Proposal (Parts 1&2) with Recommendations

Merin English
Yunzhu Zhou
Timothy Mayell
Chris Harrigan

The problem the client faces is reforming society's relationship with the environment. The documentary will solve the problem by first listing human interests that have a negative effect on the environment. Then, list how society could combat these issues in ways like riding bikes or other more positive ways to reduce our energy consumption. The targeted audiences of the documentary are Asian Americans and Pacific Islanders from a background in the New England area. We all have access and are constantly connected to the Internet, so we can also use social media as a medium to educate society about how people's daily actions affect the environment in a way that's detrimental to life on Earth.

All interviews keep the exposé style, and they all tell stories of only one specific individual. They all create a sense of "emotional connection" or an insider's scoop on either a personal struggle or life event that many people can relate to on some level. Additionally, the interviewees spoke about how at first they found themselves indifferent in their lives initially, but all end up in better situations at the end. There was a conflict, whether it be large or small, and they were all resolved by the end of the interview. The front pages of the website were incredibly similar to each other. Featuring a logo or title with the name of the organization, a few different tabs directing the audience to other parts of the site, and some (but not all) have a description of what the organization's purpose was. As for style, every website was simple and could probably use an update.

All interviews are effective because they have an emotional aspect to the narrative. The Michelle Obama interview makes it feel like the audience is learning information that nobody else knows, it creates a little bit more of an intimate relationship. Aunty Amy and and Undocumented Students Journey to Harvard grabs the attention of international students and immigrants, because it is something they can relate to: wanting a better life. All of the stories

also create a want by the audience to learn more about the interviewee because they feel so connected. The effectiveness of the front pages are all extremely similar. These pages are well set up and easily interactive for the user, but could use something to make it more inviting. They lack visual attractiveness, and statements really explaining what they are and their core values, and purpose.

Discourse Analysis

The first theme is "Advice for young people who want to work in a non-profit/civic organizations". These are the recommendations, tips and tricks from Leverett Wing, Janelle Chan, Peter Kiang and Jason Chou that they have seen as useful in their lives as fields of work. Leverett found the best way to create change in the community is to educate and get people involved. Kiang said "There was never any one person who [could've] played that mentoring role for [him]"(timecode: 10:07-10:16), he just learned by observing others around him. As for Janelle, she suggests that in order to find where you are meant to be, and how to really make a difference "ask nonprofits 'where am I needed?' and 'How can I contribute?' instead of asking yourself 'How to build up my resume?'"(timecode: 9:29-10:10). Lastly, Jason Chou learned from experience that in order to get work done, and make a change you have to try not to be idealistic. He says to be open minded and think out of the box.

The second theme is "Individuals and organizations that progress communities". They are related to the organizations where Leverett Wing, Janelle Chan, and Jason Chou work in. In the interview, Leverett Wing said the purpose of his job was to "focus more on civic engagement". Wing also said that "I don't think folks realize that decisions are made everyday by staff, by elected officials in different agencies in city, states, and federal governments" (timecode: 8:16). Janelle Chan said in the interview that the purposes of her job and her employer MBTA are to

“build public spaces and public assets that really benefit everybody” (time code:2:24-2:27). She provided Chinatown as an example of “make more opportunities for future immigrants” (timecode: 5:39-5:44). Chan pointed out the goals of MBTA is “to help people connect literally and be a big part of equity, regional growth, and economic development” (timecode: 17:33-17:37) and “to create vibrant neighbourhoods” (timecode:20:11-20:15). As for the AAPI community, Jason said that the progress the community had make is that voters have “selected several representatives to our legislature, and city of Boston”. He believed that “only when you’re up at the higher level can you really make the changes for everyone else”.

The third theme is “How organizations solve community problems”, which is about how organized solve problems in the community. Leverett Wing said he was one of the “first executive director of the Massachusetts Asian American Commission” which helped Asian communities with “civic engagement”, Kiang refers to “a lot of getting people involved, it’s a lot of getting people educated about the electoral process, about government” (timecode:1:44-1:53), and Kiang mentions it’s really education that remedies issues, and the lack thereof creates problems (timecode:7:56-8:01) . He said that without education we just live in “stereotypes and racial realities and whatever they can figure out on their own”(timecode: 8:08-8:13) . Janelle Chan describes how the organizations she's worked for aim to help by building public spaces, “[they] develop projects in a way where they catalyze vibrant neighborhoods to pop up” (timecode:1:09-1:13), also to “build affordable housing, mixed-income housing, in the Boston region” (timecode:1:58-2:03), and maintaining a good public transit system because “public transit, is a key asset to Asian Americans” (timecode:17:11-17:17), finally to create a space for AAPI voices by “pushing for disaggregation of this data” (timecode: 22:29-22:32). Jason Chou

also talks about how organizations such as ACDC have managed to work with the community to "develop over 400 affordable housing units" (timecode:13:49-13:57).

Historical Analysis

The types of documents that the group analyzed were photographs, articles, maps, and newspapers, and factsheets. A letter from John Moakley as state representative to Richard T. Ferrara. A fact sheet that the US EPA sent out to the public about automobile fuel economy. One letter from WGBH to John Moakley. Three images of public transits and commuter rails from MBTA's 1991, 1995, 1997's annual report. Three articles about MBTA: the first one is about electric trolleys, the second one is about demand for parking at MBTA stations, the third one is about raising T fares and car use. The era in which those documents were produced were from the 1980's to present. In conclusion, all of these documents inform us about different forms of transportation in Boston.

