Agglomeration Economies

ECON 492E, TEAM 3

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Purpose

Develop a methodology and calculate the wider economic benefits of connecting UBC to the region with rapid transit


SILICON VALLEY
San Francisco
Oakland
Concord
Foster City
Hayward
San Mateo
Fremont
Palo Alto
Milpitas
Santa Clara
Sunnyvale
San Jose
Cupertino
Scotts Valley
Campbell
Los Gatos
Morgan Hill
KWE
adax
opensys
CENTRAL COMPUTERS
FusionStorm
RIVERBED
HITACHI
princeton
ProActive
Silicon Maps
MIPOX
DSA
KSI
Sun
BIT MICRO
WINTEC
DETECON
VISTO
OPENWAVE
GLOBAL
C3-ilex
PGP
postini
NewSoft
OPLINK
opnext
Gold Technologies Inc.
MIPS
YAHOO!
NetApp
Studley
FOX
SanDisk
PIXIM
ARM
agere systems
tok
SOLECTRON
TIBCO
GUZIK
HALO
Juniper
ReadyServe
RAE
ANALOG DEVICES
phoenix
LINEAR
hp
Microsoft
NetD
TRIANZ
Cisco Systems
intel
iPark
pillar
Chartered
TOYOTA
bmc software
DITECH
Covansys
TRAZAR
AVNET
CAVIUM NETWORKS
FOUNDRY
ChipMOS
Ultratech
everypath
JULY
I-O DATA
legato
YAMAICHI
veraz
UTEC
VaST
ITOCHU
FOUNDRY
TEXAS INSTRUMENTS
SAMSUNG
MITSUBISHI ELECTRIC
HUMANE SOCIETY
NORTHROP GRUMMAN
SPREADTRUM
HARBOR
TOSHIBA
HNL
TRDA
SUPERMICRO
YAMATAKE
FUJITSU
SIEMENS
Signetics
amdocs
SMIC
SANYO
PHILIPS
National Semiconductor
KASHIYAMA
HITACHI
Infineon
BELL MICROPRODUCTS
UMC
DNP
CDS
ZORAN
SHIMADZU
TECDIA
San Jose State University
Leaf Moon Arts
Bay Area Internet Solutions
Wolfe Engineering
Santa Clara University
GESS
CENTRAL COMPUTERS
YOSEMITE TECHNOLOGIES
KODAMA.COM
ROAMWARE
PLANTRONICS
TRANSERA
Borland
DEVICE net
MIKASA SHOJI CO.,LTD.
sanz
HITACHI
Inspire the Next
MITSUI COMTEC CORP.
IPextreme
XILINX
RICOH
HRS
IBM
sv probe
ONStor
TRESTRIA
FusionStorm
WESTERN COMPONENTS

Benefits from Localization (Graham et al.)

1

Pooling labor resources

2

Knowledge sharing and transfers

3

Sharing of intermediate inputs


CONRAD

Benefits from Urbanization (Graham et al.)

