

# Dynamic Tactile Device Request for Information



AMERICAN  
PRINTING  
HOUSE

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1839 Frankfort Avenue, Louisville, KY 40206



# Dynamic Tactile Device Request for Information

This Request for Information (RFI) is to help the American Printing House (APH) seek a potential business partner to provide a tactile graphics display to be sold by APH that meets the unique teaching and learning needs of our target customers. APH will consider all information for existing, modified, or new devices, with the goal of making an affordable, effective, quality dynamic tactile graphics display for school and general use available to our customers before or no later than the fall of 2022.

Due to the scope of such an innovative endeavor, APH is looking for a business partner along with a technology partner to share in the finance, development, manufacturing, and global distribution responsibilities of this product. Development of an international tactile graphics electronic tool has never been done before, and bringing one to market, along with adherence to and potential modifications of tactile textbooks standards, will require a collaboration of effort on the part of many global organizations. APH is looking for a partner with which to pioneer these alliances.

**Please note that this RFI also does not guarantee that a contract award or business partnership will be made.** This is a request for information only and not a formal request for quotation. Responses will not be published publically and are used for the soul purpose of market, cost, and potential partner research by APH. **All responses are considered to be under a non-disclosure agreement with APH.**

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# BACKGROUND

## American Printing House for the Blind (APH) Overview

The American Printing House for the Blind (APH) is a private, nonprofit 501(c)(3) corporation that has served our nation's citizens who are blind and visually impaired since before the Civil War. Founded in 1858, APH is the oldest company in the U.S. dedicated to creating products for people who are blind or visually impaired and is the largest organization of its kind in the world. APH has a wide range of products and services such as educational materials including tactile graphics, software, braille, large print, digital textbooks, and accessible tests. In addition, APH is viewed as an important source of information and a thought leader throughout the industry.

The mission of the American Printing House for the Blind is to empower people who are blind or visually impaired by providing accessible and innovative products, materials, and services for lifelong success. Much of APH's mandate is derived from the Federal Act to Promote the Education of the Blind of 1879. The Act provides an annual federal appropriation that funds the development of educational products and distributes funds to schools throughout the U.S. for the purchase, distribution, and training of these products. Through the Act, we work to level the learning playing field by providing technology and products that open the doors to educational success, satisfying employment, social inclusion, active citizenship, and personal well-being.

APH has recently expanded its mission to support children and adults across the lifespan, and has developed international partnerships for the distribution of its products and information globally.

Learn more about APH at [www.aph.org](http://www.aph.org).

## Our Audience

APH has a very wide range of audiences for our products, services, and information. This includes students of all ages, service providers, professionals, consumers and family members, organizations needing/supplying services, providers, professionals, universities, government agencies, employees, and the general public.

A majority of the products and services we provide are educational and intended for primary and secondary students and their teachers. We also provide products, services, and information for independent living. We produce hundreds of products each year. Tactile graphics are but one of these products, yet are integral to our business and our customers.

One of APH's strategic goals is to provide products and services globally. This tactile device will have high impact both within the United States and internationally. We consider an international market integral to the financial success of this product in order to achieve necessary market scale.

## APH: A World Leader in Tactile Graphics and Braille Production

The following numbers represent orders, production, and registrations for braille and tactile graphic products and services for APH, fiscal year 2019:

- 312,530 embossed tactile graphics produced
- 235 new braille textbooks (73 STEM)
- 1,206,019 embossed textbook pages
- 1,518,549 hard-copy braille textbook pages
- Tactile Graphic Image Library (TGIL) – 9,562 registered users
  - o Over 1600 images
  - o Users registered in 83 countries and territories
- Tests – 628 unique accessible tests produced

Tactile graphics are essential for representing abstract and concrete graphical material for inclusion in electronically distributed braille textbooks, standardized testing, and online study materials, as well as general internet information.

APH has a long history of providing high-quality tactile graphics and continues to develop and innovate new options for producing and creating tactile graphics using low- and high-tech tools and devices. As a leader in the production of braille textbooks, accessible tests, and tactile graphics, it is critical that APH stay on the cutting edge of new ways to make tactile information available on demand and easy to access, as well as tactile displays that are motivating and understandable for students.