The types of documents that we found were Newspaper articles, congressional reports, maps, and letters. An example of a newspaper article we found was called "Raising fares—and car use" by the Boston Globe. It was about the relation between the impacts of higher fares and more cars on the road. Other Boston globe news articles examined eco-friendly trolleys that combat CO2 emissions and the relationship between cars and traffic due to lack of parking spaces.

Congressional reports: Automobile fuel economy (US Environmental Protection Agency)

The Congressional fact sheet sent out by the US Environmental Protection Agency talks about what affects car emissions have on the environment as well as explaining what fuel economy is. Since the report is meant for the public, it breaks the topic down into simple sections to help answer questions the public had about what fuel economy is, and how emissions affect

the environment.

Letters: from Moakley to Richard T. Ferrara

This was a letter that John Moakley wrote in reply to a letter from Richard T. Ferrara thanking him for his letter in regards to a petition Moakley was involved with to clean up Boston Harbor. The petition included changing the procedures for the use of spraying pesticides from planes, which was Ferrara's business. Ferrara voiced his opinion about the effect going forward with this change of procedure would have on his business.

Maps: from MBTA's annual report

The map from MBTA 1981's annual report presents all commuter rails of the great city of Boston. The 1895's map of rapid transit lines presents added stops and stops that were named differently from today. The 1987's map presents the distances from every last stop of the commuter rail line to South Station and North Station.

For the Fact Sheet from the EPA, right on the first page it says the reason this document was created was because "the EPA [had] received a large number of inquiries from the public related to automotive fuel economy…", so we can assume the public was interested in learning more and helping the environment through learning about fuel economy. Over and over again from the interviews we've held, what is reiterated is that in order to make change, you must educate the public, and raise their interest. Once you do this, change will happen little by little with the help of everyday citizens.

To sum it up, the MBTA has contributed heavily to the environmental well-being of Boston. Not only have they directly impacted the number of cars on the road that emit CO2 but

they also have introduced eco-friendly trolleys and connected more communities over the 1980's.

Documentary

In our documentary will first try and educating people by first listing human interests that have a negative effect on the environment, then explain how society could combat these issues in ways like riding bikes or other more positive ways to reduce our energy consumption.
Our target audience are people with Asian Americans and Pacific Islanders backgrounds in the New England area. In the documentary we will include intimate interviews with notable people that have produced real change in their communities. We will include stories from our interviewees about their communities and the people living there. Our interviewees will also talk about projects they have worked on that have benefitted those communities and how the environmental friendly technology they have introduced has made their community a better place. Some themes we will include are individuals and organizations that progress communities, advice for young people who want to work in a non-profit/civic organizations, and how organizations solve community problems. Mainly we will focus on advice for young people since we want our viewers to gain something from watching our documentary that they can apply to their lives/careers.

Theme

One theme that shall be included in the documentary film and need to be illustrated is: Advice for young people who want to work in a non-profit/civic organizations. Interactive website discusses why this is the most effective way to present the order of the themes and how the audience may establish a relationship with the interviewees.

Janelle Chan says: " ask the organizations what they need of you, [...] how do I build up my resume? That's not the way to approach things. You want to make a difference, you go to these non-profits, you go to government, you ask them: where am I needed? Don't go there with some sense of ideas of what an organization needs, go to them and ask them humbly, how can I contribute?" (time code: 9:29-10:10)

Leverett Wing says: "One of the biggest obstacles I've noticed is just apathy. Voter apathy, or the unwillingness to get involved or making civic engagement a lower priority than it should be[…] I don't think folks realize the impact that those have on their day to day lives. Just the simple act of voting is a very powerful act…"(timecode 7:55-8:40)

Leverett also addresses that "I would suggest and I would recommend to students and younger folks who are trying to get involved in public life is to focus on building skills that will give you more options in the future. Don't focus on the money so much and don't focus on the status or prestige of a particular title. Those are important, but focus on learning, focus on what am I going to get out of this, what skills am I going to get out of this, […]"(timecode 9:23-9:50)

The two interviewees suggest that young people should look more into their contributions to nonprofit organizations and try to engage the community to help and create a better life for people.

<u>The Webpage</u>

The frontpage of the website for Environmental Renewal Now© will be a continuously-scrollable, website which will contains the following; a short preview video of Environmental Renewal Now©'s documentary *Environmental Renewal Now© - Advice for young people who want to work in a non-profit*, an interactive map of the City of Boston that showcases key historic and future landmarks which bring up videos, data, and relevant documents when clicked