1

Increase in the size of labor markets

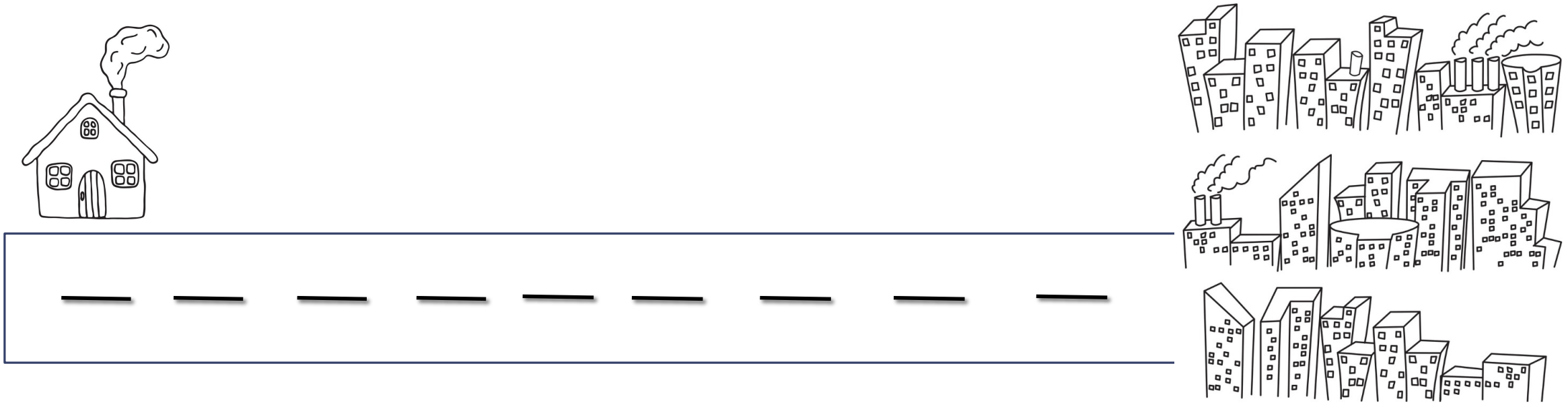
2

Access to more public services

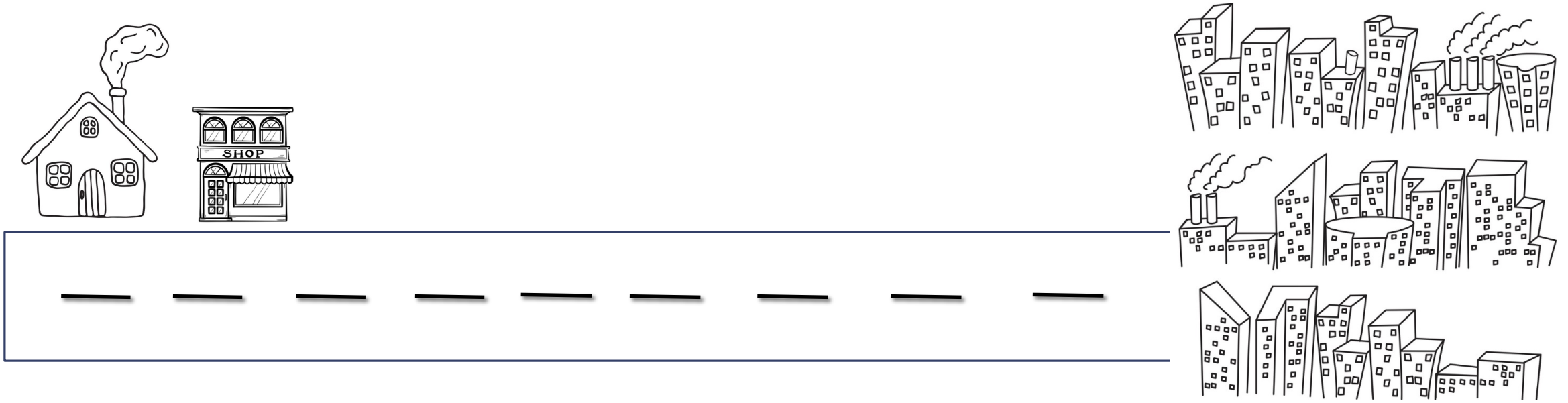
3

Increase availability in consumption

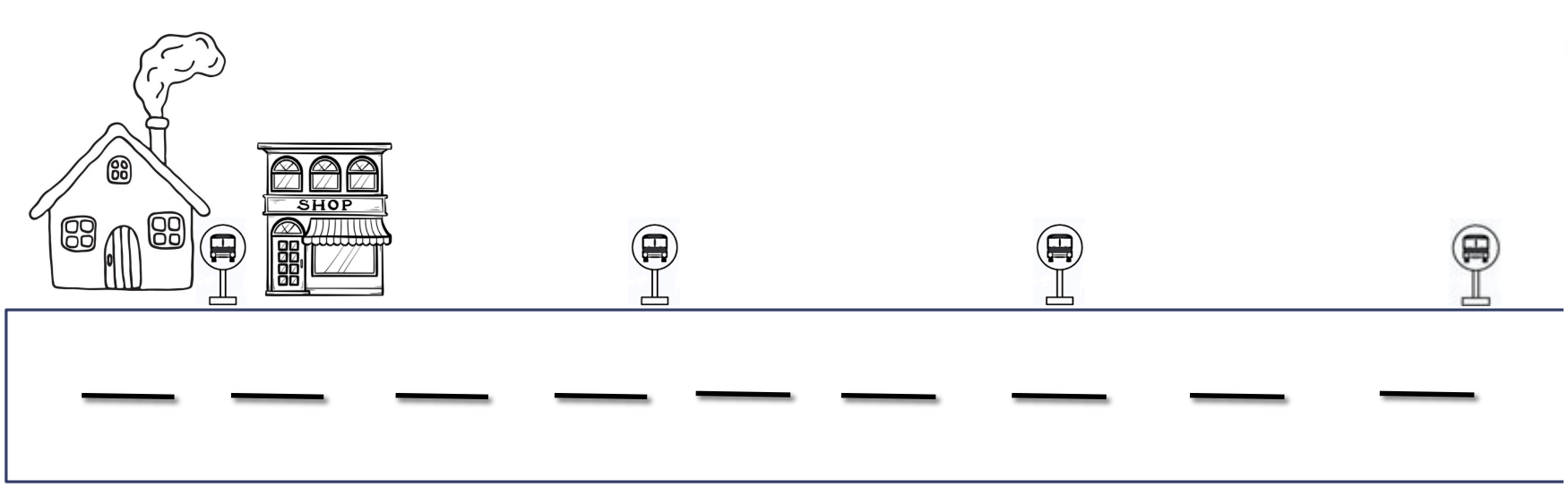
Entrepreneur living in an isolated area of the region