It is important to distinguish between embossed graphics that APH produces in-house and the large amount of digital tactile graphics that are created by APH and provided for self-embossing by the end user. APH's Tactile Graphic Image Library (TGIL) contains hundreds of expert-designed templates to aid with the creation of tactile graphics covering numerous subjects, including science and math. TGIL graphics meet the guidelines outlined in the Braille Association of North America (BANA) Tactile Graphic Guidelines at [www.brailleauthority.org/tg/](http://www.brailleauthority.org/tg/). New graphics are added regularly to the TGIL, and anyone can sign up for a free account.

A learner who is blind or low vision cannot simply touch a tactile graphic created from Google Images and understand what they are touching. Effective tactile graphics require significant filtering, greatly reducing the amount of detail, at times resulting in a tactile graphic that is only the outline of the print version of that image. Currently this is an extremely manual task. A parallel project to the dynamic tactile device will be the development of simple-to-use software that can reduce the manual effort of filtering tactile graphics. An ideal partner would possess such software expertise.

## Five Years of Work on the Graphiti

APH had the incredible opportunity to perform some unique research of dynamic tactile graphics technology over the past five years. The Graphiti tablet device was the first of its kind to provide semi-real-time graphics for users who are blind or low vision. Along with its internal storage capability of graphics files and HDMI and USB connectivity, the Graphiti was able to provide a tactile representation of those graphics on the device using pins of varying heights.

Through five years of field testing the Graphiti, APH learned significant lessons about how tactile learners receive information from a dynamic tactile device, such as how much detail is too much detail, where software is necessary to intercept the graphic before it reaches the fingertips of the user, and the optimal refresh rate.

Additionally, APH determined the best size and weight for students to be able to carry a tactile graphic display from class to class, as well as any future needs with regard to both tactile and braille textbook requirements.

APH has several ongoing research projects progressing simultaneously, some of which never make it into the hands of a user; this was the case for the Graphiti project. However, the information learned from such research has been invaluable and will be extremely beneficial as this next phase of the dynamic tactile device endeavor progresses.

APH TOUCHES THE SUN — People who are blind experience the solar eclipse:

<https://www.youtube.com/watch?v=lfH3gSpcHlw>

Graphiti Advanced Graphics Demonstration: <https://youtu.be/-o9Gq2UvMqY>

## Why Dynamic Tactile Displays?

Dynamic tactile displays provide exploration, creation, and discussion of graphical information **in the moment**. This is crucial for students who are blind and visually impaired as it levels the learning playing field for these students. To wait for access to the same graphical information typically encountered/perceived instantly by sighted peers places the student with visual impairments at a disadvantage.

Educational content is heavily dependent on graphical information. Traditional subject matter, like maps, charts, and graphs remain essential to learning. STEM subjects are especially difficult to absorb as much of the material is reliant on graphic and formulaic information. While thousands of specially prepared tactile graphics currently exist, access to the ever changing and growing world of graphics is imperative for an equal education for all students. Access to information about commonplace materials and concepts such as logos, icons, and color representation fundamentally changes the way we think about these subject matters.

## Primary Market for a Dynamic Tactile Device

*U.S. Education Market: Teachers of students with visual impairments (TVIs), students of all ages, Orientation and Mobility (O&M) Specialists, Assistive Technology teachers, Ex Officio Trustees, Instructional Material Centers, Career/Vocational instructors, Occupational Therapists, standardized testing companies and braille textbook publishers*

In 2017, APH served 63,357 students in the United States with some level of visual impairment who were eligible for federal quota funds. These students ranged from ages 6 to 21 and had varying levels of visual impairment and reading methods.

- Braille readers: 4,963 (7.8%)
- Print readers: 20,460 (32.3%)
- Auditory readers: 6,833 (10.8%)
- Non-readers/symbolic readers: 20,718 (32.7%)
- Pre-readers: 10,383 (16.4%)

[Source: American Printing House for the Blind, “Annual Report 2017: Distribution of Eligible Students Based on the Federal Quota Census of January 4, 2016 (Fiscal Year 2017).” Retrieved from <https://nyc3.digitaloceanspaces.com/aph/app/uploads/2019/03/26161123/APH-Annual-Report-FY17.pdf>]

An annual registration of eligible students determines a per capita amount of money designated for the purchase of educational materials produced by the American Printing House for the Blind (APH). These funds are credited to Federal Quota accounts, which are maintained and administered by APH and its Ex Officio Trustees (EOTs) throughout the country. There are 137 EOTs servicing all 50 states, the District of Columbia, Guam, Puerto Rico, and the U.S. Virgin Islands.

