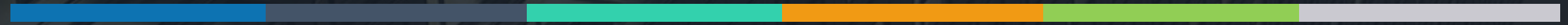




INCREASING HOUSING AFFORDABILITY IN TORONTO



TKS x

SIDE WALK
LABS



Objective

#1 - The Problem

**#2 - What Sidewalk Labs is
currently doing**

#3 - Our Plan

#4 - The Outcome

Executive Summary

INCREASING HOUSING AFFORDABILITY IN TORONTO

The Problem

In the past 28 years, Toronto has been one of the main hubs of price hikes in housing, due to it being one of the most developed and resourceful cities in Canada. Only 20% of Toronto families can afford an average house.

Our Solution

Using robotics to lower the annual maintenance cost of a condo, while simultaneously reducing the cost of building resources.

The Outcome

*Residents of the building would pay a reduced maintenance fee, and could save up to **\$13,183.60 annually.***

Meet Mark Delisi

SIDEWALK LABS RECOMMENDATION



Mark is a 23 year old Canadian citizen who was based in Toronto. Working in the Ad industry, he was paying more than one third of his monthly salary to live in an house downtown. Paying roughly \$1,200 a month for his portion of a four-bedroom house. Mark moved out when his room's ceiling collapsed from water damage. Few months later, he is still struggling to find a affordable home to rent.

Shared House

Mark is working in the Ad industry, was paying more than one third of his monthly salary. Paying roughly \$1,200 a month for his portion of a four-bedroom house.

Moving Out

Mark moved out when his room's ceiling collapsed from water damage.

Still Looking

Few months later, he's still subletting from a friend while he struggles to find a new and affordable place to rent.

I have all the different alerts set up on my phone from all the different rental sites in Toronto. There's nothing really within a regular person's budget.

IMPROVING THE SIDEWALKS PROJECT

1. Use Of Robots
2. Integrating Multiple Language Translations
3. Cheaper Resources

Incorporating Robots into Concierge and Building Maintenance

SIDEWALK LABS RECOMMENDATION



01.

Multi-lingual Concierge

Toronto is a diverse city, with residents often coming from different areas in the world and potentially not being fluent in english. The robotic concierge would remove any language barriers which may stand in the way of clear communication, as it would have the ability to understand and translate any language. People have to pay highly inflated prices for concierge services.

But investing in a robotic concierge, is a one time expense and saves the tenants a lot of money long term.



02.

Snow Shoveling

Buildings usually have contracts with snow shovelling companies. Each of these companies charge approximately \$75-95 everytime they shovel snow. Because of this reason buildings usually clear snow only when it is 6 inches or more. Using snow shoveling robots would allow buildings to clear snow whenever needed.



03.

Lawn Maintenance

Maintenance workers are expected to mow lawns, and maintain shrubs, and hedges that surround the building. Replacing the lawn maintainers with robots, would allow a much more efficient and easier way to mow lawns, and maintain the exterior design of a building.



04.

Building Maintenance

Replacing building maintenance facilities with vacuuming and waste sorting robots such as roombas, would help lower the maintenance cost that the resident of the building might pay.

