

technology for living

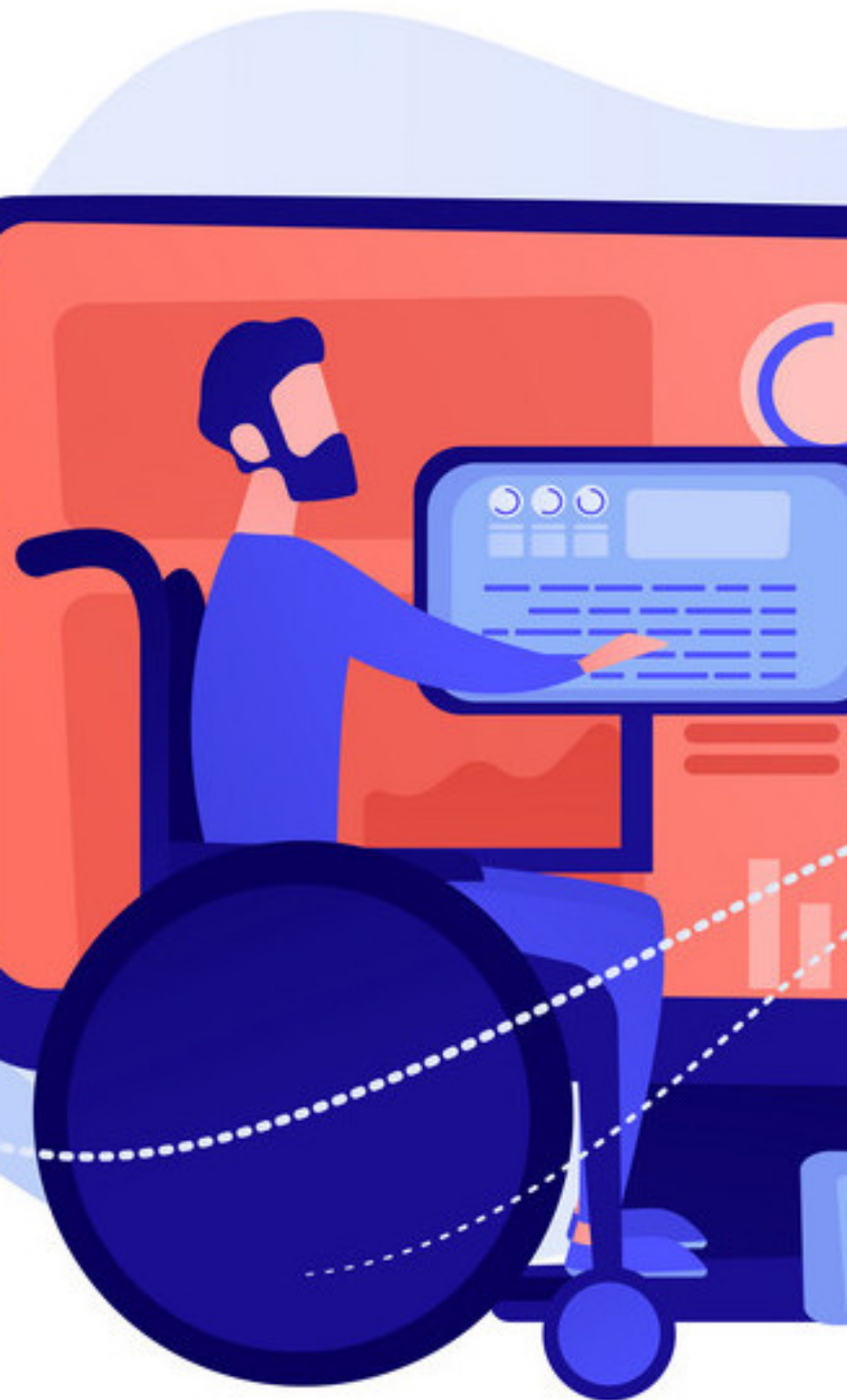


# PROJECT REPORT



180Degrees  
— U B C —

# TABLE OF CONTENTS



## **01**

### EXECUTIVE SUMMARY

---

## **02**

### ORGANIZATION OVERVIEW

---

## **03**

### MISSION AND VISION STATEMENTS

---

## **04**

### ASSISTIVE TECHNOLOGY

---

## **05**

### FINAL RECOMMENDATIONS

---

## **06**

### PROJECT APPENDIX

# EXECUTIVE SUMMARY

**Technology for Living (TFL)** is a non-profit organization that provides individuals who have physical disabilities with assistive technology solutions to help them live as well and as independently as possible.

From September to December 2022, a team from **180 Degrees Consulting UBC (180DC)** worked with TFL on two main objectives:

1. **Supporting TFL in refining mission and vision statements** to reflect the true values of TFL in a concise manner.
2. **Conduct research on the assistive technology industry** to support TFL's strategic planning.