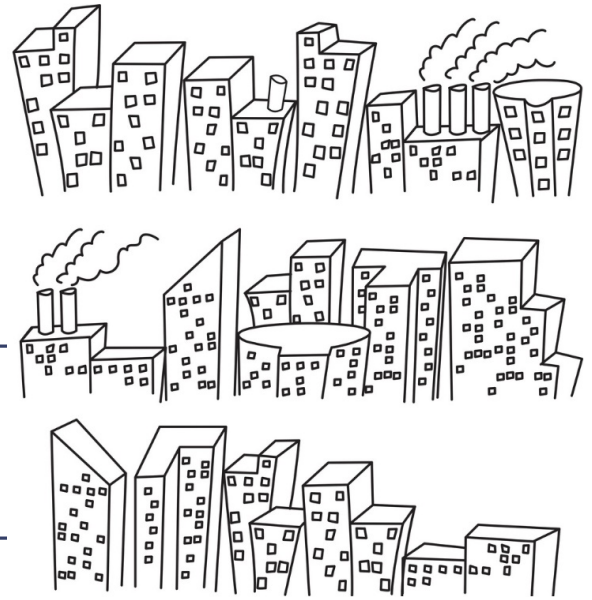


The entrepreneur opens up a business

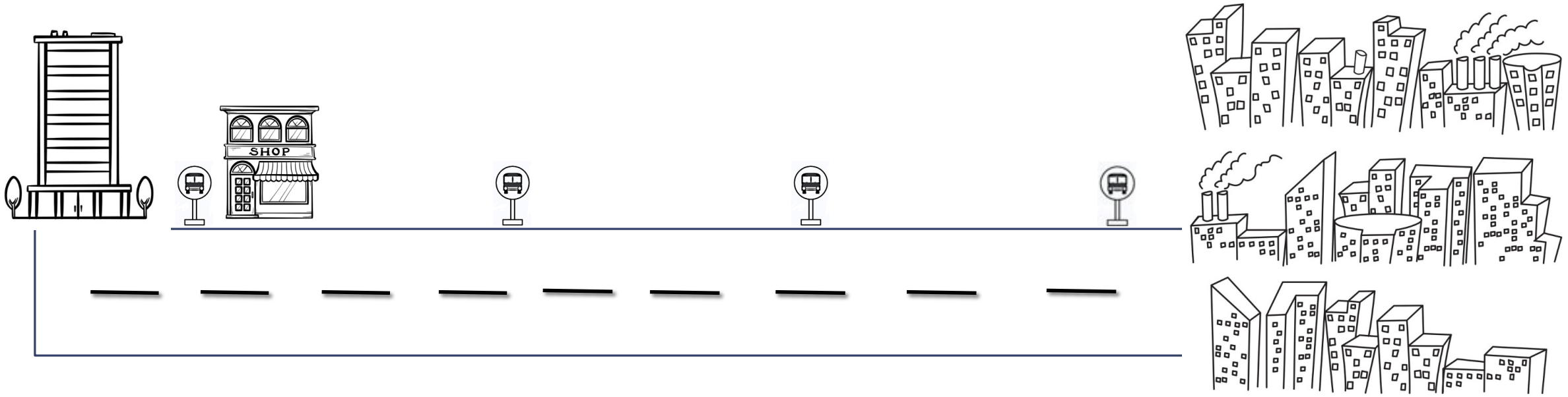


A rapid transit scheme is implemented

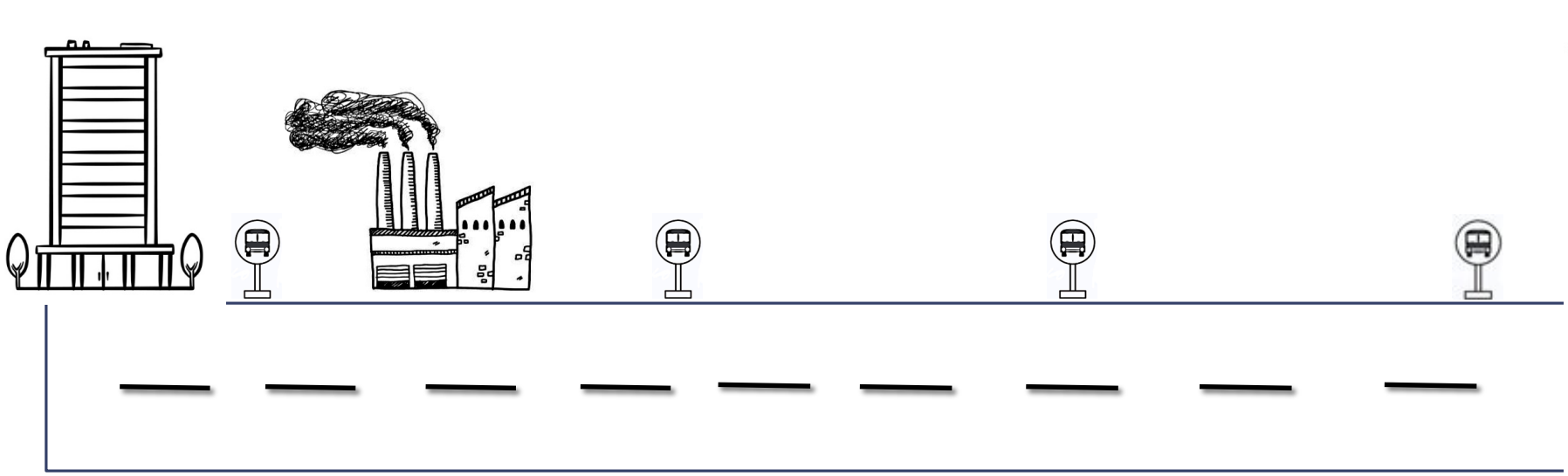


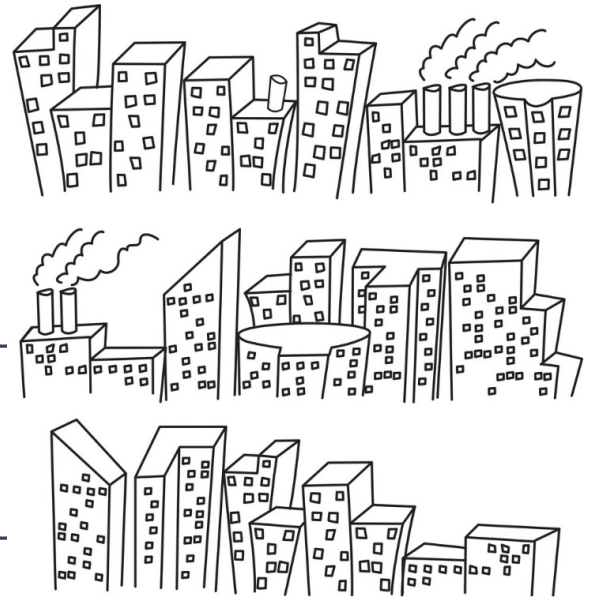


Workers begin to relocate resulting in densification

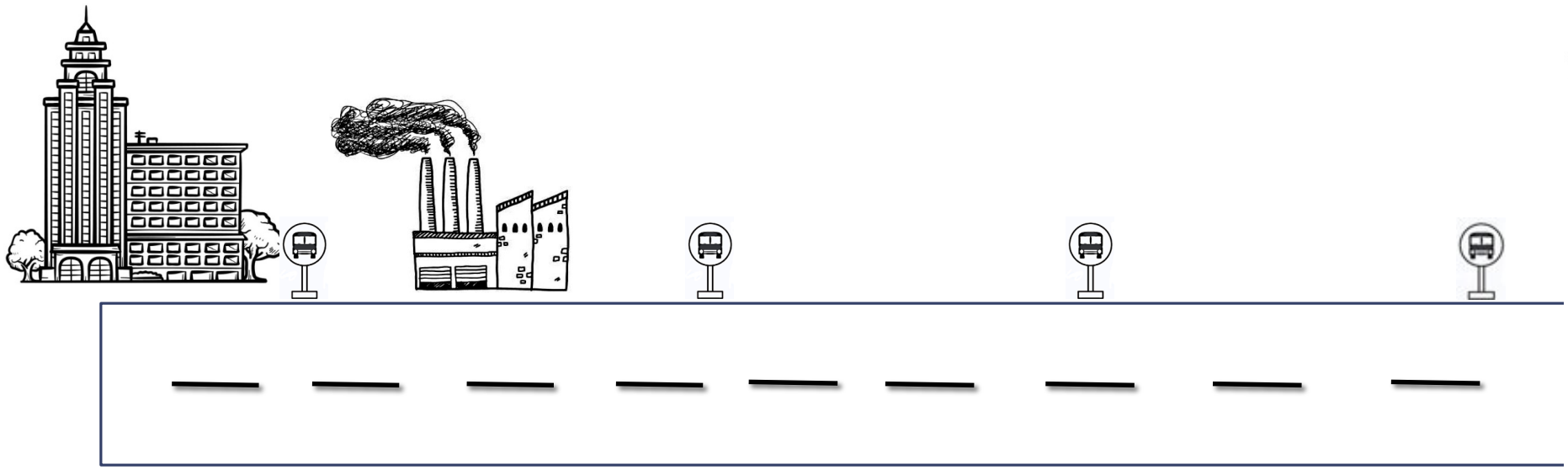


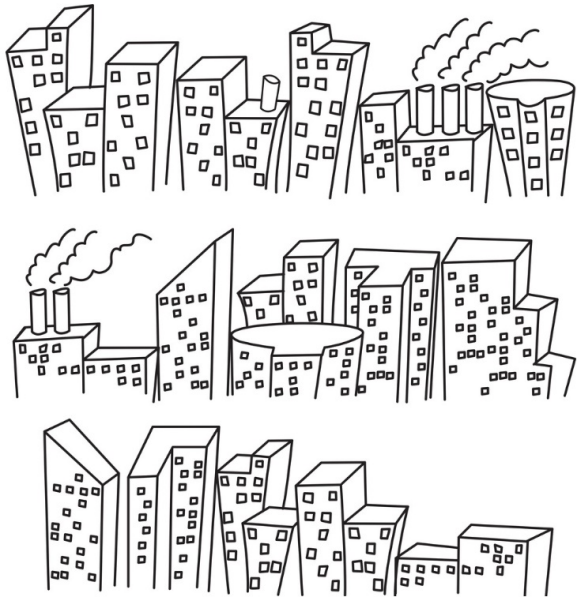
The size of local labor market increases