Summary: Improving Sidewalk Labs Product

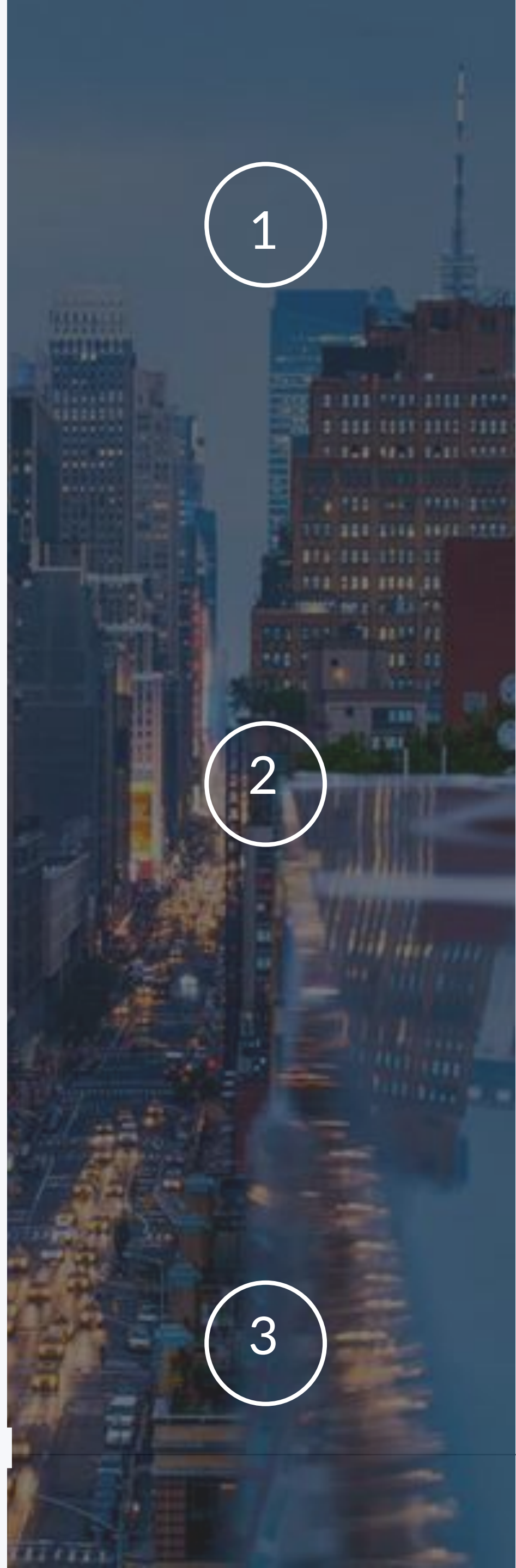
SIDEWALK LABS RECOMMENDATION

Sidewalk Labs is currently attempting to reduce housing costs in Toronto by using more sustainable resources for the buildings (eg, tall timber for construction). Housing costs would be reduced by a significant amount if SideWalks implements these ideas in their solution - Using robots, providing multilingual translation in robotic concierge system, and integrating all of these while using cheaper building resources.

An estimated of only 20% of torontonians can afford housing



The use of robots in the maintenance of buildings would decrease housing costs by at least 23%



1

#1 - USE OF ROBOTS:

Robotics is a new and emerging technology that has proven itself to be very useful in the past. Crowne Plaza, a hotel in San Jose Silicon Valley, has recently started using a robot (named DASH) to perform all house deliveries. DASH delivers items to residents of the hotel when needed. Using a robot instead of people lead to Crowne Plaza reduce their outflow by x%. This example showcases that robots may be a heavy one time investments right now, but will definitely save money in the long run.

#2 - INTEGRATION OF LANGUAGES

Toronto is a very diverse and welcoming city. The residents of Toronto are often from different parts of the world and may not speak english. If robotics is implemented within buildings, residents may find it easier to ask for help in their native language if needed. The robotic concierge would remove any language barriers which may stand in the way as it would have the ability to understand any language which a person would be speaking in. An example of a robot concierge is Connie. In 2016, Hilton and IBM partnered to create Connie, the resident robot at the McLean hotel in Virginia branch.

#3 - CHEAPER RESOURCES:

Using materials such as laminate flooring instead of original wood, cultured marble instead of pure marble, and replacing the usage of granite as a countertop material with tile, would result in decreased outflow while constructing a building from ground up.

2

3

Meet Kobi

SIDEWALK LABS RECOMMENDATION

Kobi is a fully autonomous, all-season yard robot. It come with a set body and three interchangeable head parts.



Kobi can be used as a snow blower during the winter season, even if snow is under 6 inches!



Kobi is fully equipped to mow your lawn during the summer and spring seasons!



Kobi has the ability to act as leaf blower during fall!

SNOW SHOVELING AND LAWN MAINTENANCE BY KOBI

SIDEWALK LABS RECOMMENDATION

Buildings usually have contracts with snow shovelling companies. Each of these companies charge approximately \$75-95 everytime they shovel snow. Because of this reason buildings usually clear snow only when it is 6 inches or more. Using snow shoveling robots would allow buildings to clear snow whenever needed. Using a robot for lawn maintenance would provide and easier and more efficient way of exterior designing.