We foresee the primary users of the dynamic tactile device to be students with visual impairments, TVIs, and O&M Specialists who may be teaching in schools for the blind or in public school settings, and have varying degrees of experience with tactile graphics—beginner to advanced. This tactile device may be the first one they have ever had personal access to in their classroom or school. It may be used for tactile graphics-on-demand needs, such as for classroom assignments, classroom instruction, standardized testing, or for other information needed to level the learning playing field for their students. Students may use it to demonstrate understanding of taught concepts, complete in-class and homework assignments, and so on. It is expected to have heavy use in the classroom environment.

In addition to the classroom environment, the COVID-19 pandemic has revealed significant weaknesses in virtual instruction for those who are blind or low vision. During this virtual experience, students have been without tactile graphical representation the entire time they have been learning from home unless embossed graphics have been delivered to them, a new phenomenon that has become known as “porch braille.” These absences, delays, and inconveniences ultimately limit their ability to comprehend concepts and put them at a disadvantage compared to their sighted classmates.

Yet, in addition to tactile graphics, simply receiving braille material in a timely fashion prior to or during the pandemic has been a challenge. Classroom teachers often don’t have time or forget to provide braille transcribers the material ahead of time, and being remote exacerbates this challenge.

As a result, blind students frequently resort to exclusively listening to a screen reader read the content, which can be detrimental when working with STEM or literary/spelling concepts. A screen reader alone does not provide a student who is learning early literacy skills access to punctuation, spelling, formatting, and layout information. A similar sighted student who is reading content visually, receives this information immediately. If these students possessed a tactile device that could either receive or instantly view tactile content using software filters, they would be able to consume content on demand.

## **Secondary Market for a Dynamic Tactile Device**

*International Education Market: Primary and secondary education, Teachers of students with visual impairment (TVIs), students of all ages, Orientation and Mobility (O&M) Specialists, Assistive Technology teachers, Career/Vocational instructors, Occupational Therapists*

According to the most current information from the World Health Organization, an estimated 19 million children globally (including developed and non-developed countries) are vision impaired. Around 1.4 million have irreversible blindness, requiring access to vision rehabilitation services to optimize functioning and reduce disability.

[Source: [FACTSHEETS Vision impairment and blindness](#) - Updated October 2017, WHO]

We anticipate that this product will be sold internationally to the same or similar market as the U.S. Quota market, with the goal of providing every student with a visual impairment access to tactile content. Localization/Internationalization will be necessary to support multiple languages. In addition, global textbook and tactile graphics digital file standards will need to be adjusted to support a dynamic tactile device of this nature. Partnerships with global organizations for the blind that are not already established will need to be created to support such an endeavor. Examples of such potential partner organizations include the World Blind Union (WBU), International Council on English Braille (ICEB), Braille Authority of North America (BANA), Royal National Institute of Blind People (RNIB), Canadian National Institute for the Blind (CNIB), National Federation for the Blind (NFB), American Council for the Blind (ACB), and others.



## Tertiary Market for a Dynamic Tactile Device

*Global Access Market: Any country or province that is seeking access for public businesses, services, and universities—University-level disability offices supporting college students who are blind, government agencies for blind rehabilitation and transition, transportation hubs (e.g., airports, trains, buses, etc.), other organizations and businesses with tactile graphics-on-demand needs*

Blindness and vision impairment affect at least 2.2 billion people around the world. The combination of a growing and aging population will significantly increase the total number of people with eye conditions and vision impairment, since prevalence increases as people age.

[Source: World Health Organization, October 8, 2019, “World report on vision.” Retrieved from <https://www.who.int/publications-detail/world-report-on-vision>]

Tertiary users include college students with visual impairments and college disability offices providing a dynamic tactile display to assist students with their classwork, studying, wayfinding, or social and leisure activities. Students will typically use the tactile displays independently, and may or may not receive assistance from disability office representatives.

Another tertiary market will be state/province and local agencies that provide rehabilitation services for all individuals with vision impairment and transition services for students going into college or a career.