The 180DC team started the project by conducting **internal and external research** to better understand TFL as an organization. They focused on the macro environment and TFL's strengths, as well as their similarities and differences with competitors. The team also looked into examples of mission and vision statements from similar organizations to compare with those of TFL.

Then, the 180DC team conducted **interviews with TFL board members, management, staff, and general members**. These interviews consisted of questions asking the interviewees to relate their unique experiences in TFL to the current mission and vision.

Using the interview results, the 180DC team worked with TFL to draft core values and vision and mission statement candidates. The 180DC team then sent an **anonymous survey to the entire TFL team** to further refine their recommendations for TFL's mission and vision statements. The survey included a section for respondents to rank potential new mission and vision statements.

The 180DC team also provided suggestions and insights on the assistive technology industry and researched TFL's current offerings. They suggested **potential additions to TFL's product mix** based on the previous interviews and their independent research.

Finally, the 180DC has compiled all of their **recommendations** in this project report for TFL's future reference.

# technology for living

## ORGANIZATION OVERVIEW

Technology for Living (TFL), a non-profit organization, was established in 2006, and is dedicated to **helping maximize independence for people with physical disabilities**. It evolved from the Provincial Respiratory Outreach Program (PROP) and the Technology for Independence Living (TIL) Program.

Through collaboration, TFL develops and provides **member-centered technological solutions** to optimize independence. TFL ensures all their services are accessible and equitable so that everyone can exercise their right to self-determination. People can gain the expertise, skills, knowledge, and technology necessary to manage their own respiratory and/or assistive technology through TFL's programs.

Currently, TFL has three main services: **PROP, TIL, and the Peer program**.

PROP provides, installs, repairs and maintains AT **for people who require assisted ventilation**, while also helping in transportation and discharges from hospitals. It is the only service of its kind provided in BC,

TIL **ensures independence at home** by providing intelligent home controls such as tablet control, lamp control, door openers and more.

The Peer Program **helps facilitate connections between members of the community and relevant organizations** to help everyone have an equal opportunity to maximize their independence.

# MISSION AND VISION STATEMENTS: INTERVIEWS

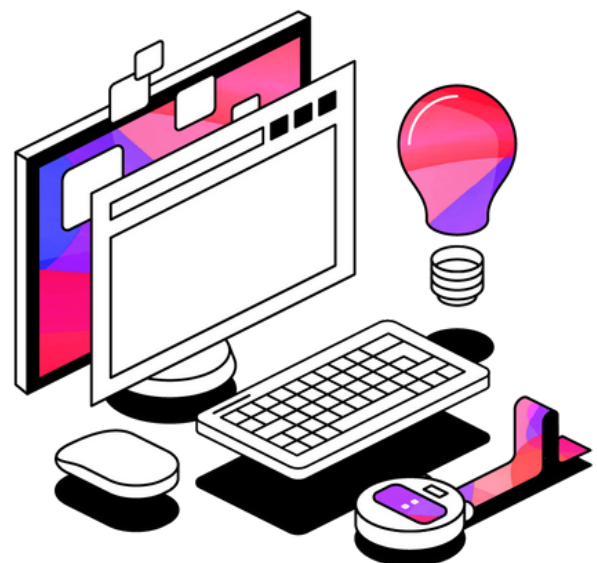
## INTERVIEW DESIGN

The 180DC team conducted 10 video interviews with TFL staffs and members to learn more about TFL as an organization and what they care about most. The interviews started with small talk to set the interviewee at ease, then proceeded with questions that asked about what they do, why did they join, and how has TFL changed over time. Interviewee specific questions were also asked. **The overall goal was to learn what the interviewees value in TFL.**

1. What do you know about TFL's current mission/vision statements?
2. How do you feel about the current TFL MV statement?
3. In one sentence, how would you describe TFL?
4. What do you like the most about TFL?
5. How has TFL changed in recent years, and where do you see it going in the next 5, 10, 20 years?
6. What words come into your mind when I say "TFL"?

## INTERVIEW RESULTS

The interviews provided valuable insights about the internal strengths and values of the organization. Overall, the keywords "**community**", "**independent**", "**home**", and "**people**" came up most frequently in interviews. Some keywords are also generated from the overall interactions during the interview.





# MISSION AND VISION STATEMENTS: SURVEYS

## SURVEY DESIGN

For the survey, the 180DC team wanted to collect a representative sample of the stakeholders of TFL by surveying the Board members, management team, staff, and members to cover all levels of the organization. This way, the results would provide a holistic overview of different perspectives in TFL. In terms of the question design, the team wanted to include **quantitative and qualitative questions** that would generate definitive results and highlight points of improvement. The keywords section is composed of "yes", "no", and "undecided" response options, and the respondents pick out three choices from the mission and vision section. Each section of the survey provided the opportunity for the respondent to give feedback.