on. It was also display on the map major transportation routes and train stations. The names of the stations and roads will be clickable and a pop up will show the history of the area, its future state, and things like how the MBTA has contributed heavily to the environmental well-being of Boston by making a specific landmark significant to our mission. It will have horizontally-aligned text link inside small rectangle boxes at almost the very top of the page which reads and goes to the "About us" page, the "Key Figures" page, the "Current Projects" page, and a "Historical Document" a basic drop-down menu. The drop-down menu will contain a text link reading "About Historical Documents" page which lists the type of documents in Environmental Renewal Now©'s online document archive. There will be press and media documents, such as articles, podcasts, news clips, congressional reports, letters, and maps, which are all relevant to Environmental Renewal Now© and its affiliates. The drop-down menu will include another text link reading " Environmental Renewal Now© Document Archive". The page will contain all relevant historical documents of Environmental Renewal Now© and of its affiliations including organizations, individuals, etc. On the bottom of the page there will icon links of Environmental Renewal Now© social media pages, a newsletter sign up form, and an Environmental Renewal Now© logo with our contact information underneath. Below that section of the page, you will be able to scroll down even further to another page that has a big title that reads "Advice for Young People Who Want to Work in a Non-profit Organization". Below there is a small short film video on the subject of and entitled "Advice for Young People Who Want to Work in a Non-profit Organization" created by Environmental Renewal Now© and other nonprofit organizations, and individuals affiliated with Environmental Renewal Now© Below that section of the page, you will be able to scroll down even further again to another page that has a big title that reads "Individuals and Organizations that Progress Communities". Below there is a small

short film video on the subject of and entitled “Individuals and Organizations that Progress Communities” created by Environmental Renewal Now© and other nonprofit organizations, and individuals affiliated with Environmental Renewal Now© . And once more below that section of the page, you will be able to scroll down even further again to another page that has a big title that reads “How Organizations Solve Community Problems”. Below there is a small short film video on the subject of and entitled “How Organizations Solve Community Problems” created by Environmental Renewal Now© and other nonprofit organizations, and individuals affiliated with Environmental Renewal Now©.

This layout of a continuously-scrolling webpage will be effective in establishing a relationship with our audience because it will be fun to explore and will be a great user experience because it is unlike most other single page website layouts.

/environmentalrenwal

www.environmentalrenewal.org

Bookmarker

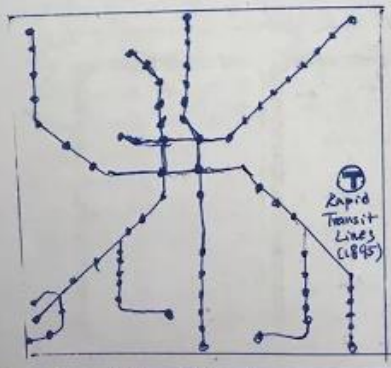
About US | Key Figures | Current Projects | Historical Documents

- 1970s
- 1980s
- 1990s
- 2000 to present

Environmental Renewal NOW!

Documentary:

0:00/1:05:09



(Facts)

(Accomplishments)

(Interactive)

Newsletter Sign Up

Email Address:

First Name:

Last Name:

Subscribe

Upcoming Events:

Contact Us:

xxxxx@xxx.com

xxx-xxx-xxxx

Appendices

Newspaper articles
1. Raising fares—and car use Boston Globe
2. Panel finds soaring demand for parking at MBTA stations Boston Globe
3. Electric trolleys OK'd despite some opposition Boston Globe
4. MBTA to receive first Orange Line cars from China in December progressiveallroading.com
5. Marty Walsh: Alcohol ads on MBTA send "wrong message" Boston Herald
6. MBTA: No Green D-Line service for 3 weekends for tree work patch.com
Congressional reports
7. Fact sheet: Automobile fuel economy (US Environmental Protection Agency)
Letter
8. Letter from Moakley to the Friends of the Earth
Maps
9. MBTA map – 1981
10. MBTA map – 1985
11. MBTA map - 1987

Appendix 1 Raising fares—and car use *Boston Globe*

The MBTA is on shaky ground in balking at an environmental-impact review of its proposed fare increase. It should reconsider its position before taking any further action.

The proposed increase in rapid transit fares -- from 60 to 75 cents -- may be justified on economic grounds. The MBTA's fares are among the lowest in the nation, and even with the increase, they would continue to be so.

The concern, however, is that the increased fares could prompt some riders to get back into their cars and onto the highways. That is never a good idea, and it is a worse one on the eve of the start of construction on the Central Artery/third harbor tunnel project.

The impact on ridership was a concern in 1981, the last time rapid transit fares were increased. (The increase was to 75 cents, but it was rolled back to 60 cents.) At that time, the MBTA signed an agreement with the Conservation Law Foundation that any fare increase would be subject to an environmental-impact review.

The MBTA is now welshing on that agreement, arguing that state environmental regulations require a review only if a proposed increase would equal 30 percent over three years. The MBTA overlooks the fact that the regulations do not forbid a review if an increase would be less than that. The regulations also require a review if a project would generate 3,000 car trips a day. That could happen if just 1,500 commuters leave the MBTA because of the fare increase. And in its own worst-case scenario, the MBTA thinks there could be a 5 percent drop in ridership.

There are other issues to consider. Perhaps single-ride fares should be increased, but the cost of a monthly pass should not be. Perhaps fares should be reduced at off-peak hours. Perhaps all fares should be reduced to induce more commuters to leave their cars at home during the artery/tunnel construction.

State environmental officials probably have sufficient grounds to order an environmental review. But the MBTA should be interested enough in obtaining the best information on this issue to do the study on its own.

Appendix 2 Panel finds soaring demand for parking for parking at MBTA stations *Boston Globe*

If you've tried in vain to get a parking space after 7:30 a.m. weekdays at the Braintree Red Line station garage or the Attleboro commuter rail stop or at dozens of other MBTA stations, you know how severe the T's parking shortage is becoming.

