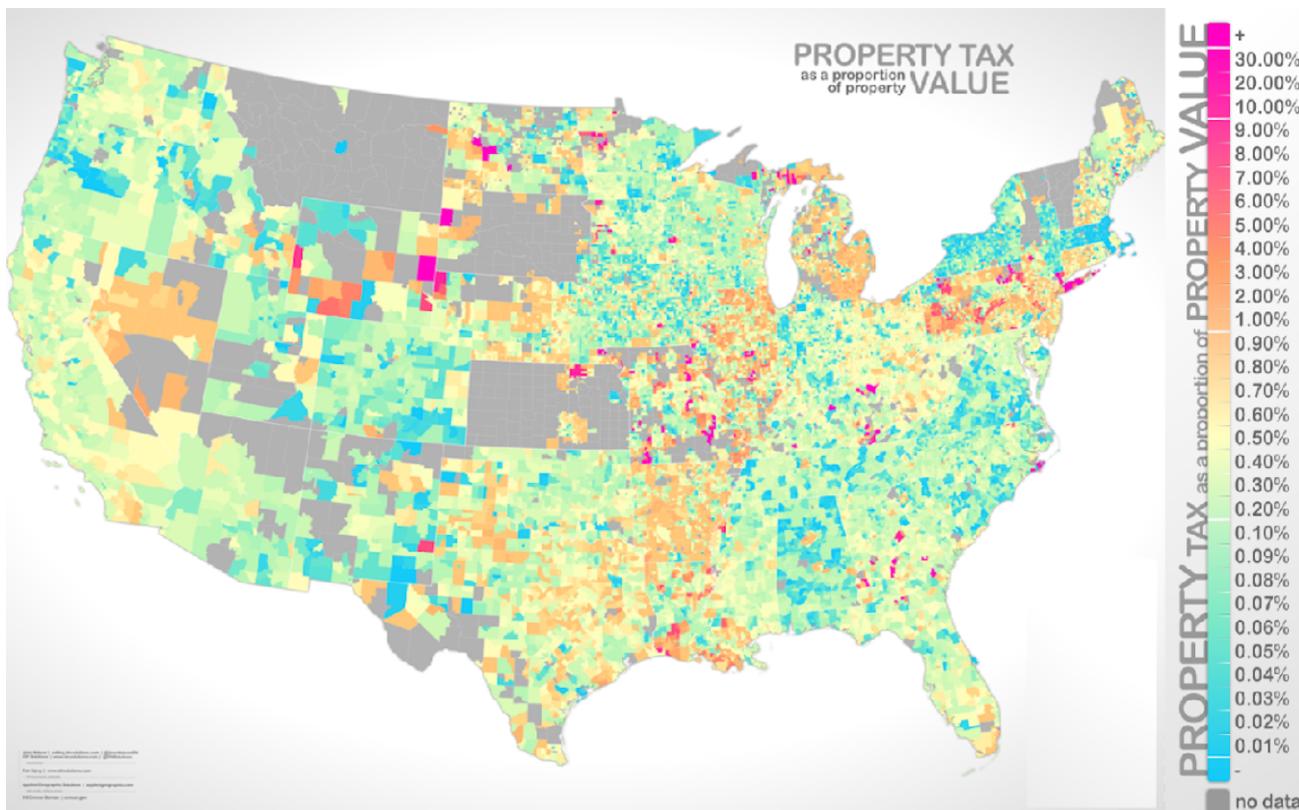
Value and Tax Variation



Value and Tax Variation



Value and Tax Variation



Neighborhood Sorting

I will motivate this with a **question**:

- Do you *fully* internalize the costs and benefits of where you decide to live?
- Put differently: Is your choice of neighborhood free from externalities?

Short Answer: Nope. These externalities are different for adults and children

Neighborhood Sorting

Externalities for kids:

- Good/bad role models as adults
- Classmates in school: focused vs disruptive

Externalities for adults:

- Positive: job information, property valuation
- Negative: property values

In general: positive externalities increase with income and education level.

Why?

Neighborhood Sorting

These externalities give rise to the following questions:

1. Who gets desirable neighbors?
2. Will there be segregated or integrated neighborhoods?
3. Will there be sorting or mixing with respect to income, age, race, or some combination of those factors?
4. What are the implications for the price of land in various neighborhoods?

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