The detailed survey results and respondents' feedback can be found in the report appendix, starting from Page 13.

## SURVEY RESULTS

The 180DC sent the survey to 23 individuals and received 21 responses, then analyzed the results of each question quantitatively and qualitatively.

### Keywords section:

- Words like **"community"**, **"independent"**, **"home"**, and **"people"** were most important
- Some **inconsistencies** such as majority of respondents voting "no" for the word "non-medical", even if the word came up often in interviews
- Respondents preferred words with similar meanings but **more positive connotations**
  - "Collaboration", not "build"
  - "Serve/support", not "help"

### Mission and vision section:

- Respondents were asked to rank their **first and second choices** among the proposed mission and vision statements
- Most popular mission statements are **very specific to TFL** by mentioning TFL's services or how they provide their services
- Most popular vision statements **encompassed TFL's services** and included some of their **core values**

# MISSION AND VISION STATEMENTS: TOP PREFERENCES

## MISSION

**(81%) To promote independence at home through assistive technology, respiratory therapy and peer support.**

- Includes TFL's purposes and services, which makes it very specific

**(43%) To maximize independence at home by providing innovative technology and respiratory therapy.**

- All-inclusive statement encompassing the individuals who need technological support

**(33%) To support independence at home for people with physical disabilities.**

- Defines the purpose and overall scope of TFL

## VISION

**(71%) To maximize independence and autonomy at home through the use of technology and respiratory therapy for people with physical disabilities.**

- Captures what exactly TFL does and encompasses a large part of the organization

**(43%) To support independent living at home through innovation, collaboration, and support.**

- All-encompassing statement that highlights the importance of innovation and collaboration

**(29%) We believe that everyone has an equal opportunity to maximize their independence.**

- Reflects TFL's belief that everyone should have equal access to independence regardless of their unique circumstances