Additionally, transportation agencies will benefit from tactile graphics-on-demand for routing information or directions to platforms, gates, shops, restaurants, facilities, and so on.

Last, APH has received feedback from small businesses, churches, print shops, parents, and others in search of dynamic tactile displays. They have been looking to APH to provide this product. These customers have no experience working with a dynamic tactile display and expect it to behave in an intuitive manner to support compliance with ADA and other national disability regulations and provide an accessible and inclusive space for their patrons. Examples include, but are not limited to:

- Museums
- Arboretums
- Parks (city, state, and national)
- Libraries (public and private)
- Art galleries
- Historical sites
- Shopping Malls, Sports/Event arenas

We anticipate that global disability laws will expand to include this type of device in all public businesses, services, and schools within a matter of years.

## Technology and Hardware Considerations

An interactive tactile graphic device can allow students to “dig deeper” for more information by possibly zooming in on a specific location of a graphic, shifting the graphic side-to-side if it cannot be captured fully/comfortably within a confined area/page size, allowing students to be the creators of their own graphics/drawings using a dynamic device, and so on. Therefore, a smooth and instant response to commands and logical manipulation of user interface elements based on user experience feedback are crucial.

Portability and durability are key hardware concerns, as it is reasonable to assume that the dynamic tactile graphic device would be moved from place to place as needed.

This product will need to be able to be manufactured at scale to keep costs down for the end user, as well as affordable to repair by individual users, schools, or organizations.

## Training Considerations

Training for traditional tactile literacy combined with the device commands to manipulate images is both necessary and important. Tactile literacy encompasses many skills such as, but not limited to:

- systematically scanning a graphic on a page
- identifying the most important features within a graphic
- navigating raised lines/point symbols/real patterns
- understanding perspective
- transitioning from 3-D models/objects to 2-D representations
- becoming familiar and versed with all types of tactile media

Tactile literacy is not instantaneous, but begins before formal classroom experiences and requires exposure to repeated opportunities to decipher/interpret tactile displays of all kinds.

Training on common device gestures such as zooming, panning, scrolling, pinching, rotating, and so on in relation to a dynamic tactile graphic display will also be necessary. These concepts are not common for most individuals with vision impairment. Training on how to use these gestures in conjunction with a dynamic tactile graphic display will expedite learning and usage of the device, as well as introduce device gesture concepts that could be applied universally.

However, training is not limited to the blind or low vision user. A significant amount of training for teachers, trainers, employees, and so on will need to be made available as well for adoption of a device of this caliber to occur.

# Assumptions

- 1) It is expected that to achieve the requirements set below, a new tactile technology will need to be created/used.
- 2) *If* this investigation results in a Request for Quotation, (RFQ), which is not a guarantee, it is possible that in addition to a hardware RFQ, an additional software RFQ could become available.

# Objective

The responses to this request for information (RFI) will be used to:

- 1) Inform APH of the potential partners who possess technology that could be used to manufacture a dynamic tactile graphics device within the next 2-3 years.
- 2) More accurately estimate the cost of manufacturing such a device, resulting in a more accurate estimate of the cost to the end user.
- 3) Identify missing or unclear use cases for such a device.
- 4) Gain an understanding of the effect of such a device on tactile graphics standards and file formats.
- 5) Provide insight into existing research into users interacting with dynamic tactile graphics.

# Scope

Respondents are requested to provide information regarding the feasibility of developing a dynamic tactile device capable of the requirements listed in the Requirements section. APH has identified two possible scenarios as defined below.

- 1) An existing product either commercially available or nearing production by the respondent and modified per the requirements and sample use cases provided in this document, in partnership with APH. Cost and IP sharing to be determined upon partner selection.
- 2) A collaborative technology development project between APH and the respondent. Cost and IP sharing to be determined upon partner selection.

# Partnership

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## I. Business Profile

APH is searching for a partner who is interested in both a technology and business collaboration. Due to initial low volumes during research/testing phases, it is understood that the ramp-up cost of this project will be high.

- A. Ideally, partners will have experience with producing refreshable braille, tactile graphics, or touch-based representation of content.
- B. Partners interested in collaborating on a dynamic tactile graphics device project will have the capability and commitment in cost/IP sharing with APH.
- C. Partners will have an international presence and distribution network that will benefit this project.