Pros

1. *Doesn't have to be paid annual fees unlike workers*
2. *Snow can be cleared whenever needed, even if under 6 inches*
3. *It can regularly keep the area around the building clean and safe*



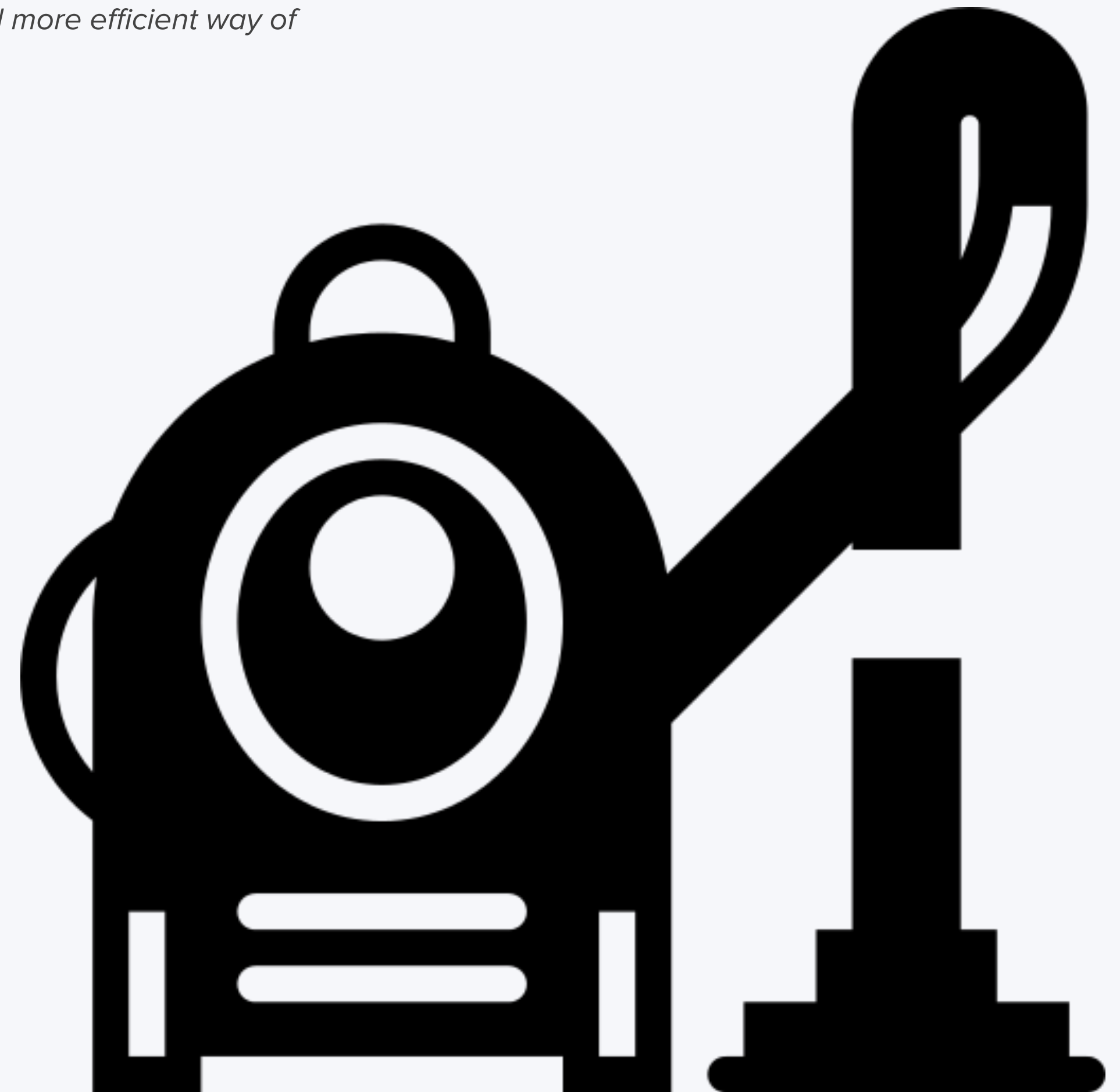
Cons

1. *residents may have difficulty adapting to the increased use of robots in the building*
2. *The robot may malfunction*
3. *Battery*