# ASSISTIVE TECHNOLOGY: RESEARCH PROCESS

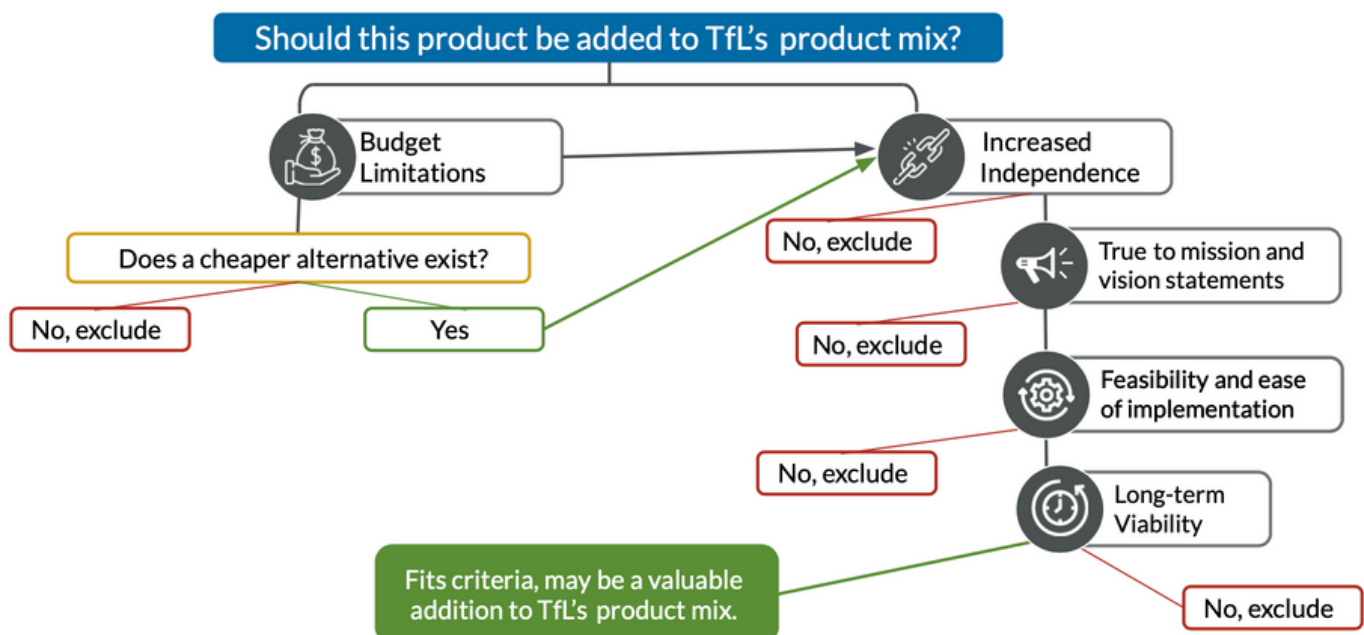
## RESEARCH BACKGROUND

The 180DC team's research came mostly from two main sources, an **interview with Benson Au**, TFL's Assistive Technologist, and their own independent research through **scholarly and news articles**. The biggest factor to consider when researching was the budget that TFL had. With many of the assistive technological innovations being costly, considering low-cost options that fit within TFL's scope was the main focus. Specifically, the team looked for environmental controls as well as other low-cost options that could potentially be implemented in TFL's product mix.

In the team's insightful interview with Benson, he provided important details as to the operations of TFL and how assistive technology is incorporated and researched. He also pointed the research in the right direction and indicated some potential areas of focus to look into, such as the **gaming industry** advancements.

## RESEARCH CRITERIA

The assistive technology industry is incredibly broad. Therefore, when researching possible additions to TFL's product mix, the 180DC team considered the following criteria in order of importance to ensure our recommendations were reasonable and helpful. Checking that the product **increased independence** for TFL's members was of the utmost importance, and checking its **financial viability** was the quickest way to narrow the research as newer technology is more expensive. Next, the team ensured that the product fits well with the anticipated adaptations to the mission and vision statements and considered **ease of implementation** and **long-term viability** so any investments could be held over several years. To formulate these criteria, the team assessed the strengths of TFL's current product mix.

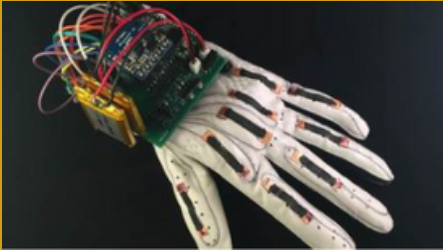




# ASSISTIVE TECHNOLOGY: RESEARCH FINDINGS

## POTENTIAL ADDITIONS TO PRODUCT MIX

The following four products focus on personal assistive technology in the context of communication.



**Smart Gloves:** The Smart Gloves are a low cost option (~\$100USD). Its main function is to translate sign language into text that appears on smartphones or computers, however, we see this design being configured into controlling external environments with pre-stored hand gestures, such as lights and TVs. This technology is still relatively new, and so the design and technology of these smart gloves are bound to improve.

**NOMON & Skyle Eye Tracker:** NOMON is a computer program that allows people with physical disabilities to type efficiently using their eyes. Users simply move their eyes to the letter or word they would like to type. This may help TFL members with communication. More generally, the Skyle Eye Tracker has a similar function and allows users to control iPads and iPhones using eye movements.



**VR Controllers:** Being relatively inexpensive, with these VR controllers gestures can control external environments. Unlike smart gloves, VR controllers are capable of controlling buttons and pads. While there is less freedom in the gestures compared to smart gloves, there is greater possibility of combining gestures with buttons to produce various tasks or pre-automated lists of tasks.

**Skin-like Facial Sensor:** A \$10 skin-like sensor attaches to the face of people with disabilities and enables them to communicate phrases using small facial movements. For example, a quick smile could be programmed to say "Thank you." Again, this is a personal assistive technology, however, effective communication can be used to increase independence.



# ASSISTIVE TECHNOLOGY: RESEARCH FINDINGS

## POTENTIAL ADDITIONS TO PRODUCT MIX

The following two products focus on personal assistive technology more generally.



**Y-Brush:** The Y-Brush is an innovative toothbrush which uses sonic vibrations to clean teeth in the matter of 10 seconds. While this is more of a personal assistive technology rather than environmental control, we believe it can be helpful for those with motor limitations to maintain their oral hygiene.

**Low Cost Options:** Although this is not a tangible product, several studies show the importance of affordable and accessible AT. Low cost options are incredibly important and TFL is tackling this with their Simon Cox Design Competition. We recommend that heavier marketing and focus be allocated to this program as our interviews with the team have revealed promising innovations stemming from this program.



## GENERAL RESEARCH THEMES

Throughout the 180DC team's research, there were some key themes that were prevalent. One of the biggest was the cost of assistive technology. Many of the new technologies on the market are new and innovative, leading to **costs being high** and **not feasible** for TFL. TFL also focuses mainly on environmental controls. However, the team's research mainly returned results focused on **personal assistive technology** options. Devices such as stabilized spoons, arm replacement devices, and much more were plentiful, with new environmental control technology being more limited. The assistive technology landscape is constantly changing, therefore, more environmental control technology is bound to be developing constantly.