## II. Manufacturing Capabilities

- A. Partners will have manufacturing and production experience of 5,000-10,000 units of high-tech products a year.
- B. Ideally, partners will have experience with producing refreshable braille, tactile graphics, or touch-based representation of content.

## III. UX Research and Design

- A. Ideally partners will have software/UX teams who have performed user testing and identified user challenges in regards to tactile understanding.
- B. Partners should have a history of producing user experiences for people who are blind or low vision.

## IV. After Care

- A. Ideally partners will have technical support and repairs departments that can support the markets identified in this RFI.

## V. Distribution

- A. Ideally, partners should have a distribution network that is in all major international markets.

## VI. Training

- A. Ideally partners will have training experts or agree to join APH on training endeavors to ensure the public has a clear understanding of how to utilize this innovative tech.

## VII. Partnership Contribution

(money, IP, staff time, other resources, expected investment, expected return)

- A. As mentioned previously, in addition to seeking a technology partner, APH is looking for a business partner who will be interested in both cost and IP sharing to ensure users receive access to tactile information optimally and at the lowest possible expense.
- B. Cost of the development and returns of this tech will be shared. The goal of this project is to provide such a device at the lowest cost to the end user as possible.

## VIII. What an APH partnership provides:

- A. **Credibility:** APH is the world's largest nonprofit organization creating accessible education, workplace, and independent living products and services for people who are blind and visually impaired. APH has also been recognized by outside entities for our outstanding work, twice winning the FCC Chairman's Awards for Advancement of Accessibility.
- B. **Experience/Expertise:** We have over 160 years of experience in the field of blindness. Many of our staff members have worked as educators or administrators for students with vision impairment and/or have been in this business for several years. You will have access to:
  - 1. APH project leaders with specialized knowledge in particular areas, such as tactile graphics, orientation and mobility, and multiple disabilities, to name a few
  - 2. APH technology, accessibility, and UX experts
  - 3. Experts and leaders in the creation of tactile graphics and braille standards
- C. **APH financial contributions**
  - 4. U.S. distribution network through federal quota system
  - 5. Investment of funds for development, outreach, training
- D. **Support and training expertise**
  - 6. Grant writing support
  - 7. Marketing and outreach support
  - 8. User testing, field testing
- E. **Tactile Graphics Image Library (TGIL):** The TGIL contains hundreds of expert-designed tactile graphic templates that meet the standards outlined in the BANA Tactile Graphic Guidelines at [www.brailleauthority.org/tg/](http://www.brailleauthority.org/tg/). These templates would be available to you for development and testing purposes.
- F. **Networks/Connections**
  - 9. Global TVI and NGO partner network
  - 10. APH Braille textbooks and tests network
- G. **Development**
  - 11. Grant writing experts
  - 12. Donor network
  - 13. U.S. and international partnership development
  - 14. Training and curriculum development

## Technology Sample Use Cases

Please note that these use cases are based on an ideal vision of a dynamic tactile graphic display. We recognize that all the features presented may not be incorporated in the first version. Yet, these are problems we want to solve and would like the device to evolve in this direction. We are open to new ideas and approaches to solving these problems and more.

**Scenario 1:** A second-grade student who is blind is working at a single standard-size desk in a classroom with sighted peers. The teacher is displaying and discussing a graphic image on a whiteboard with student participation. This student attends a public elementary school and changes classrooms a couple of times a day.

Possible student-device actions:

- 1) At the same time as the image is displayed on the whiteboard, the student receives—on a physical storage device via a wireless method or through a video connection such as an HDMI cable—a tactile image from the teacher that is displayed instantly on the dynamic tactile graphic device.
- 2) The student can touch the surface of the tactile device and understand the image, diagram, or shape presented to them, and thus, is able to participate in the classroom discussion.
- 3) The student could utilize audio to provide additional contextual information, if the file format contains it.  
For example, the student could press on or do a double-tap gesture on a graphic of a cow and a moo sound effect would play.
- 4) The student takes the device to multiple classrooms during the day without needing to recharge it or plug it in.
- 5) The student (as young as 7 years old) carries the tactile device in a standard size child's backpack from class to class.

**Scenario 2:** A traveler with a visual impairment is attempting to find their gate at an airport (or platform at a train station).

