



Distance and scale

from the Esri GeoInquiries™ collection for Human Geography

Audience – Human geography

Time required – 15 minutes

Activity Explore how not all distances are equally distant.

APHG Benchmarks APHG:I.B. Explain major geographical concepts underlying the geographical perspective (scale, location, and place)
APHG.I.C. Analyze changing interconnections among places.

Learning Outcomes • Students will be able to visualize and analyze variations in the time-space compression.

Map URL: <http://esriurl.com/humanGeoInquiry1>

Ask

Are all miles “equally” distant?

- Click the URL above to launch the map.
- ? Why might distances of the same length feel longer or shorter? *[Distance can feel larger or smaller because of cultural similarity, transportation connectivity, telecommunications, and so on.]*

Acquire

How far can you get?

- With the Details button underlined, click the button, Show Contents of Map (Content).
- Check the box to the left of the layer name, Drive Time From Boston (60, 90, 120 Minutes).
- ? Which major city in New Hampshire can you reach in less than an hour? *[Manchester]*
- ? How long would it take to get to Providence, R.I.? *[about 75 minutes]*

Explore

Are we taking the long way around?

- Both Manchester and Worcester are at the outer edge of the 60-minute drive time zone. But, as the crow flies, it is 38 miles to Worcester and 48 miles to Manchester.
- ? Why might driving a longer distance take the same time? *[access to interstate highways]*
- ? What city located less than 50 miles from Boston (as the crow flies) but cannot be accessed in a 120-minute drive (hint: water contributes to the time)? *[Provincetown]*
- ? Why is the travel time so long? *[because you must drive around Cape Cod Bay]*
- ? What other forms of transportation might change the travel time and accessibility? *[water or air travel]*



Analyze

How is population density related to travel time?

- Click the button, Bookmarks. Select BOS-MHT/WOR .
- Turn on the layer, Population Density - Census Tracts.
- Compare the Population Density and Drive Time layers by turning them on and off.
- ? What is the relationship between the drive time and population density? *[shorter drive-time areas have higher population density]*

Act

How do highways affect travel time?

- Turn off the layers, Drive Time from Boston (xx xx xx Minutes).
- Change the transparency of the Population Density- Census Tracts layer to 50% (see ToolTip below).
- Click the button, Bookmarks. Select Traffic.
- ? How are major roads and population distribution related? *[density is higher along the major highways]*
- ? Would travel be faster through a more density populated or less densely populated area? *[Travel is faster through more densely populated regions than less densely populated areas because of the high-volume transportation networks that are most commonly found there. Access to major roads, even if they are congested, enables faster commutes.]*

MEASURE

- Click the Measure tool.
- Select Distance, and then choose the unit of measurement.
- Click once to start measuring, click once to change direction, and double-click to stop measuring.

TRANSPARENCY

- From the Details pane, click the Content button.
- Click the three small blue dots and hover your pointer over the word "Transparency" to open a drop-down list.
- You can modify transparency to see an active layer below the top layer. Set it to 50%.

Next Steps

DID YOU KNOW? ArcGIS Online is a mapping platform freely available to public, private, and home schools. A school subscription provides additional security, privacy, and content features. Learn more about ArcGIS Online and how to get a school subscription at <http://www.esri.com/schools>.

THEN TRY THIS...

- Create hot spots around local transportation hubs and corridors to visualize something closer to home.
- Use analysis tools such as Find Nearest to calculate straight-line distance between cities or buffers to visualize distance from the Boston City Center.

TEXT REFERENCES

This GIS map has been cross-referenced to material in sections of chapters from these texts.

- *Human Geography: A Short Introduction* by Oxford University Press – Chapter 1
- *The Cultural Landscape* by Pearson – Chapter 1
- *Human Geography: People Place and Culture* by Wiley Press – Chapter 1
- <http://apcentral.collegeboard.com/apc/public/repository/ap-sf-human-geo-scale.pdf>