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EE538
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Town of Dennis: Sustainable Dennis Community App

About the Project

Beginning my senior year, I enrolled in EE538: Research for Environmental Agencies and Organizations, where students can pick from given or create their own research opportunities and projects related to fields in environmental and public health studies. The town of Dennis' (ToD) need for a community app was a project presented to the class. This project was presented by Julie Kennie, a local resident and member of the towns Climate & Coastal Resilience Committee. Wanting help in designing this app, Julie got in contact with my professor and then myself to make plans as to what the app could look like and do. I had worked with the Cambridge Massachusetts Department of Public Works (DPW) over the summer as a part of their *Water by Bike* internship and realized that the app being used by the DPW had more potential. The internship required the use of an app called, *Cartegraph One*. The app was used only by the DPW and had small circles sorted by color indicating the location of city owned trees I needed to water. When hearing about the town of Dennis' need for a community app I jumped at the idea, envisioning an app similar to *Cartegraph One* mapping Dennis and making icons for environmental activities and recycling bins. While the project started as this basic idea of mapping recycling bins and water refill stations, Julie Kennie and I worked to find what additional features could be added and how our app can best help the community. The Sustainable Dennis Community App seeks to provide a simple map of Dennis

with student-designed icons and selectable filters to help citizens and visitors sustainably enjoy the attractions in Dennis.

Understanding Dennis while Helping Julie Kennie

Julie explained that while mattresses are made of materials which are roughly 75% recyclable, they can only be recycled when disassembled. This is a major challenge as mattresses are not disassembled before reaching the ToD DPW, and if mattresses are incinerated, they create a residue and gunk within the incinerator. Although the ToD does not incinerate their own waste locally, this slows down the productivity of the DPW and ignores an environmental solution. Julie also helped introduce me to some of the landmarks in Dennis which could be made into icons for the app. These locations include the local beaches, parks, and the Scargo Tower. The inclusion of these locations as icons helped to create a more community centric approach to the apps design.

The App Design

The Sustainable Dennis Community App seeks to provide an easy to use map of Dennis with student-designed icons and selectable filters to help citizens and visitors sustainably enjoy the attractions in Dennis. Opening the app would show a map of Dennis with icons of public recycling and trash cans, water refill stations, EV chargers, composting sites, trails, parks, beaches, municipal properties, local landmarks, and “Icon Status” businesses. These icons would all be designed to look like the locations or service they represent. As for who are to design the icons, local students were decided as best. I had the pleasure to speak with members of the ToD DPW, including the DPW Director Michael Lavin.

Additionally, I helped to outline the process in which the app can be created with the help of local schools. Local high school students with an interest in graphic design are planned to help create personalized icons for the app. The involvement of local high-school sustainability programs, environmental classes, and arts students in the app's design not only gives students a creative competition, but also spreads awareness about the app and its access to sustainable resources. Integrated into ToD classes relating to sustainability, local students could compete to design the icons used in the app. In doing so students can have a creative competition and feel attached to how their design is reflected in the community.

Looking at the app, one could also see a menu for icons to be hidden. While the app seeks to promote sustainability and educating people on local topics, it should also be easy to use as a regular map when needed. This includes adding an icon only on the user's device showing where they are in relation to their point of interests. Icons being used as a point of interests could be toggled off to clearly display the map. Focusing on both community education and easy access to all people, the app is designed to be comprehensible and informative.

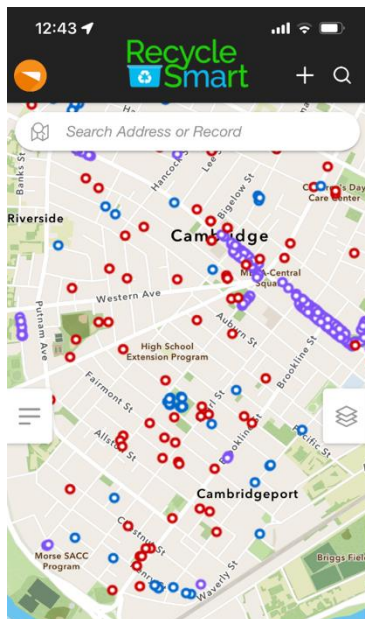
Utilizing pre-existing resources in the town of Dennis, a banner at the top of the app would display menu options on the top left and right with a link to the *Recycle Smart* Massachusetts website in the top center.



In this image the interface for *Cartograph One* is overlaid with the *Recycle Smart* logo as planned for the Dennis Sustainable Community app. This is a preexisting resource for all

Massachusetts residents allowing for users to discover what can go into their recycling and where their recycling goes. While the app is designed to be innovative, the incorporation of preexisting resources helps part of the community familiar with the resources stay familiar and introduces these resources to more people in an easy to access way. In creating an app for Dennis my project was not to make new resources for the app, but rather bring the community closer together and feel more well versed in local sustainability.