Possible traveler-device actions:

- 1) A map of the airport (train station) is sent to the dynamic tactile graphic display from the traveler's smart phone via the airport (train station) website.
- 2) If the image is larger than the dimensions of the device, the traveler can use gestures to scroll or zoom in/out to see different parts of the graphic.
- 3) When scrolling/zooming a graphic, the transition represented to the user is smooth. For example, if pins are refreshing, the refresh time to regenerate an image does not affect the scrolling or zooming transition, and does not disrupt the consumption of the content for the traveler.

**Scenario 3:** A high school student with a visual impairment is taking a standardized online test. The test question includes geographical information contained in a map of the United States.

Possible student-device actions:

- 1) The graphic is delivered to the dynamic tactile graphic device instantly via the selection of a link or click of a button from the standardized online test.
- 2) While the student explores the graphic, they notice differing sections of the image based on means/levels of shading presented in various ways and granularities to the student.  
For example, if the student is looking at a map, they are able to identify the location of oceans, lakes, landmasses, mountain ranges, and so on because of the differing means/levels of shading provided by the dynamic tactile graphic device.
- 3) While the student is exploring this graphic, they come across various braille labels that explain what they are reviewing. More braille labels may become visible or may disappear depending on the zoom level.  
**Note:** The braille has to be high quality and easy to read for labeling purposes. The primary objective of this device is to render graphics; however, providing high-quality braille with graphics on a dynamic tactile graphics device is an incredible benefit and one APH intends to strive toward.
- 4) The student is able to perform all operations without the use of sight.

**Scenario 4:** A teacher of students with visual impairments (TVI) is explaining a geometry concept while using the whiteboard, and has given the class a problem to solve about angles. The class is also given a new chapter to read and a homework assignment to be turned in by the following day.

Possible student-device actions:

- 1) The student is able to provide an answer by drawing with their finger directly on the dynamic tactile graphic display.
- 2) The answer is displayed on the whiteboard via wireless transmission.
- 3) The student can save the graphic internally or via USB flash drive to be delivered to the teacher via email for grading.
- 4) The student or the TVI could perform feature updates to the tactile device wirelessly and via a storage media if necessary.
- 5) The student can change settings for various needs. For example, a text-to-speech voice could be used along with refreshable braille on the tactile surface to render settings menus, file names, and so on. While scrolling through menus, the various items/settings would be shown as highlighted or selected via tactile representation.

**Additional Scenarios:** Students/users with low vision, multiple disabilities

Possible student-device actions:

- 1) If the student/user has any usable vision, the graphic could also be seen in varying color contrasts.
- 2) If the student/user has multiple disabilities, or the use of only one hand, the device and its gestures would be usable and manipulated via adaptive equipment and AI.

## Sample Graphics Set

APH has provided a set of sample graphics that we feel are the minimum level of graphical representation to inform respondents of the device expectations. Provided is a link to a zip file of sample graphics: <https://aph.sharefile.com/d-s8b0f5a7969348b28>.

## Responses

### Questions and Proposals

Questions may be submitted to Greg Stilson at [gstilson@aph.org](mailto:gstilson@aph.org) and Chris Prentice at [cprentice@aph.org](mailto:cprentice@aph.org). Questions and answers will be made public at [aph.org](http://aph.org). Clarification questions by respondents will be posted anonymously on [aph.org](http://aph.org). **All clarification questions must be submitted by June 15, 2020.**

APH is not looking for lengthy responses; however, details into how a respondent would accomplish a goal are appreciated. **Written proposals must be submitted by the close of business on July 13, 2020.** No other written proposals will be accepted after this date.

Submit your informational proposal to both: Greg Stilson at [gstilson@aph.org](mailto:gstilson@aph.org) and Chris Prentice at [cprentice@aph.org](mailto:cprentice@aph.org).

### Presentations

At the conclusion of the RFI written proposal submission, selected respondents, at the sole discretion of APH, will be given the opportunity to present any additional information they feel would be beneficial in providing more detail to their responses via a presentation. These presentations will most likely be done virtually.

In addition to any virtual presentations, respondents will have the opportunity to present/demonstrate any technology that would complement their response to this RFI. Due to the global pandemic occurring at the time of this RFI, arrangements may need to be made to ship APH staff any technology for a virtual demo. This technology must arrive in time for the presentation.