Cost

1. *Reduces the maintenance cost because it doesn't have to be paid*
2. *External companies don't have to be paid for snow shoveling and lawn mowing services*



Maintenance Costs versus Robotics

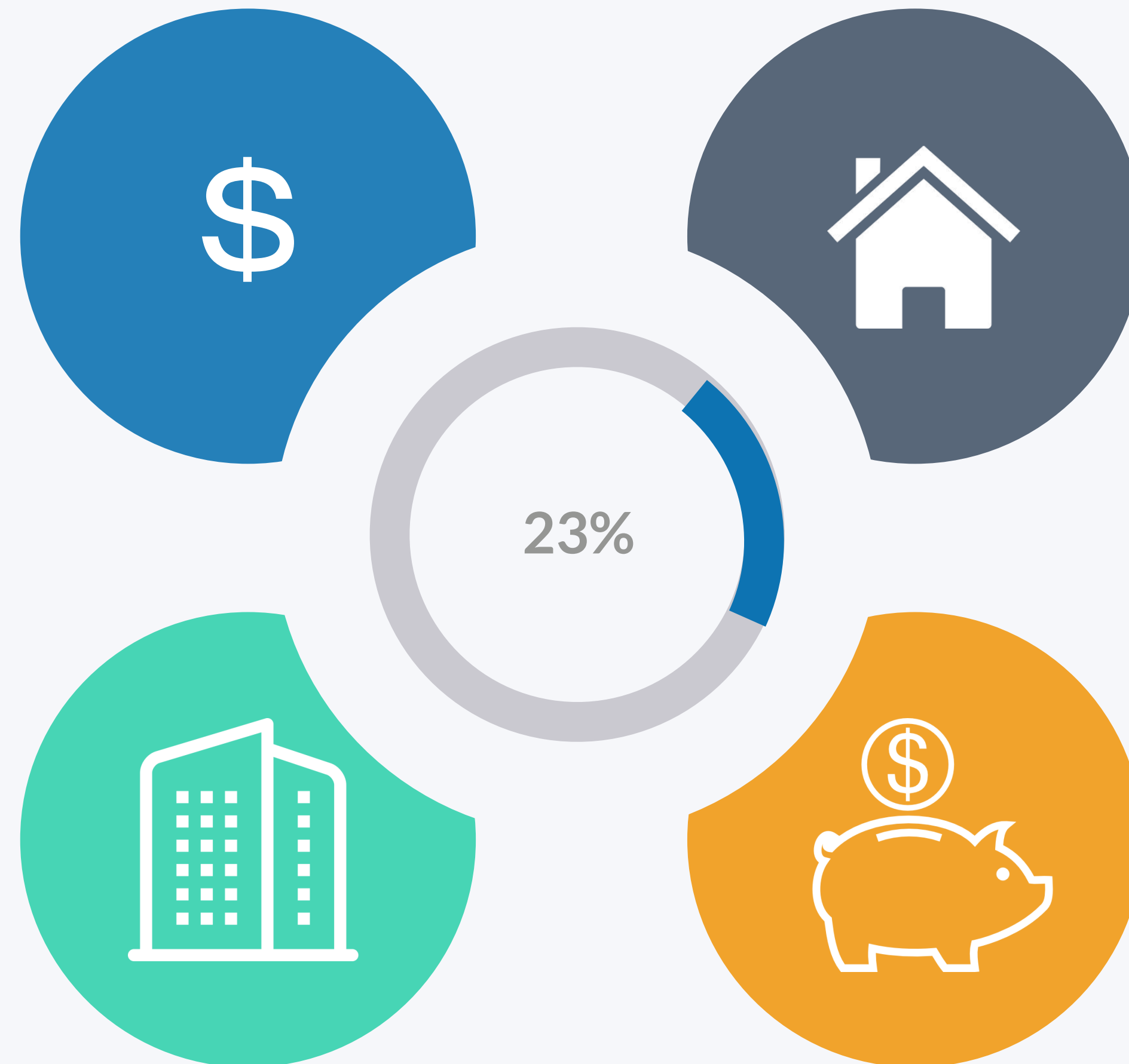
SIDEWALK LABS RECOMMENDATION

Torontonian Earnings

The average Torontonians earns about **\$78,737 per year**

Annual Building Outflow

The annual Building outflow is **\$329,590**



Rent

Cost of rent in Toronto on average for a one-bedroom apartment is **\$27,600 annually.**