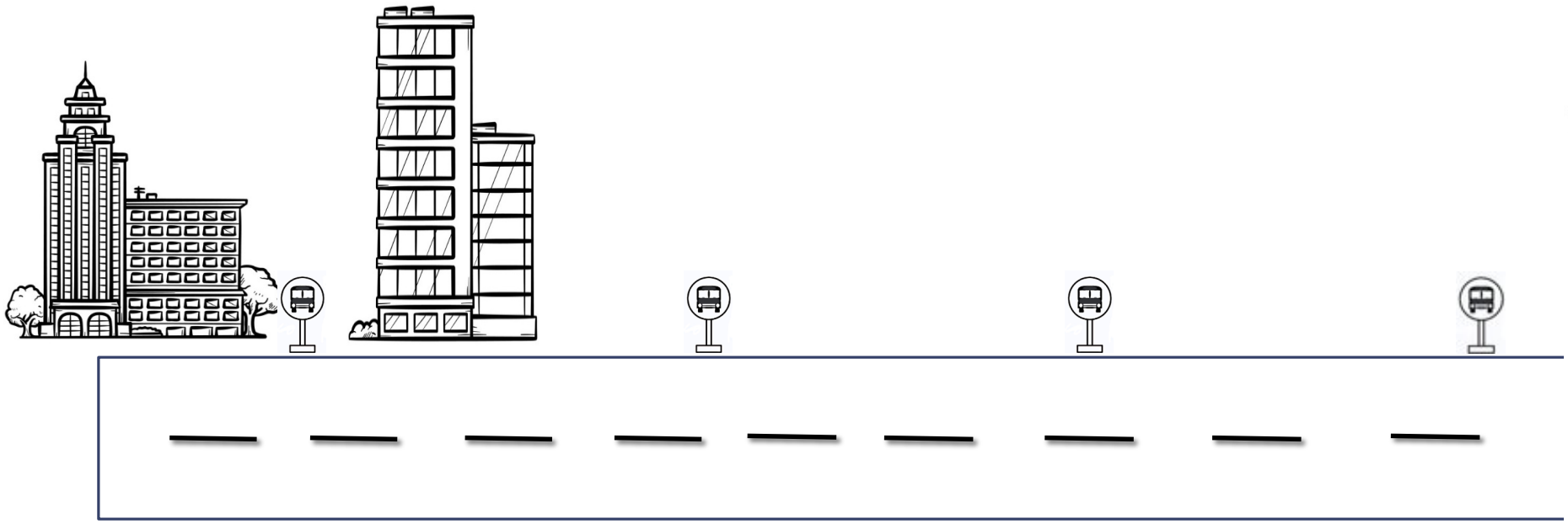


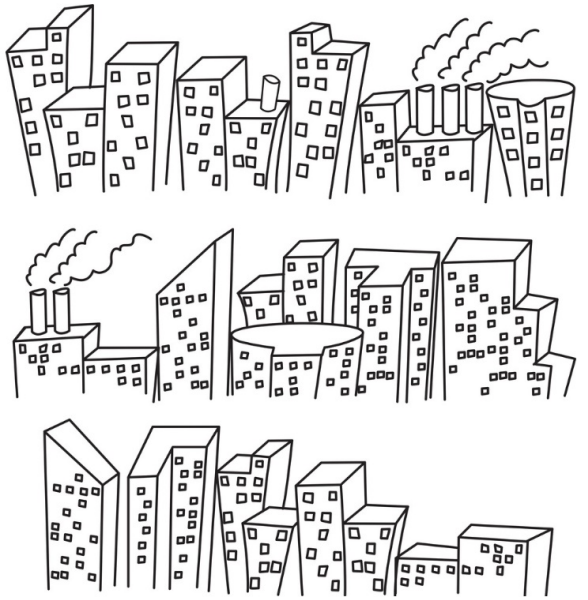
Urbanization economies



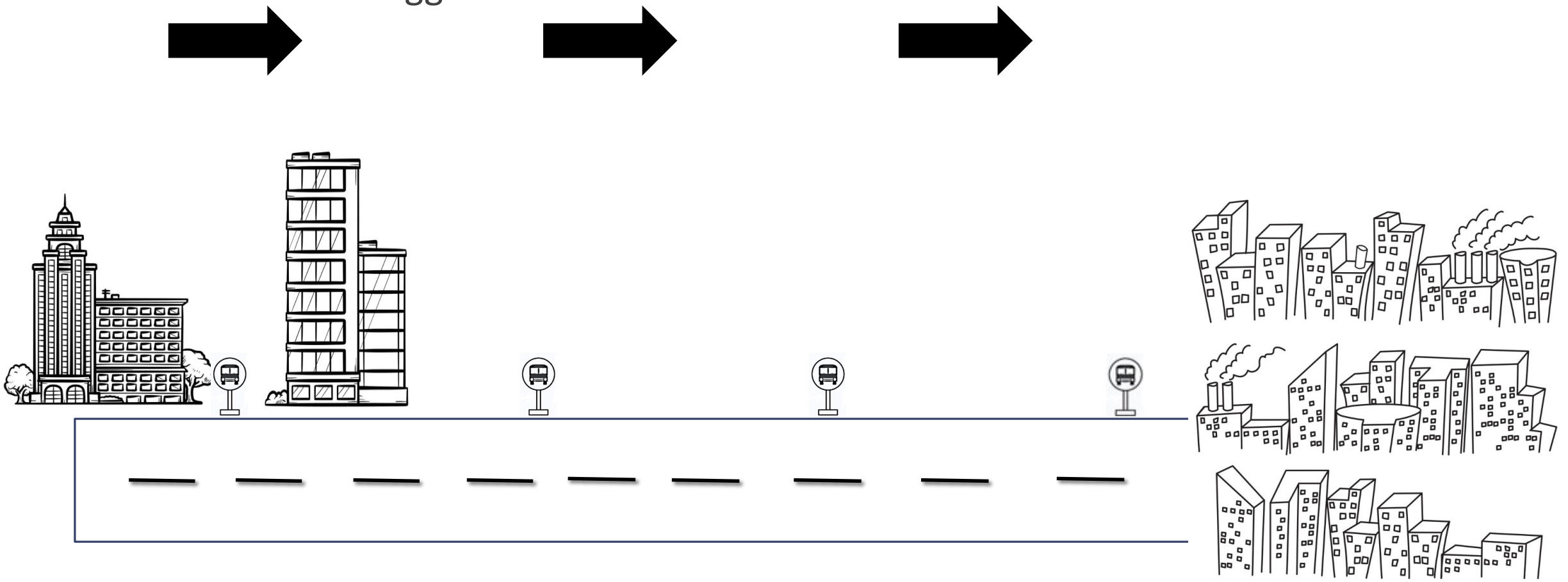


Localization economies