The Massachusetts Bay Transportation Authority Advisory Board, which monitors the system's finances and performance, says in a new report that the MBTA appears to be meeting only 50 to 60 percent of demand for parking. Put another way, up to twice as many people want parking as can get it.

Figures released last week show that commuter rail ridership soared 48 percent from 1982 to 1987. With the opening of the Needham line and return of service through Back Bay on South Station routes last October, ridership is running 16 percent ahead of last year. But there are only 12,003 parking spaces for the 29,000-plus daily commuter rail riders, and parking has grown nowhere near as fast as ridership.

On the rapid transit system, with 14,821 parking spaces, the shortage is equally severe. A recent MBTA survey found that every parking facility on every line is full on an average weekday, except for the three facilities on the Mattapan trolley line and the 2,200-car Alewife Red Line garage. (At Alewife, next to Route 2, 90 percent of the parking spaces generally are filled and earlier this year the garage was full for the first time since it opened in April 1985, suggesting it will soon join the list of facilities that are always full.)

"While planning for passenger capacity has received high priority during the last few years, there is little evidence of the same effort having been put on parking access," the board charges.

And the advisory board and the state Senate Post Audit Committee both warn that the MBTA may not be able to add enough parking in time to accommodate the waves of commuters expected to flee the highways around 1990 as Central Artery-third harbor tunnel construction begins in earnest.

MBTA planners have set a goal of adding 25,000 new parking spaces to the system in coming years, which would double available parking, with regional facilities at every place a rail or transit line crosses Route 128 or Interstate 495.

Construction is under way in several places: a 502-space lot in South Attleborough, a 758-space lot in Franklin at I-495, a 1,000-car garage in Lynn. Plans are under way for a 1,000-car facility off Route 107 in Saugus, expansions to Braintree and Quincy Adams Red Line garages, and big regional facilities near I-495 in Littleton and next to the former Weston dump off Route 128. Space for 7,800 more cars has been located next to stations on North Station routes.

But parking is not cheap or easy to build. An engineers' rule of thumb is that no-frills parking lots generally cost about $1,000 per space; garages are several times that amount. And a typical community reaction is that of a Dedham selectman who called plans to build a new 1,000-car garage and station off Route 128 "absolutely the worst thing that has threatened to happen to the town in years."

For a system that saw ridership and public favor plummet through the 1970s and early '80s, being a victim of success -- especially so in commuter rail -- is an unusual experience. Concern is widespread that, as far as parking is concerned, the MBTA will be playing catch-up for several years.

One more indication that Atlantic Avenue is going to be torn up for six or seven years to build the new Central Artery: Documents show the MBTA plans a three- to six-month redesign of the South Station Red Line renovations "due to relocation of the depressed artery." Some construction will be suspended. Under an Atlantic Avenue route, the highway could go straight through the mezzanine or, at a much greater cost, under the transit line. Artery-tunnel planners are choosing between building a section of the northbound road under Fort Point Channel, which avoids city streets but poses environmental nightmares, or under Atlantic Avenue, which would be cheaper and faster but have potentially huge impacts on automobile and Red Line traffic. It is widely understood that Atlantic Avenue has been chosen, but no announcement has been made yet.

Events this week: The fate of Green Line trolley service to Watertown, which has been "temporarily suspended" since 1969 and which the MBTA is not eager to restore, will be discussed during a public hearing Thursday at 7:30 p.m. at the V.F.W. Hall in Oak Square, Brighton . . . If you like the musical sculptures at Kendall and the uncomfortable marble seats at Downtown Crossing, you'll love this weekend's International Art in Transportation Symposium at the Marriott Hotel in Cambridge's Kendall Square. A dozen presentations and symposia -- including a report on the circus, soccer match and cooking demonstrations held in the Paris Metro -- will take place Friday through Sunday; call 498-9033 for information.

MBTA PARKING

The T's five largest parking facilities (available spaces) on commuter rail and rapid transit lines.

Appendix 3 Electric trolleys OK'd despite some opposition *Boston Globe*

A 12-year-old dispute over transit service between Dudley Square and downtown was thrown to state officials to decide yesterday, but city political leaders and activists favoring streetcars vowed to step up their campaign.

The turning point came as Massachusetts Bay Transportation Authority directors voted, without comment, to approve what T staff members called a compromise plan to use electric buses to replace service that was provided by elevated trains before the Orange Line rapid transit route was moved in 1987.

But the Washington Street Corridor Coalition, representing activists in the South End and Roxbury, said it would press to have the Dukakis administration order the T to do environmental and economic studies to determine if electric buses, also called trackless trolleys, would provide more benefits to the community than light-rail vehicles using tracks laid in the street.

"They've never done an in-depth analysis," added Boston City Councilor Bruce Bolling, a supporter of fixed-rail trolley service. Bolling said community sentiment has long favored LRVs.

Boston Transportation Commissioner Richard A. Dimino said he also supports a fuller study of the T's proposal. "It will be incumbent on the T to prove to the constituency along the corridor that has long supported LRVs that the electric bus service will in fact be a better service."

State Transportation Secretary Frederick P. Salvucci, who also is MBTA board chairman, said yesterday that with no hope of obtaining federal aid for laying tracks for light-rail streetcar service, electric buses offered a pollution-free alternative over continuation of current diesel bus service.

He said the cost of either light-rail vehicles or electric buses has been put at about $100 million, but added that an electric bus route would not require land acquisition.