Total cost saved

Residents of the building would pay a reduced maintenance fee, and can save up to **\$13,184 annually.**

Maintenance vs. Robot Costs

SIDEWALK LABS RECOMMENDATION

An average citizen of Toronto makes approximately **\$78,373 annually.**

Average cost of rent in Toronto for a one-bedroom apartment is **\$27,600 annually.**

Combining rent costs with maintenance costs, the average Torontonian spends **\$40,783.60 on living costs annually.**

Spending **\$40,784** on living costs is **52.04% of an average Torontonian salary** → this is over half! A Torontonian spends approximately **\$13,184 per year just for maintenance**

If we replace maintenance with robots, this would cost **\$76,000 total.**

Replacing maintenance with robots would **decrease total costs by 23%.**

$\$4,000/\text{Kobi} \times 4 = \$16,000$
 $\$2,000/\text{self-charging roomba} \times 30 = \$60,000$
 $\$16,000 + \$60,000 = \$76,000$



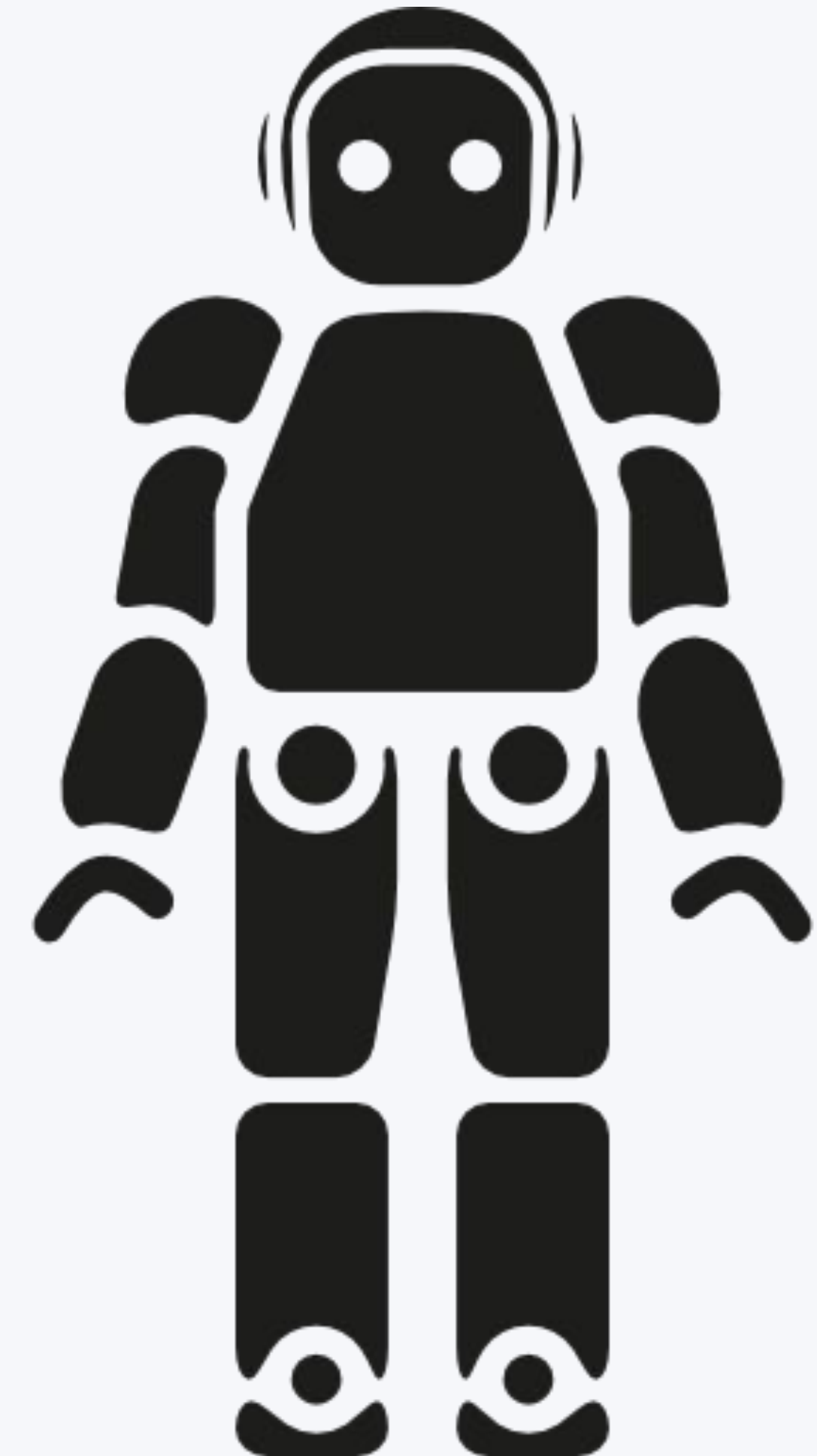
CREATING A MULTILINGUAL ROBOT

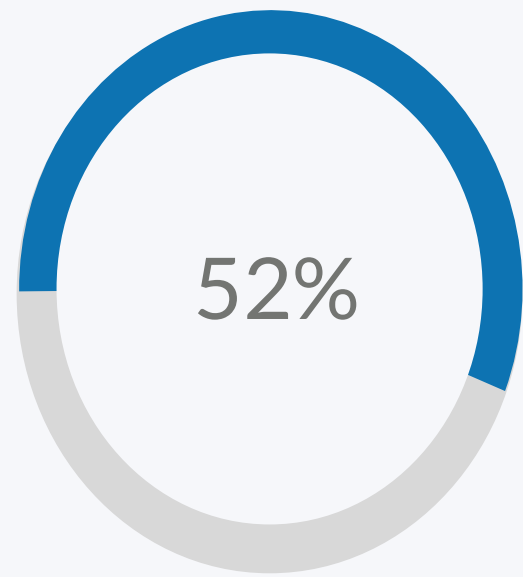
SIDEWALK LABS RECOMMENDATION

Residents would feel more comfortable interacting in their preferred language

The robot would be able to understand ANY language

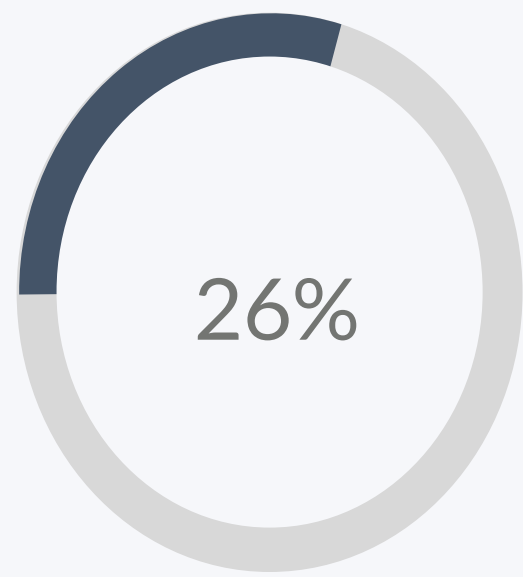
The language barrier would be greatly reduced





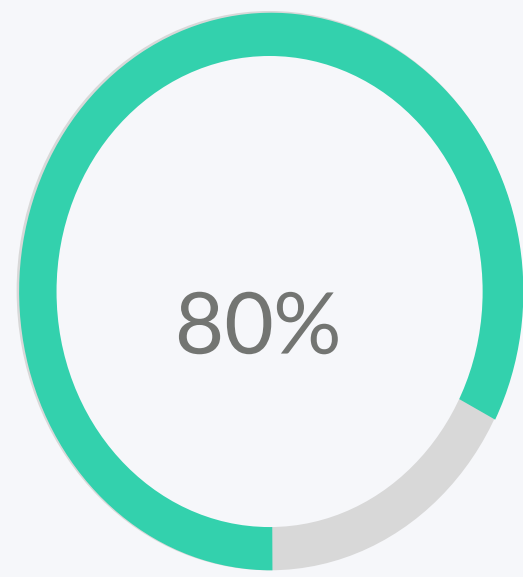
Residents Prefer talking in their native Languages

52% of the people feel more comfortable having conversations in their native languages



Top non-official languages in Canada

Mandarin, Cantonese, Filipino, Hindi, and Italian make up 26% of the languages spoken in Canada



Helping all the residents

With only 12 languages, it can help 80% of the residents of the building.