Other research themes include the inspiring future of assistive technology in the **gaming industry**. With the gaming industry's technology rapidly developing, new devices found in this industry can be figured towards promoting independence. For example, devices like **VR Controllers and headsets** can be used to help with environmental and personal controls and help promote independence. Lastly, the team found that voice controls are very prevalent and are the current advancements in the assistive technology landscape. There are many other options on the market, however, they can be costly. Therefore, **DIY options** can also help reduce costs.

# FINAL RECOMMENDATIONS

## MISSION AND VISION STATEMENTS

- Words such as "**community**", "**independent**", "**home**", and "**people**" accurately reflect TFL's work as an organization
- There were some **inconsistencies** between the interview responses and the survey responses, which shows that individuals may not relate to certain words even if these words directly describes an organization's services
- When choosing between multiple words with similar meanings, the ones with **more positive connotations** would be more suitable for a mission and vision statement

## ASSISTIVE TECHNOLOGY RESEARCH

- TFL's product mix could benefit further with the addition of **environmental controls and other low-cost options**, since budget is a very important factor
- The 180DC team recommends four products that focus on personal assistive technology in the context of **communication**, and two products that focus on personal assistive technology **more generally**
- Many new products in the assistive technology market are **very innovative but beyond TFL's budget**, and new environmental control technology is **relatively limited**