Bolling said that with costs about equal, the MBTA should have favored the service that he said the community prefers.

According to documents to be submitted to the Massachusetts Office of Environmental Affairs, the buses would travel along Washington Street for most of their 2-mile route to downtown, using a now-idle streetcar tunnel to connect with Green Line rapid transit trains at or near Boylston Station.

The T said passengers would be able to transfer to Green Line trains without charge, a condition that has been demanded since discussion of a replacement service first began in 1973.

At Bolling's request, the City Council's committee on city and neighborhood services is scheduled to hold a public hearing on the electric-bus proposal on Feb. 23 from 6 to 9 p.m. at the Dudley branch of the Boston Public Library.

Appendix 4 MBTA to receive first Orange Line cars from China in December
progressiveallroading.com

The Massachusetts Bay Transportation Authority (MBTA) next month expects to take delivery of four new Orange Line cars manufactured by China Railway Rolling Stock Corp. (CRRC).

Yesterday, the units arrived at the Port of Shanghai ready for shipping to Boston, MBTA officials said on Twitter.

When the new units arrive in Boston, they'll begin months of "rigorous testing," MBTA spokesman Joe Pesaturo tweeted. The first six Orange Line cars will be shipped from China, with hundreds more to be built at CRRC's new plant in Springfield, Massachusetts.

Last month, MBTA officials said the agency expects the new plant to be completed in winter, with full rail-car production slated to begin in April 2018.

In 2014, CRRC was awarded a $566 million contract to design and manufacture 152 Orange Line vehicles and 132 Red Line units. In December 2016, the MBTA ordered 120 additional Red Line vehicles to replace the entire fleet on that line.

Appendix 5 Marty Walsh: Alcohol ads on MBTA send "wrong message" *Boston Herald*

Boston Mayor Martin J. Walsh yesterday slammed the MBTA's decision to break from a five-year ban on alcohol advertising, saying the cash-strapped T should look at other revenue streams before allowing the controversial ads.

"You don't need the revenue that much. I think it's 2 million bucks," Walsh said yesterday. "Come up with other ways of finding revenues. There are plenty of companies out there — between Amazon and Apple and other places — that will buy that space on MBTA property."

Walsh, a recovering alcoholic who has been an outspoken advocate for those struggling with substance abuse, supported the T's decision to get rid of alcohol ads back in 2012, when he was a state representative. On Monday, MBTA brass agreed to re-introduce alcohol advertisements in stations with lower student ridership.

"I think it's the wrong message to send to our young people, and those ads aren't targeting adults," Walsh told the Herald in an interview yesterday after serving Thanksgiving meals to homeless diners at the Pine Street Inn. "They're targeting little kids just like the cigarette ads were in the '80s and '90s."

The MBTA has estimated alcohol ads could bring in $2.5 million, and T leadership noted earlier this week that the ads will not be allowed near schools or in stations where more than 10 percent of passengers use student passes. That means ads won't be seen at stations including JFK/UMass, Roxbury Crossing, Ashmont and Forest Hills.

The MBTA plans to begin reintroducing the ads between December and mid-March.

Starting April 1, the MBTA could begin selling ads that would wrap around a maximum of 15 trains.

T leadership anticipates that the increased revenue will pay wage costs for 30 positions that have already been approved for the fiscal year 2018 budget.

"The additional revenue will fund the wages of dozens of employees in critical positions necessary for maintenance and upgrades to the transit system," said MBTA spokesman Joe Pesaturo.

Appendix 6 MBTA: No Green D-Line service for 3 weekends for tree work *patch.com*

NEWTON, MA — If you're planning on riding the Green Line this weekend... or next... or the next, take note: the D-Line won't be running on some stretches as it will be replaced by shuttles. So plan ahead.

As part of winter preparations, an outsourced crew of tree trimmers will be working to remove multiple trees and large limbs along two sections of the D branch of the Green Line over the next three weekends.

Crews will be targeting trees and rotting branches that have been identified as posing a threat due to dead or rotting branches or branches that may be susceptible to coming down during a windy storm or heavy snow, according to the MBTA.

In the recent past, there have been downed trees or tree branches adjacent to the MBTA's right-of-way that have fallen onto the tracks or on the overhead wires, causing damage and resulting in service interruptions.