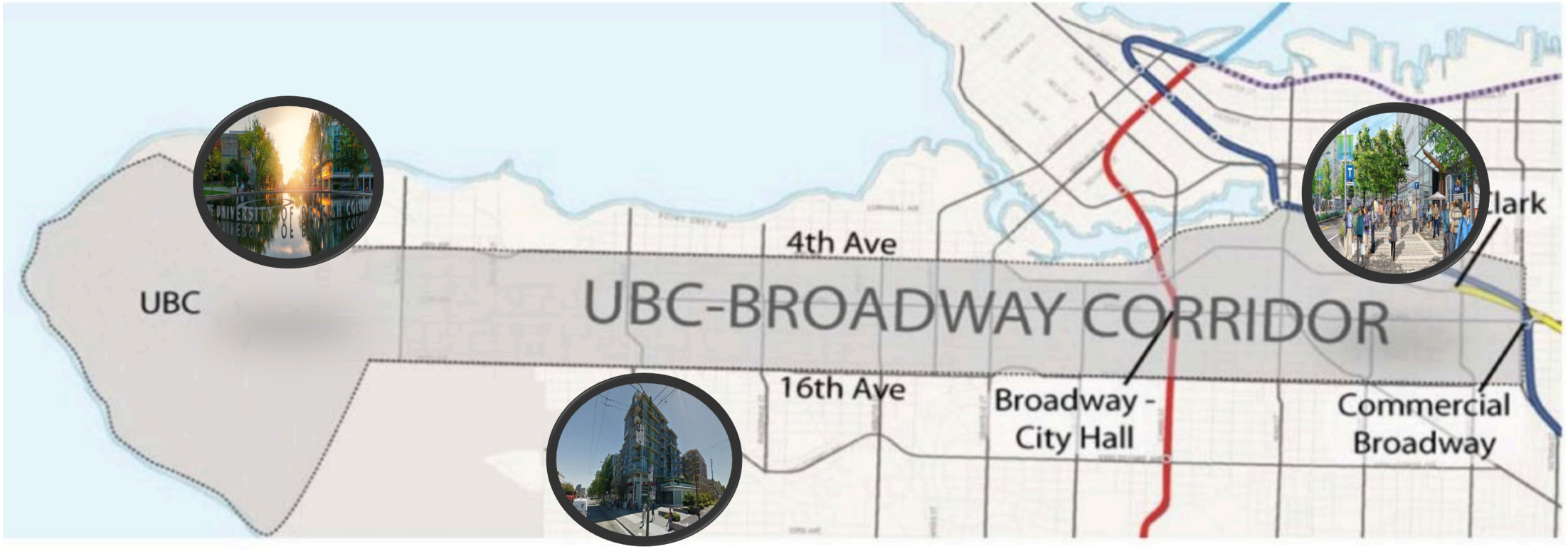




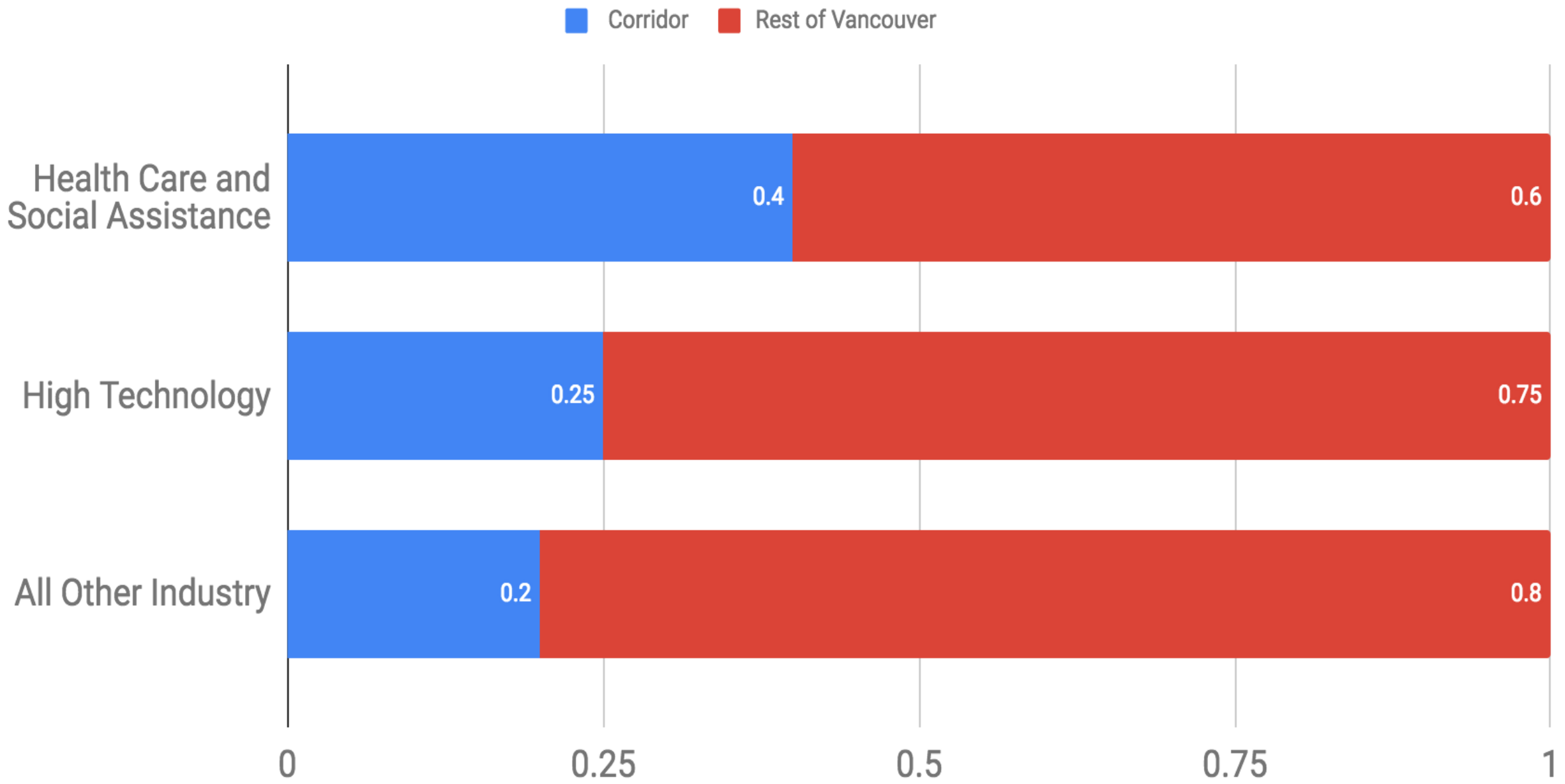
Agglomeration economies



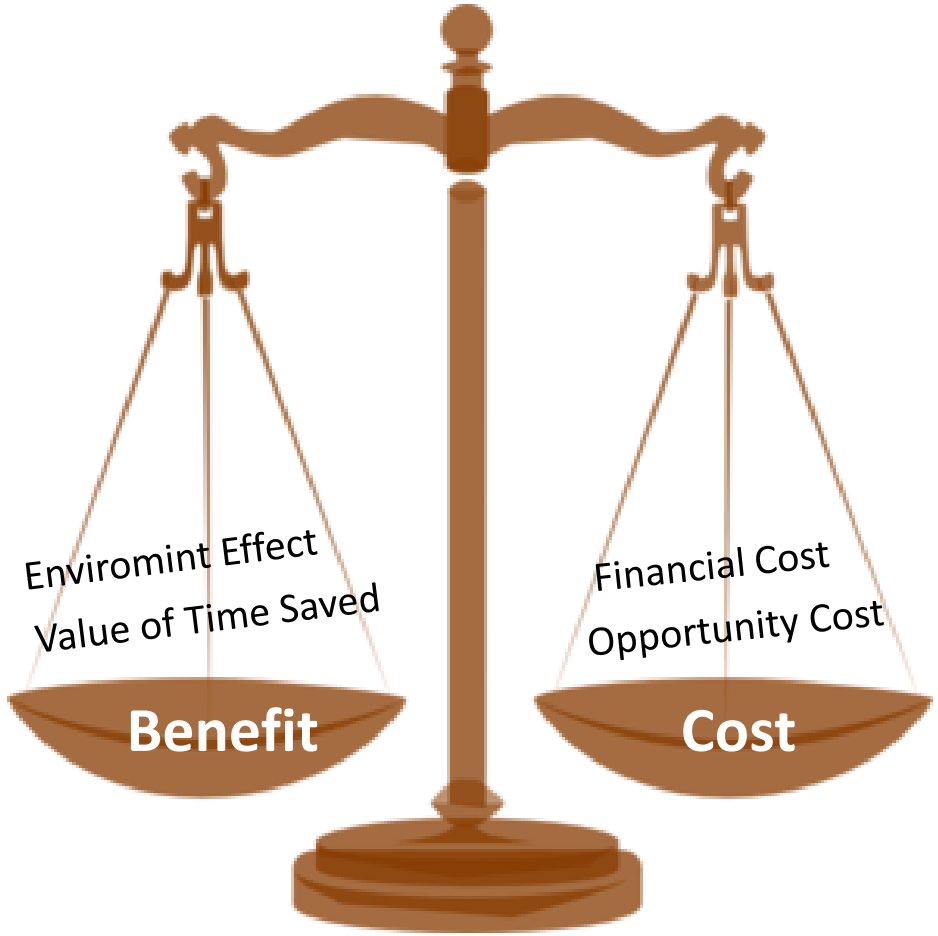
Region of Analysis (UBC-B-C)