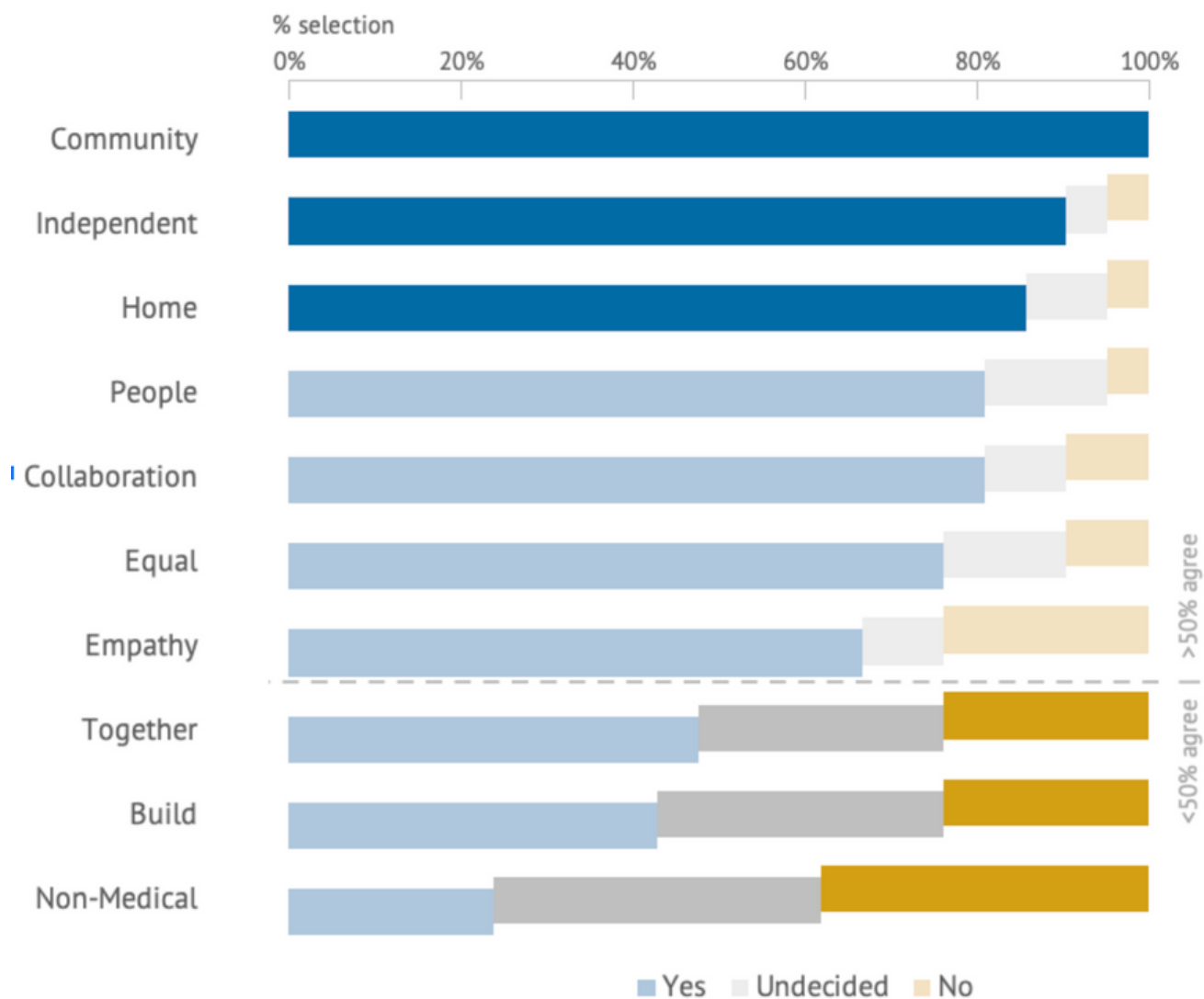


# PROJECT APPENDIX

	HELPFUL	HARMFUL
<b>INTERNAL</b>	<ul style="list-style-type: none"> <li>• Tech-focused, provides unique range of services and equipment</li> <li>• Community-based operations</li> <li>• Customers specify what they want, instead of medical model which may be inaccurate</li> <li>• Services and tech are mainly free of charge</li> <li>• Sustainable funding system</li> </ul>	<ul style="list-style-type: none"> <li>• Not big on awareness, many potential customers are unaware of TFL's services or even its existence</li> <li>• Convoluted and confusing mission and vision statements</li> <li>• Services are not concisely summarized, too many programs within programs within programs</li> </ul>
<b>EXTERNAL</b>	<ul style="list-style-type: none"> <li>• Educate the community about TFL's services (and also about disabilities in general)</li> <li>• Provide assistive technology to youth (ages 12-18)</li> <li>• Create a regular program to develop unique assistive technology (Simon Cox)</li> <li>• Enhance relationships with partners</li> </ul>	<ul style="list-style-type: none"> <li>• Changes in policies such as CRA's policies</li> <li>• Large changes in demographic may spread TFL's operations too thin</li> </ul>

# PROJECT APPENDIX

## TFL Keywords Survey Results



# PROJECT APPENDIX

## Other Keywords Collected from Respondents

1	<i>Accessibility</i>	<i>Equitable</i>	<i>Participate</i>
2	<i>Allies</i>	<i>Equity</i>	<i>Provincial</i>
3	<i>Autonomy</i>	<i>Helpful</i>	<i>Relationships</i>
4	<i>Development</i>	<i>Inclusion</i>	<i>Support/ Supportive</i>
5	<i>Engagement</i>	<i>Innovation</i>	<i>Technology</i>

## Keyword Comments

1	<i>Non Medical - I think this is true, but I like community more. Together - I liked collaboration more than together.</i>
2	<i>Empathy - I believe that we strive to demonstrate empathy, not sure if we achieve it though.</i>



# PROJECT APPENDIX

Core Value Candidates		Numbers of Selections			Total
		1st choice	2nd choice	3rd choice	
The right to live <i>independently</i> at <i>home</i> .	1	11	3	1	15
You have a right to <i>self-determination</i> .	2	1	6	3	10
All of our programs should be <i>accessible, equitable</i> and <i>fair</i> to <i>everyone</i> that it serves.	3	2	2	6	10
Empathy at all levels of the organization.	4	2	3	2	7
You have the capacity to learn and to develop the skills and knowledge to manage your own respiratory and assistive technology needs.	5	1	3	2	6
Social responsibility for those we serve.	6	1	1	3	5
You have the right to express your needs, to voice your concerns and articulate your goals in a climate of personal safety.	7	0	1	2	3
Human centered innovation.	8	1	0	2	3
Open collaboration for all.	9	1	1	0	2
People who use the Technology for Living Provincial Respiratory Outreach Program have a right to funding security in the provision of respiratory equipment and supplies.	10	1	1	0	2

Percentage Matrix				
1	52%	14%	5%	71%
2	5%	29%	14%	48%
3	10%	10%	29%	48%
4	10%	14%	10%	33%
5	5%	14%	10%	29%
6	5%	5%	14%	24%
7	0%	5%	10%	14%
8	5%	0%	10%	14%
9	5%	5%	0%	10%
10	5%	5%	0%	10%