Three Resource Changes

SIDEWALK LABS RECOMMENDATION

Substituting materials such as Wood flooring, Marble, and Granite with Laminate and cultured marble would reduce the cost of building resources resulting in a cheaper price of the house.



The Summary

SIDEWALK LABS RECOMMENDATION

USE OF ROBOTS:

Using robots such as Kobi and Roomba cuts building maintenance, and lawn and snow maintenance costs almost completely. Using multifunctional robots such as Kobi would allow buildings to clear snow whenever needed without having to pay a company to come and do it. Replacing Roombas with cleaners in the buildings cuts the labor and maintenance cost as well.

INTEGRATION OF LANGUAGES:

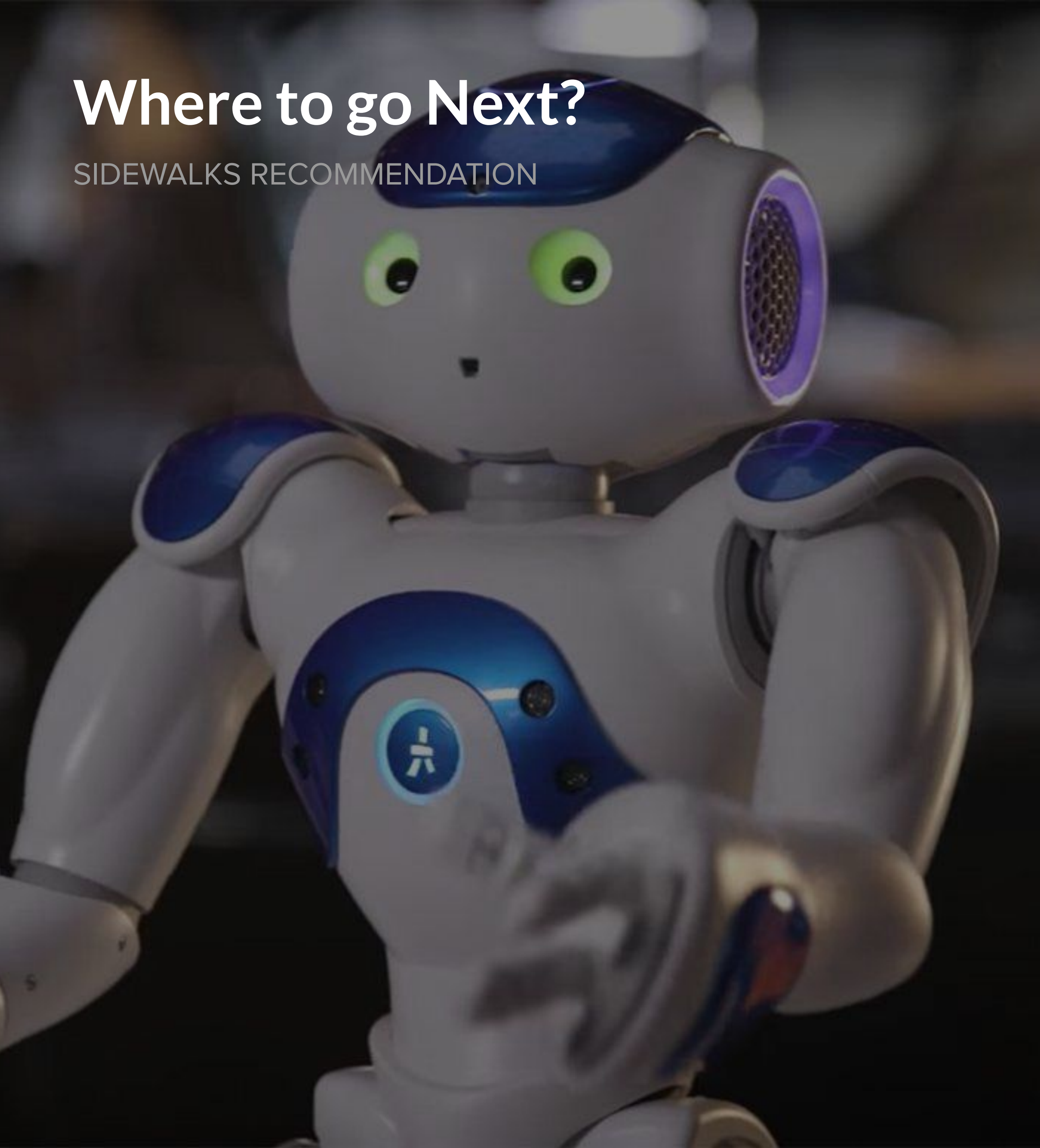
Building a multilingual concierge system for the apartment would help residents coming from different areas of the world to communicate freely in their own languages. Having a multilingual concierge system is a worthy investment as it completely cuts the cost of paying for concierge workers in the future.