Percentage of Vancouver Business Counts Located In The Corridor



Cost Benefit Analysis (CBA) on UBC-B-C



- CBA conducted by **TransLink** was a conventional Surplus based computation
- CBA doesn't includes agglomeration localization and urbanization benefits

Agglomeration Analysis On UBC-B-C

- Agglomeration Benefits are Value Added into the CBA
- Finding a number that represents these benefits in UBC-B-C after the potential project
- Isn't an recommendation of the feasibility of the project.

Methodology

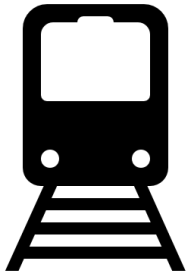
1. Calculating the Effective Density

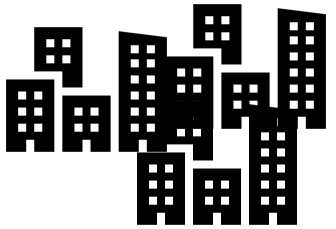
2. Estimating Agglomeration Elasticities

3. Quantifying the Agglomeration Benefits Arising from the Transport Scheme

Calculating Effective Densities

The effective density (ED) represents the proximity between zone area in respect to its employment population.



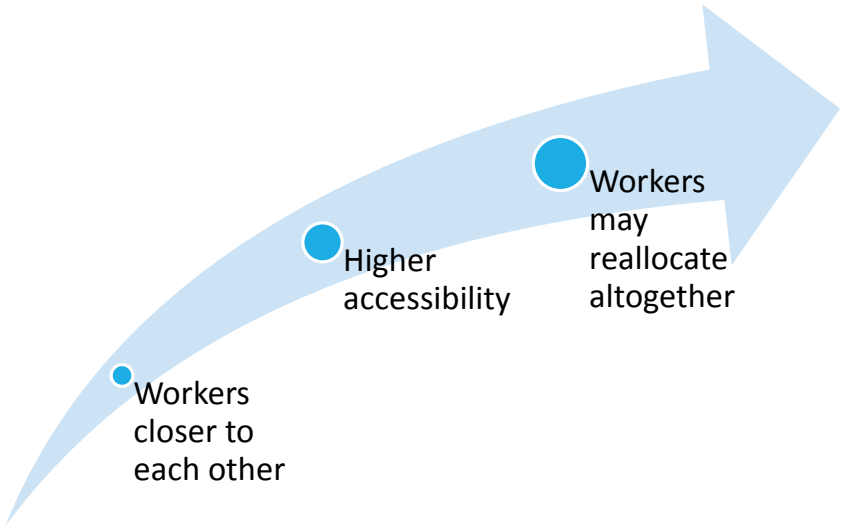


Calculating Effective Densities

Equation:

$$Effective\ Density = \frac{Employment\ Level\ of\ a\ Particular\ Industry}{Generalized\ Travel\ Costs}$$

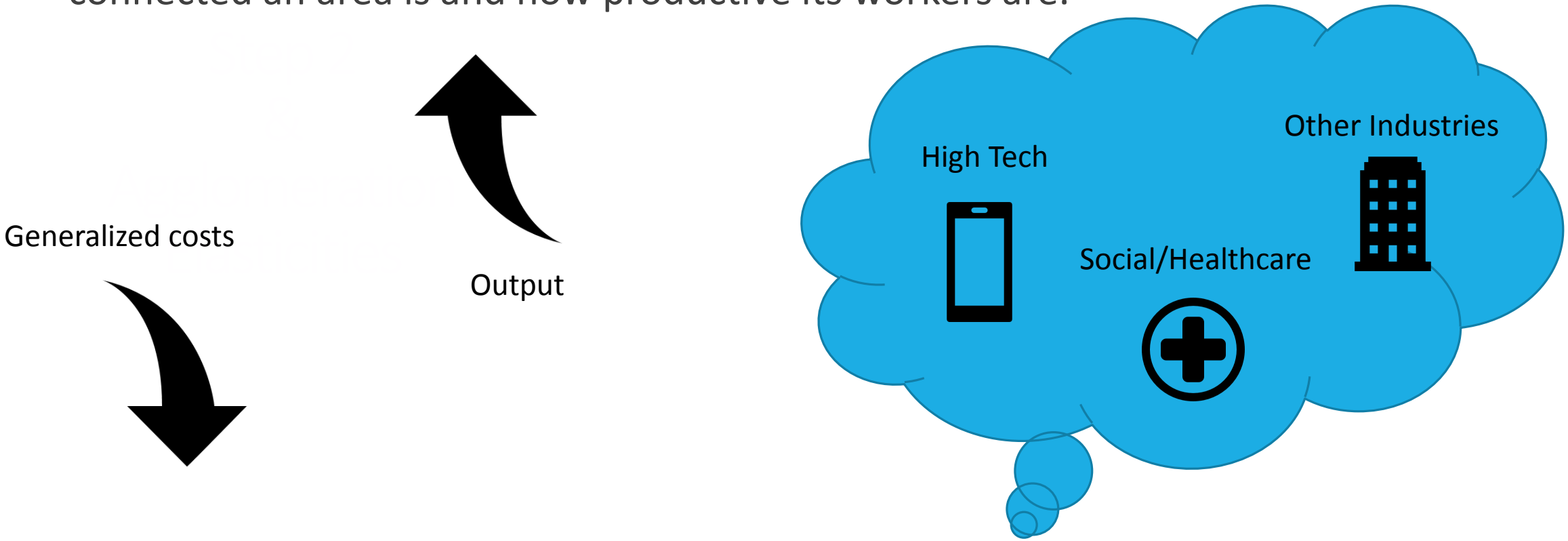
As General Transportation Costs fall...



Jobs are brought closer together!

Estimating Agglomeration Elasticities

Agglomeration Elasticities - measure the relationship between how well connected an area is and how productive its workers are.