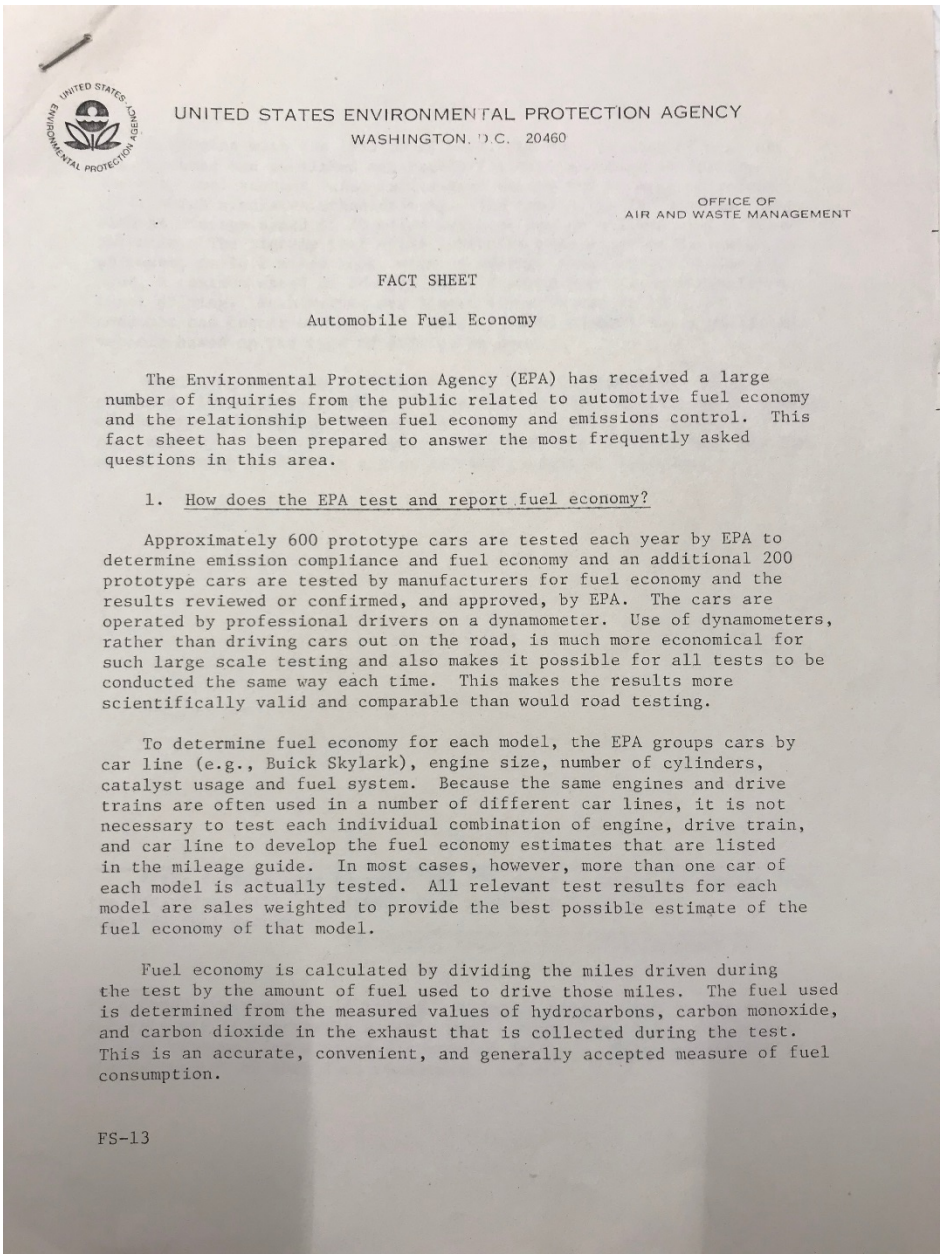
"Removing hazardous tress along the alignment is a public safety issue," said an MBTA press release.

The tree crews will be out and about during daylight hours (and yes, the equipment they have to use makes noise) on the Green Line's D Line branch on these three consecutive weekends:

November 25 & 26 from Reservoir to Fenway, in both directions. Shuttle bus service will be provided.
December 2 & 3 and **December 9 & 10** from Brookline Village to Newton Highlands, in both directions. Shuttle bus service will be provided.

"The MBTA wishes to thank customers and abutters for their understanding as the T works to continue to provide safe and reliable service along the MBTA's Green Line," reads a statement.

Appendix 7 Fact sheet: Automobile fuel economy (US Environmental Protection Agency)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
AIR AND WASTE MANAGEMENT

FACT SHEET

Automobile Fuel Economy

The Environmental Protection Agency (EPA) has received a large number of inquiries from the public related to automotive fuel economy and the relationship between fuel economy and emissions control. This fact sheet has been prepared to answer the most frequently asked questions in this area.

1. How does the EPA test and report fuel economy?

Approximately 600 prototype cars are tested each year by EPA to determine emission compliance and fuel economy and an additional 200 prototype cars are tested by manufacturers for fuel economy and the results reviewed or confirmed, and approved, by EPA. The cars are operated by professional drivers on a dynamometer. Use of dynamometers, rather than driving cars out on the road, is much more economical for such large scale testing and also makes it possible for all tests to be conducted the same way each time. This makes the results more scientifically valid and comparable than would road testing.

To determine fuel economy for each model, the EPA groups cars by car line (e.g., Buick Skylark), engine size, number of cylinders, catalyst usage and fuel system. Because the same engines and drive trains are often used in a number of different car lines, it is not necessary to test each individual combination of engine, drive train, and car line to develop the fuel economy estimates that are listed in the mileage guide. In most cases, however, more than one car of each model is actually tested. All relevant test results for each model are sales weighted to provide the best possible estimate of the fuel economy of that model.

Fuel economy is calculated by dividing the miles driven during the test by the amount of fuel used to drive those miles. The fuel used is determined from the measured values of hydrocarbons, carbon monoxide, and carbon dioxide in the exhaust that is collected during the test. This is an accurate, convenient, and generally accepted measure of fuel consumption.