CHEAPER RESOURCES:

Using materials such as laminate flooring instead of original wood, cultured marble instead of pure marble, and replacing the usage of granite as a countertop material with tile, would result in greatly decreased outflow when constructing a building from ground up.

Where to go Next?

SIDEWALKS RECOMMENDATION



In 2016, Hilton and IBM partnered to create Connie, the resident robot at the McLean hotel in Virginia branch. The robot tells guests about nearby attractions, places to eat, and hotel information. Doing work very similar to that of a concierge.

On the other hand we have Google Translate, which is a multilingual machine translation service developed by Google. It supports over 100 languages. It enables people to translate media such as images and audio into any language of their choice.

The Goal is to get Hilton and IBM to collaborate with Google to build a Multilingual Concierge Robot. This would greatly support residents from various areas around the world with a better communication experience. This would take robot assistance to a whole new level.

Who to contact?

SIDEWALK LABS RECOMMENDATION



Mark Foster

Senior Vice President, IBM Services and Global Business Services. Contact to enquire about the Connie Project.

Linkedin: [Mark Foster LinkedIn](#)



Christopher J. Nassetta

President & Chief Executive Officer at Hilton. Contact to enquire about the Connie Project.

Linkedin: [Christopher LinkedIn](#)



Macduff Hughes

Engineering Director at Google. Contact about potential project on building Multilingual Concierge Robot.

Linkedin: [Macduff Hughes LinkedIn](#)

On a More Personal Note

SIDEWALKS RECOMMENDATION

We'd like to thank you for giving us the opportunity to contribute to Sidewalk Labs potential strategies in decreasing costs of housing in Toronto to increase affordability, and therefore enable the citizens of the city to live without having to sacrifice over half of their salary for living costs. We appreciate your commitment to providing us with the information we needed, and the time you have dedicated to making this possible for us.

We hope that we were able to make an impact on the decisions Sidewalk Labs makes concerning the scale of your platform. Please feel free to reach out to the us if you have any questions or comments about our recommendation.

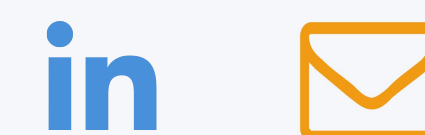
The three of us are extremely excited to see the company strive and become a service that will massively impact the citizens of Toronto.

Thank you!

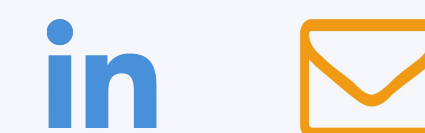
Ariya, Mehar, Sananda, Arqish



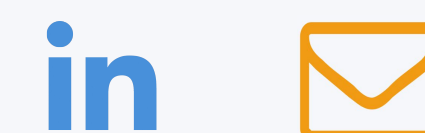
Sananda Kawadkar



Ariya Gupta



Mehar Chatha



Arqish Minhas