# PROJECT APPENDIX

## Core Value Feedback

Core Value Candidates		1st Choice	Comments on the 1st Choice
1	Social responsibility for those we serve	2	All of TFL's programs should be an on-going collaboration between its employees and its members, in order to provide the best possible service.
2	Open collaboration for all	3	Living at home, living independently at home - these are both very important. This one jumps out as an immediate number one for me.
3	The right to live independently at home	3	This feels like the main tenet of our organization
4	Empathy at all levels of the organization	3	The value that hits closest to home for me is the idea of TFL assisting in fostering independence both at home and in the community.
5	Human centered innovation	3	There is currently no provincial mandated right for people with disabilities to live independently at home. This value engages TFL in the struggle to make this a right.
6	You have a right to self-determination	3	This is a central pillar of what TFL is...and it is a commitment that is unique to this organization
7	All of our programs should be accessible, equitable and fair to everyone that it serves	3	This covers most of the other stated core values from the perspective of the members
8	People who use the Technology for Living Provincial Respiratory Outreach Program have a right to funding security in the provision of respiratory equipment and supplies	3	This clarifies that TIL is far distant from a medical model. Emphasis is on living at home with appropriate support which is identified by the member and members of their select team
9	You have the right to express your needs, to voice your concerns and articulate your goals in a climate of personal safety	5	forward thinking, simple, clear
10	You have the capacity to learn and to develop the skills and knowledge to manage your own respiratory and assistive technology needs	6	We will support you in your goals. Remove any limitation caused by your residence or equipment.
		7	All of our programs ARE (not should be) accessible... OR something like "we strive to make our programs accessible...."
		10	Not accurate. Not every does or is capable willing

(cont'd in next page)

# PROJECT APPENDIX

## Core Value Feedback (cont'd)

2nd Choice	Comments on the 2nd Choice	3rd Choice	Comments on the 3rd Choice
2	I like empathy, it's more of a keyword in this statement - it could be flushed out more into a sentence but empathy from our staff is important.	1	I found this difficult to rate as there were words in one that could be used in another and words I would not use.
4	Empathy should be the foundation of all community work.	3	Everyone should be able to live independently at their home without anyone help and technology is the way how it could be achieved.
4	important for this to be fostered	4	Without empathy at all levels of the organization, we cannot support individuals living at home in their communities and being self determining in their care
4	This is what the organization value towards its member	5	This is what we should focus on
6	This supports #3	6	Members need to be able to choose what works best for them. They cannot have someone telling them that they know better than them. Members typically know what works best for them and their care.
6	and 10 goes with this one in my mind; you have the right and the ability to learn	6	#6, #3 and also to some extent #10 are pretty similar, and important.
6	This value is crucial to levelling the playing field for our members and counterbalancing the paternalism of the medical model	7	Similar to the idea of empathy
6	We are member driven, again this makes us unique as an organization and that much more valuable to the groups we support	7	It a pie and everyone gets slice. When it is imbalanced, the structure falls apart.
6	Actualization	7	All of our programs should be available to those whose disability needs are within the realm of possibility/provision of TIL. This is a provincial program. Geography, finances and access to major centres should not prohibit the ability to utilize resources of Tlk. With enough time and patience, there is almost always a way to make it work.
7	I agree that TFL's services should be easily accessible for those that it serves. Its services need to be easily found by members, OTs, RTs, Physician, etc. in order for TFL to grow and for its members to get the services that they require.	7	Respect, equity
8	We live in a rich country with abundant natural resources. An individual should not be prevented from making a decision to have at home when it is safe to do so because of inadequate financial resource	9	This aligns with TFLs history and current goals
9	in a climate of Autonomy (not neccessarilty safety as I feel that is a given.)	9	could be worded better, but it captures the spirit of "members owning their independence in a safe and supportive environment"
10	This is a broad term and it's unclear what this actually capture or supports	10	Focuses on our members' abilities rather than their disabilities
10	Directing your own care or be involved in some capacity.	10	Not a fan of this statement as it reads as eliminating the collaboration with Drs/RTs/biomedes which play a very key role in respiratory and tech needs and for our members to use these devices safely.

# PROJECT APPENDIX

Numbers of Selections; total 21 respondents

Vision Statement Candidates		1st choice	2nd choice	Total
1	To maximize <i>independence</i> and <i>autonomy</i> at home through the use of <i>technology</i> and respiratory therapy for people with physical disabilities.	11	4	15
2	To support independent living at home through innovation, collaboration, and support.	4	5	9
3	We believe that everyone has equal opportunity to maximize their independence.	4	2	6
4	Through collaboration, we develop and provide member centred technological solutions and supports to optimize independence.	0	5	5
5	To provide support for our community through innovation and technology that assists independent living.	1	3	4
6	To support independence and autonomy at home for all.	0	1	1
7	To build a community that supports our membership to live independently at home.	1	1	2

Percentage Matrix

1	52%	19%	71%
2	19%	24%	43%
3	19%	10%	29%
4	0%	24%	24%
5	5%	14%	19%
6	0%	5%	5%
7	5%	5%	10%