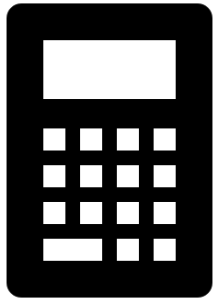


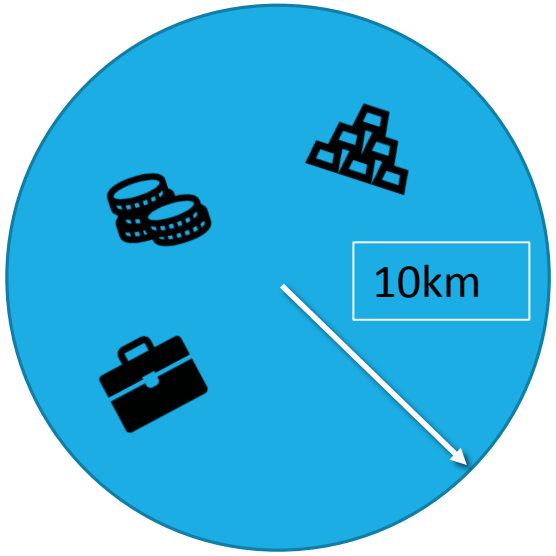
Agglomeration Elasticities

Industry, Category	The Healthcare Industry, Service Industry	The High Technology Industry, Economy Industry	Other Industries
Mean Agglomeration Elasticity (Median for all other Industries)	0.148	0.031	0.028
Range	-0.219,0.503	-0.8, 0.25	-0.310, 0.3

Quantifying the Agglomeration Benefits Arising from the Transport Scheme

Superzone – a zone containing several lesser zones; a tool to simplify our calculations.