FS-13

Beginning with the 1975 model year, the fuel economy of each car was measured and published separately for city and highway driving. The city fuel economy value is measured during the Federal emissions test, which simulates urban driving. The test cycle is 7.5 miles long, with an average speed of 20 miles per hour and an average of 2.4 stops per mile. The highway test cycle, which is made only for fuel economy purposes, is 10.2 miles long, with an average speed of 48.2 miles per hour, a maximum speed of 60 mph, and 0.1 stops per mile and simulates rural driving. Both values are listed for each car so that the consumer can better estimate his expected fuel economy for a particular vehicle based on the type of driving he does.

Beginning with the 1976 model year, a third number was added, the combined city/highway average.*/ The combined fuel economy is an average of the city and highway fuel economy values weighted 55% and 45% respectively. The Federal Highway Administration has reported that 55% of all driving is done in cities and 45% is done on highways.

---

*/The formula used to calculate the combined miles-per-gallon from the individual city and highway fuel economy values is:

$$\text{Combined fuel economy} = \frac{1}{\frac{0.55}{\text{city MPG}} + \frac{0.45}{\text{highway MPG}}}$$

This formula gives what is called a harmonic mean, which is the most accurate way of expressing a car's fuel consumption, i.e., the amount of fuel consumed for a given distance of driving. Miles-per-gallon is the reciprocal of that fuel consumption value.

2. Are EPA's fuel economy figures representative of actual driving conditions?

No standardized test can ever represent each person's individual driving. (See 3, below). Therefore, the user of the EPA's fuel economy estimates must recognize that the EPA fuel economy estimates primarily provide a useful comparison of different vehicles tested under precisely the same conditions. EPA can not predict the exact numerical results for each and every driver. However, any individual driver can reasonably expect to get the same relative fuel economy performance from different models as is reported in the EPA estimates.

The city and highway driving cycles accurately represent driving patterns in city and highway driving. A recent independent survey performed for the Federal Energy Administration among 621 buyers of new cars showed that car owner's reported fuel economy experience compared with the EPA estimates as follows:

Comparison of New-Car Owners' Fuel Economy Experience with EPA Fuel Economy Estimates

Fraction of Sample	Fuel Economy Experience
6%	5 or more MPG better than EPA estimate.
8%	3-4 MPG better than EPA estimate.
21%	1-2 MPG better than EPA estimate.
13%	Equal to EPA estimate.
25%	1-2 MPG less than EPA estimate.
16%	3-4 MPG less than EPA estimate.
11%	5 or more MPG less than EPA estimate.

The study concludes that "Although there is considerable variation from the EPA estimates, it appears that the EPA combined estimate is an accurate indication, on the whole, of what actual experience will be like."

EPA and the Federal Trade Commission consider the fuel economy figures EPA publishes to be the best available estimate of fuel economy which would be obtained by the average driver in the summertime under city and highway conditions.

3. Why is there such a wide variation in fuel economy and why don't I get the EPA estimates?

Some of the factors which may be responsible for reducing fuel economy of any car below the EPA estimate are the following:

a. Driver behavior/trip characteristics.

Driving patterns such as quick acceleration, frequent stops and starts, long periods of idling, short trips, and uneven speed decrease fuel economy. Part of this is in individual driving habits and part in driving conditions that depend on where you live.

b. Vehicle maintenance.

A properly maintained vehicle gets better mileage than a poorly maintained vehicle. The average car that is in need of a tune-up experiences a 5-8% fuel economy improvement immediately after a tune-up. Deterioration between tune-ups depends on how far the car is allowed to get out of tune before the next tune-up.

c. Weather conditions.

There is about 1-2% loss in fuel economy for each 10°F drop in temperature. (The EPA test is made at about 75°F.) Driving into a headwind also reduces fuel economy. Rain may reduce fuel economy by 10% compared to dry roads. Typically, for any car, fuel economy is poorer in winter than in summer, although the use of air conditioning in the summer can obscure that effect.

d. Altitude and grades.

If a car is driven at high altitudes with the carburetor and ignition system calibrated for sea level to 1000 feet, a fuel economy loss should be expected, (e.g., 15% at 4000 feet). Driving up grades and on winding roads will also result in lower fuel economy. For a 3% grade, this penalty is about 33%. Curves and grades are not included in the EPA test, which simulates level driving on dry roads with neither a headwind or tail wind.

e. Road conditions.

Poor road surfaces also reduce fuel economy. Badly broken and patched asphalt causes a 15% penalty at 40 mpg compared to a smooth road. Gravel causes a 35% penalty; dry sand, a 45% penalty. The EPA test corresponds to a well maintained, dry, smooth, paved road.

f. Vehicle loading

The loading of a vehicle may make a considerable difference in

fuel economy. Each 100 pounds reduces a vehicles fuel economy by 1-3%, depending on the size of car. The EPA test includes the weight of two passengers but no luggage.

g. Optional equipment.

Optional equipment decreases fuel economy in two ways, the addition of weight to the vehicle and the consumption of power used to operate the equipment. These factors are more fully discussed under question 4.

h. Car to car variability.

No two cars, like no two people, are exactly alike. Variations associated with mass production give rise to variations in vehicle performance and fuel economy. Ordinarily, fuel economy variations between two nominally identical cars should not exceed 10%. Therefore if the EPA value for your model car is 20 mpg, your own car might be measured between 18 and 22 mpg if the EPA test were made on it.