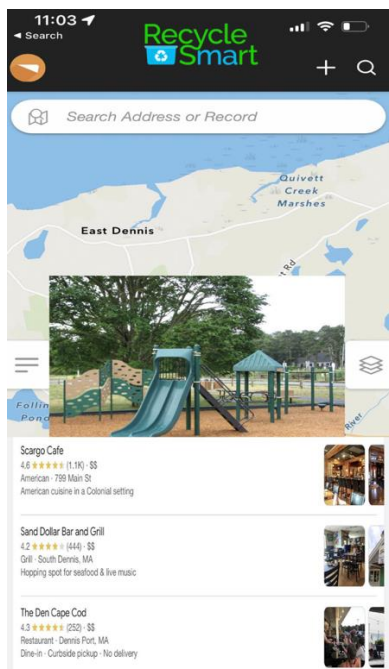
Sustainable Dennis Community App



- Icons for community resources
 - Filters for icons
 - Filter for notifications about Town meetings and events
 - Tapping on an Icon brings up a fact about the icon
 - Tapping on an Icon can also bring users to recommended sustainable businesses in the ToD
- * Note this is mapping Cambridge on *Chartegraph One* and does not have detailed icons

As mentioned above, clicking, or tapping on an icon could bring up an additional menu offering either a fun fact or local recommendations to sustainable businesses. Some of the recommendations in this menu would be sustainable businesses which have an "Icon Status" for their efforts in helping the community be sustainable. This status should be reserved to businesses who provide the town with a sustainable service in exchange for non-obstructive

digital advertisement space within the app. Examples of sustainable services may include breaking down mattresses, recycling electronic goods, and other difficult to recycle items. This restriction to businesses applying for digital advertising through the app would promote sustainable habits among community members and local businesses. For locations such as SeaView Park, the app could provide more visitors to the park and give recommendations for local businesses nearby that are sustainable.



Clicking on SeaView Park Example

- Users are shown an image of the location
- Clicking on either of the boxes to the images right or left could bring up
 - Local restaurants or business that are sustainable
 - A fun environmental or sustainable fact about the icon

* Note these businesses are used as a visual example without relation to final app design

Lastly, the Sustainable Dennis Community App is designed for users to have the option to be a “Citizen or Visitor”. This enables alerts from the Dennis DPW relating to events such as hazardous waste day, town meetings, and other community events. Doing so could help the DPW send reminders about events they either want citizens to attend or otherwise be ready for. While the feature is a nice quality of life enhancement for citizens, it is a potential game changer for organizing town events. Sending notification reminders directly to one’s phone, the DPW can advertise events with great efficiency and spread news to a larger audience.

Approval of Design by the Town of Dennis Department of Public Works

Through the help of Julie Kennie, I had gotten in contact with and presented the apps design to members of the DPW including the director Michael Lavin. In the multiple occasions I spoke with members of the towns DPW, I could see the clear importance of increasing productivity as many of the people I presented to were very excited about the idea. While Dennis does not have a means of disposing of their own garbage, it is dropped off at well-organized transfer stations. These transfer stations have a variety of clearly labeled containers where residents can dispose recyclable material.



However, waste is driven outside of Dennis to be incinerated. This waste is sold by the DPW as they take both ethics and costs into account. Additionally, some products are not easy to recycle such as mattresses and old electronics providing a need for new sustainable organizations to develop in the town. While many residents may be unaware that their trash is driven away to be incinerated, having the incinerator as an icon with an environmental fact can help open a discussion about unnecessary waste and the importance of composting. While the

ToD DPW changes where their trash is incinerated, the SEMASS incinerator is often the most ethical and cost efficient. For simplicity, this would be the only incinerator as an icon with a fact related to its emissions.

How can the App Help?

Seeking to provide an easy to use map of Dennis with student-designed icons and selectable filters the Sustainable Dennis Community App would have the filter of “Citizen or Visitor” which could turn on and off notifications for community events being held or promoted by the DPW. Although it may not be seen as a standout feature by all users of the app, its ability to increase education and attendance for all DPW events could greatly boost productivity. Currently, many environmental issues stem from miseducation and the Sustainable Dennis Community App could help to bring the local community together for DPW events getting a well-deserved spotlight and greater attendance. DPW productivity would also be boosted as it could reduce disposal costs and risks through the community finding more businesses’ who are willing to help. Along with this increase in education related to being sustainable in the town, citizens would be more likely to be less wasteful and have an increased level of conservation to local natural resources.

Future Plans for the App

In the future when the app has approval from school superintendents and the ToD Department of Commerce, the app will be ready for coding and other tech related work. Although the app offers many features, it is designed to have little maintenance needed apart

from adding icons for new infrastructure such as sustainable businesses, electric car chargers, composting sites, and water bottle refill stations. Apart from the relocation and creation of icons, DPW event notifications is expected to be most of the maintenance. Once the app is functional in Dennis, I hope it can serve as an example to other communities as a resource to use or draw inspiration on as they make their own projects.