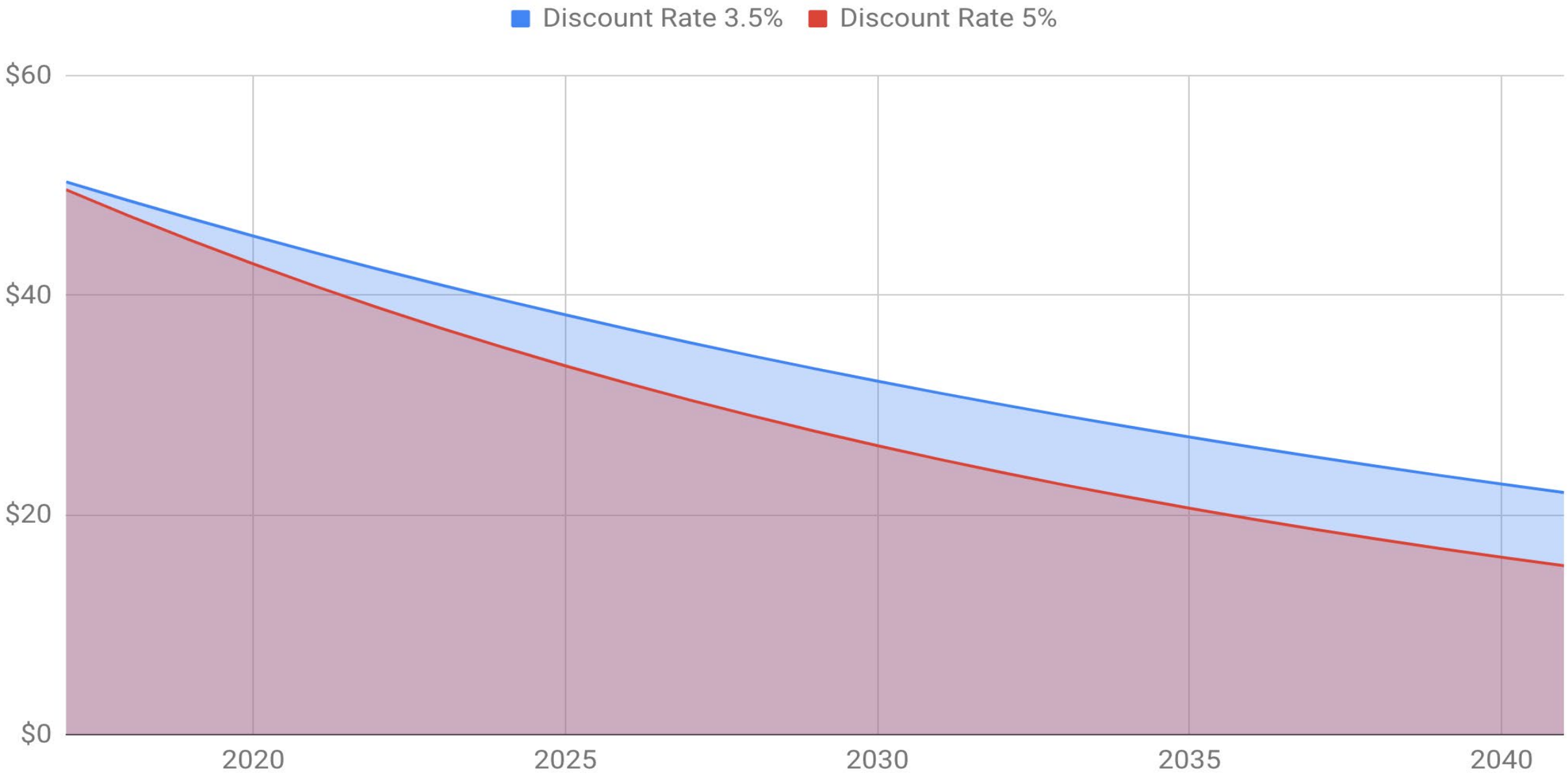




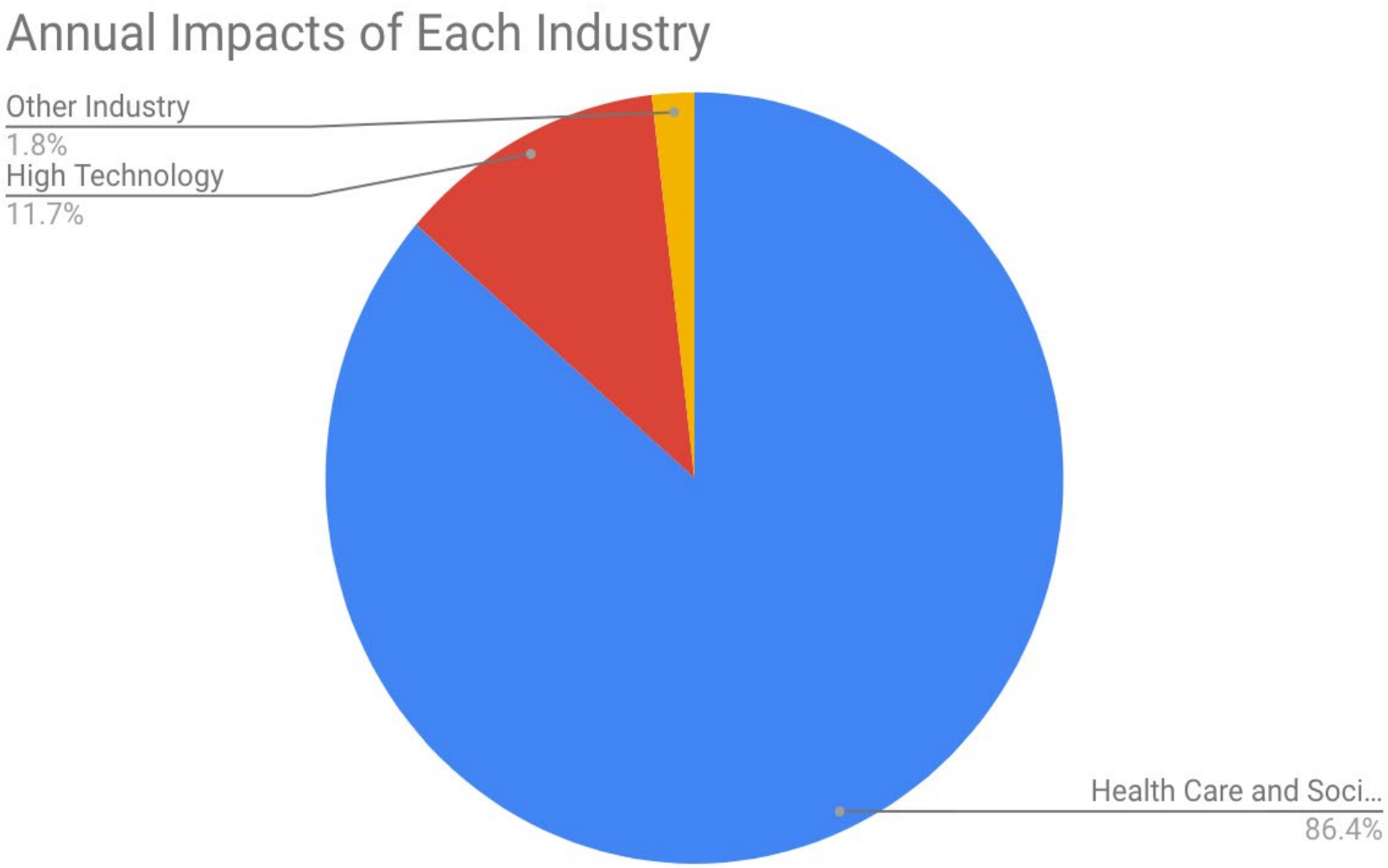
Benefits

$730 TO $860 MILLION ($2016)

NPV Of Benefits Over Time (Millions)



Health Care and Social Assistance Industry



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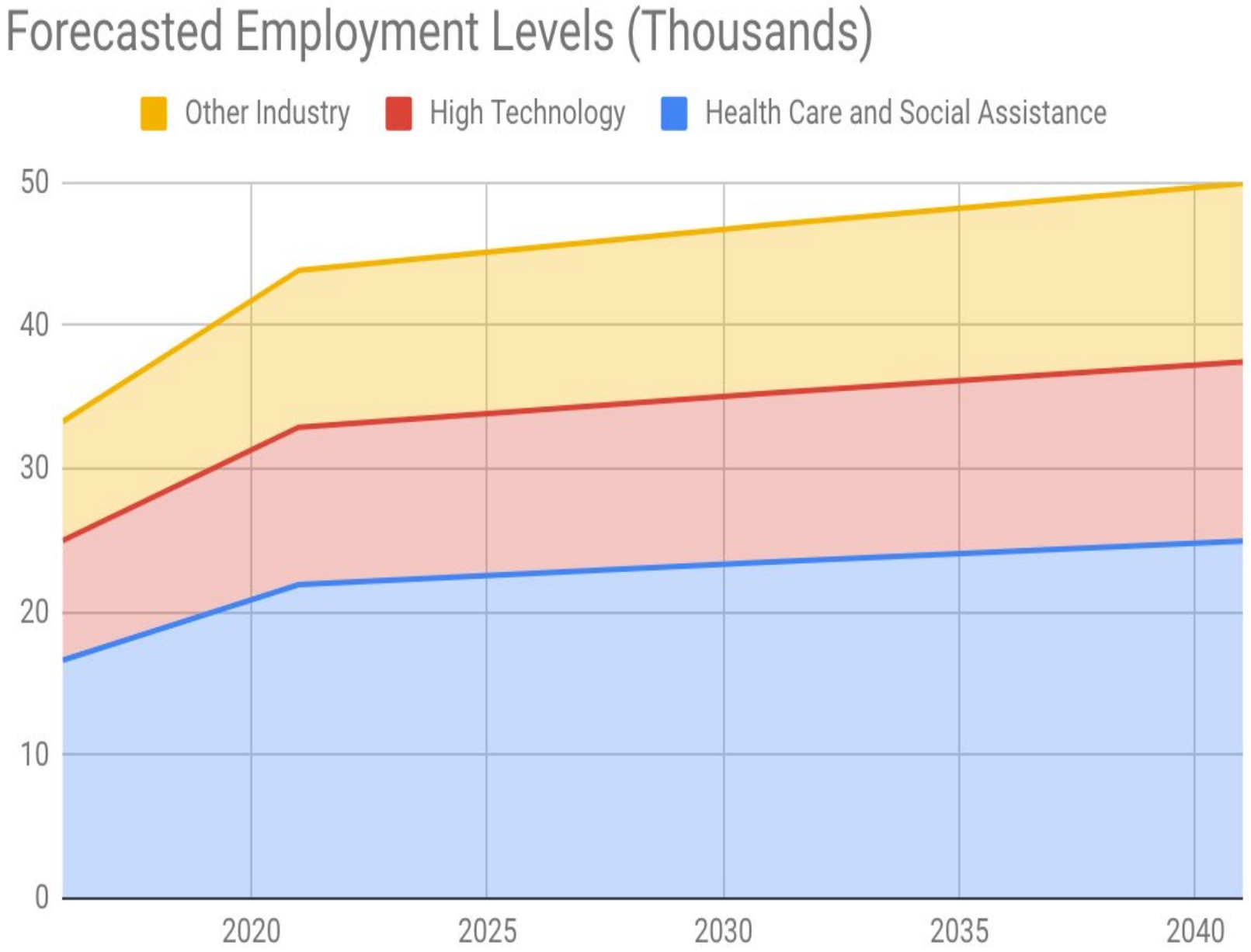


Public Sector Sensitivity Analysis (Millions)

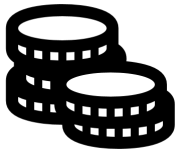
Limitations on Assumptions

- We assumed that Business Count Shares would represent levels of Employment
- We assumed that Generalized Travel Cost wouldn't change over time
- We assumed the Share of industry GDP in BC would be 1:1 with the Share of Industry GDP in Vancouver
- We used a Super zone instead of Traffic Zones
- Agglomeration Elasticity

Direction for Further Assessment of Wider Benefits

We recommend to:

- Use ***different*** agglomeration elasticities
- Look at the agglomeration economies ***outside of the corridor***.
- ***Not*** to use superzone and look at individual sectors instead
- Try and ***forecast*** changes in generalized travel costs
- Conduct research that focuses on finding agglomeration elasticities that focus on the ***public sector***



Thank you for listening!