# PROJECT APPENDIX

## Vision Statement Feedback

Vision Statement Candidates		1st Choice	Comments on the 1st Choice	2nd Choice	Comments on the 2nd Choice
1	To build a community that supports our membership to live independently at home.	1	For sure, number 1 is consistent with our vision of supporting people to live independently in the community with appropriate, self identified supports	2	It may be a bit wordy, but ultimately it get the point across.
2	To maximize independence and autonomy at home through the use of technology and respiratory therapy for people with physical disabilities.	2	I like that it has respiratory therapy (PROP) and technology (TIL) - I think this is what we all want.	2	TFL having PROP represented in the vision is nice
3	To support independence and autonomy at home for all.	2	This is the most specific to TFL	2	Maximize is good
4	To support independent living at home through innovation, collaboration, and support.	2	Disability should not be a barrier to enjoy life.	3	visionary, big goal--maybe a bit too simple?
5	To provide support for our community through innovation and technology that assists independent living.	2	That's what we do and it's said in a simple way. Also the statement is achievable and realistic	4	Less specific but also good
6	We believe that everyone has equal opportunity to maximize their independence.	2	It describes who and what we provide...technology and therapy	4	Il suggest modifying this to "To maximize independence living and autonomy at homes through innovation, collaboration, and support.
7	Through collaboration, we develop and provide member centred technological solutions and supports to optimize independence.	2	like the phrase maximize independence and autonomy	4	This statement is more all-inclusive and can include all people with disabilities, not just those who are respirator dependent.I hike the words innovation and collaboration
		4	It is short and to the point.	5	3. To support independence and autonomy at home for all.- instead of "for all" I might say something like "To support independence and autonomy for the community we serve"
		4	It includes independent living at home, which is very important to distinguish, but also includes support, which is lacking a little in the other options...but is the biggest part of what we provide.	5	. I also liked #5 - I had a hard time choosing between them. Maybe 5 is better stated than 3 now I review it. (I changed my pick from #3 to 5!)
		4	captures what we do	5	Similar to first choice example
		4	Tossup with 2	6	Everyone should have equal rights.
		5	To provide support for our community through innovation and technology that assists independent living. - this encompasses without being exclusive or too detailed. I would rather see: To provide support for our MEMBERS through innovation and technology that assists in independent living and promotes autonomy.	7	I don't think that any of the other options are visions, they are missions as is this statement
		6	I think home and community should both be represented in the vision and this achieves that ... by being vague I guess	7	Through collaboration, we develop and provide member centred technological solutions and supports to optimize independence. This is all encompassing as well...but would add autonomy in there as well.
		6	It is a succinct and inclusive vision statement		

# PROJECT APPENDIX

Numbers of Selections; total 21 respondents

Mission Statement Candidates		1st choice	2nd choice	Total
1	To promote <i>independence at home</i> through <i>assistive technology</i> , respiratory therapy and peer support.	14	3	17
2	To maximize independence at home by providing innovative technology and respiratory therapy.	2	7	9
3	To support independence at home for people with physical disabilities	3	4	7
4	To offer customized solutions supporting members independence at home	1	5	6
5	To support independence/autonomy at home.	1	2	3

Percentage Matrix

1	67%	14%	81%
2	10%	33%	43%
3	14%	19%	33%
4	5%	24%	29%
5	5%	10%	14%



# PROJECT APPENDIX

## Mission Statement Feedback

Mission Statement Candidates		1st Choice	Comments on the 1st Choice	2nd Choice	Comments on the 2nd Choice
1	To support independence/autonomy at home.	1	Independence and autonomy at home. This statement emphasizes distance from the medical model and potential placement in a facility.	1	Cleanest representation of the core idea
2	To offer customized solutions supporting members independence at home	2	should be members'. captures everything.	2	I especially like "customized solutions" . We do provide customized solutions, our solutions are as varied as abilities of our members. Sometimes people have degeneration of their muscles, and we have to provide different solutions as they disease or disability progresses.
3	To support independence at home for people with physical disabilities	3	This defines our services and scope.	2	To offer customized solutions supporting members independence at home (instead of 'supporting' I would use 'fostering'. typo: members' (need apostrophe, I think)
4	To maximize independence at home by providing innovative technology and respiratory therapy.	4	Simple, archivable	2	Condensed version
5	To promote independence at home through assistive technology, respiratory therapy and peer support.	4	Focuses on what we do	3	The closest to first choice
		5	I think it covers all the bases of what TFL does.	3	I suggest to change to "To support independence/antomnomy at home for people with physical disabilities"
		5	I think this includes our purpose and how we fulfill the purpose, it includes PROP, TIL and Peer Support .	4	Pretty much the same as #5 but missing the peer support.
		5	Most specific to TFL	4	Also good, less specific.
		5	All 3 assistive technology, respiratory therapy and peer support represented	4	This is an all-inclusive statement that encompasses physical disabilities and those with the need for inspiratory technology and support
		5	I would add for people with disabilities to the end of %	5	We should be able to use technology to help people who needs it to achieve they independence.
		5	no additions/comments	5	I would prefer maximize independence. I would add peer support to #4 to improve it as a mission
		5	Seems to fit	5	more granular