The presentation and technical demo process may be re-evaluated given state and federal COVID-19 safety and travel guidelines at that time, and respondent preference for virtual, in-person presentations or a combination of both. We will work to give respondents the opportunity to demonstrate their proposal using their preferred presentation style in the safest way possible for all participants.

At the conclusion of the presentation process, APH will provide feedback to the respondents on their presentations and technology. If there is mutual interest in pursuing a potential business partnership, those possibilities and next steps will be discussed at this time.



## Estimated Timeline

June 1	RFI issued
June 15	Respondent questions due to APH (Greg Stilson and Chris Prentice)
June 29	Answers to questions sent to respondents and posted on APH website
July 13	Written informational proposal due to APH (Greg Stilson and Chris Prentice)
August 3-14	Vendor and technology presentations/demonstrations
September 4	Response from APH

**Any business partnerships which may result from this RFI or an eventual request for quotation, are subject to negotiation and legal review.**

APH looks forward to the opportunity to partner on this incredibly innovative endeavor. Answers to the questions below are appreciated, and APH thanks you for your time and efforts in responding to this RFI. Any responses are not legally binding.

### Part A: Tactile Product Development Stage

- 1) Does your organization have a tactile product either in production or about to enter production that could meet many of the requirements or use cases listed in this RFI? **(If no, please proceed to Part B. If yes, answer Part A only.)**
- 2) What would be the anticipated unit price of such a tactile product produced according to the annual volumes listed as follows? (This is not a formal quote and will only be used for market research and planning purposes.)

Annual QTY	Unit Price
250–500	_____
501–1,000	_____
1,001–2,500	_____
2,501–5,000	_____

- 3) Please provide a progress report of the tactile product in development/production. What is the expected time to market? Where is the product in the development/production cycle?
- 4) Has your organization performed any tactile graphics user testing with students or adults with visual impairments? If so, how much and how did the results impact your technology research or development?
- 5) Upon review of the existing product concept, APH could suggest hardware or software changes. Based on your current development/production progress, how much would hardware and software changes affect your time to market at this point? Please provide answers for both hardware and software changes.

- 6) Please describe the cost/IP sharing collaboration that you would be interested in sharing with APH to create a tactile device product initially targeted at the education market.
- 7) Please provide your best example of a product or project that demonstrates your ability to take on and complete a project of this magnitude.
- 8) What, if any, additional information beyond that supplied in the sample graphics package and the available use cases would you need to improve your estimations or interest in such a product partnership?

## Part B: Tactile Technology Development Collaboration

**Note:** Please answer the following questions if you responded “No” to question 1 in Part A.

- 1) What dynamic tactile technology has your organization been developing? What makes this technology unique?
- 2) How developed is this technology?
  - a. Has it been tested by blind or low vision users?
  - b. Has it been tested by teachers of the visually impaired?
  - c. Do you have prototypes?
  - d. Have you attempted any level of manufacturing?
  - e. If no, what is your expected cost to manufacture this technology?
  - f. What is your expected lead time to enter manufacturing?
- 3) What is your budget for production, assuming such technology can be developed into a viable product?
- 4) Please describe the cost/IP sharing collaboration with APH that you would propose to develop a tactile device initially for the education market? What cost would you expect APH to assume?
- 5) What would be the anticipated unit price of such a dynamic tactile device that achieves the above requirements and use cases, assuming your organization’s tactile technology is the foundation of the product, if produced at the annual volumes listed. (This is not a formal quote and will only be used for market research and planning purposes.)


<b>Annual QTY</b>	<b>Unit Price</b>
250–500	_____
501–1,000	_____
1,001–2,500	_____
2,501–5,000	_____

- 6) What, if any, additional information beyond that supplied as part of this RFI is required for planning/estimating this effort?
- 7) Please provide your best example of a product that demonstrates your developing, user testing, and manufacturing capabilities; one that demonstrates your ability to take on and complete a project of this magnitude.

## **Additional Information**

Feel free to provide any additional information, thoughts, or suggestions that you feel APH should consider for the development of a successful project, product, and partnership.

Submit your informational proposal to both: Greg Stilson at [gstilson@aph.org](mailto:gstilson@aph.org) and Chris Prentice at [cprentice@aph.org](mailto:cprentice@aph.org) by July 13, 2020.



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