4. How do vehicle weight, tires, and convenience devices affect fuel economy?

a. Vehicle weight and engine size are the most important factors affecting automotive fuel economy. Each 100 pounds of added weight decreases a vehicle's fuel economy by 1-3%, depending of course on what fraction of total vehicle weight is represented by 100 pounds. In addition to the weight which they add to an automobile, power accessories cut fuel economy by increasing the load on the engine when they are in operation. The fuel penalty for air conditioning in normal use is typically 6% but may range as high as 20% in slowly moving traffic on a hot humid summer day.

b. Automatic transmissions generally are less efficient transmitters of power than are manual transmissions, and typically give rise to a penalty ranging from 2-6% compared to manual transmission cars driven correctly. However, if manual transmission cars are not shifted properly, they too can decrease fuel economy by causing inefficient operation of the engine. The greater fuel economy advantage is seen for the manual transmission in the lighter weight ranges. This may be due in part to the use of less efficient automatic transmissions in light weight cars. Recently, the use of more severe engine calibrations on some cars with manual transmissions to enable them to meet the emission standards has resulted in some manual transmission equipped cars having poorer fuel economy than their automatic counterparts.

c. Axle ratio, which is measured by the number of times the drive-shaft turns for each time the rear wheels turn, affects fuel economy. Generally, a numerically lower axle ratio will result in better fuel economy because the engine runs slower for any given vehicle speed and,

therefore, has less internal friction to overcome. An axle ratio 10% below the standard axle ratio for that car (such as from 3.0 to 2.7) can increase fuel economy by about 2% to 5%.

5. How can I tell whether the cars listed in the Mileage Guide were equipped with the same options I am interested in purchasing?

All vehicles tested by EPA are tested with the standard equipment for that vehicle. Different axle ratios and transmissions are usually tested if more than one are available. The options on the test car are those which are bought by most vehicle purchasers. If more than a third of a certain type of vehicle are expected to be sold with an option such as air conditioning (and most domestically-manufactured cars have air conditioning), then the car was equipped with air conditioning. The same is true for other power options, such as power steering and power brakes.

6. What can I do about a car which gets poor fuel economy?

First, you should check the list of factors in question 3 which are responsible for most of the decreases in fuel economy observed in actual customer use, to see if one or more of those factors account for your low fuel economy. If you are then convinced that you are still getting abnormally poor mileage you should bring your complaint to the service department of your car dealer. If you are not satisfied with the service you received at your dealers, you should contact the manufacturer's area service representative in your area. Finally if all of the above fail, many states have a consumer protection office which may be of assistance. In some states this is a separate agency, in most it is within the state Attorney General's office.

7. What is the Federal Government fuel economy information program?

The EPA in 1973 established a voluntary fuel economy labeling program in which participating auto manufacturers displayed the results of EPA's fuel economy tests on their vehicles. The voluntary labeling program was in effect from the 1974 model year to March 1976. At that time, by act of Congress, fuel economy labeling of new cars became mandatory. This program enables consumers to compare different models and to take fuel economy into consideration when they purchase a vehicle.

The information published on the vehicle labels is also available in a booklet entitled 1977 Gas Mileage Guide that is prepared by the Environmental Protection Agency and distributed by the Federal Energy Administration. Separate editions of the booklet are published for cars sold in California (since California cars are different, to meet the more stringent emission requirements in that state) and for the

rest of the country. Single copies of this guide are available free from any new car dealer, or by writing to: Fuel Economy, Pueblo, Colorado 81009. Bulk copies are available by writing to Fuel Economy, Federal Energy Administration, Washington, D. C. 20461.

8. Fuel economy standards.

The Energy Policy and Conservation Act of 1975 (EPCA) not only made fuel economy labeling mandatory on all passenger cars and light duty trucks and required dealers to make copies of the EPA/FEA Mileage Guide available to the public, but also required that beginning in 1978 the average fuel economy of each manufacturer's new car fleet meet the minimum fuel economy standards. The standards for 1978-1985 are:

1978	18.0 m.p.g.
1979	19.0 m.p.g.
1980	20.0 m.p.g.
1980-1981	(to be established by the U.S. Department of Transportation)
1985	27.5 m.p.g.

9. What can I do to get better fuel economy?

a. Proper Maintenance

Be sure that your automobile remains in a state of good repair and is properly tuned. The needed maintenance items and schedule are described in the owner's manual and should be followed carefully. Periodic maintenance items which especially affect fuel economy are the air filter, the ignition system (spark plugs, distributor points, and ignition timing), carburetor, cylinder compression, and lubrication. A seriously defective vehicle, (e.g., spark plug misfiring, clogged air filter, improper carburetor adjustment) can suffer a penalty of 20% or more. On the average, tuned-up cars get 5 to 8% better fuel economy than the average car that is not kept in a good state of tune.

b. Combine or avoid short trips

How you use your vehicle can have as large an influence on fuel economy as the design of the vehicle and engine, and is an aspect over which the driver has control throughout the vehicle's life rather than just at the time of purchase. Short trips made from a cold start (engine not warmed up prior to use) result in much poorer fuel economy. One experiment with a car which delivered 11 m.p.g. in the EPA city test got only 10 m.p.g. on a 5 mile cold start trip, 7 m.p.g. on a 2 mile trip, and 5 m.p.g. on a 1 mile cold start trip under summer driving conditions. In winter, the fuel consumed for short trips is even greater due to the longer warmup period. It is therefore important to

combine short trips to reduce the number of cold starts. And of course, making short trips by walking, public transportation, or a bicycle will save even more fuel.

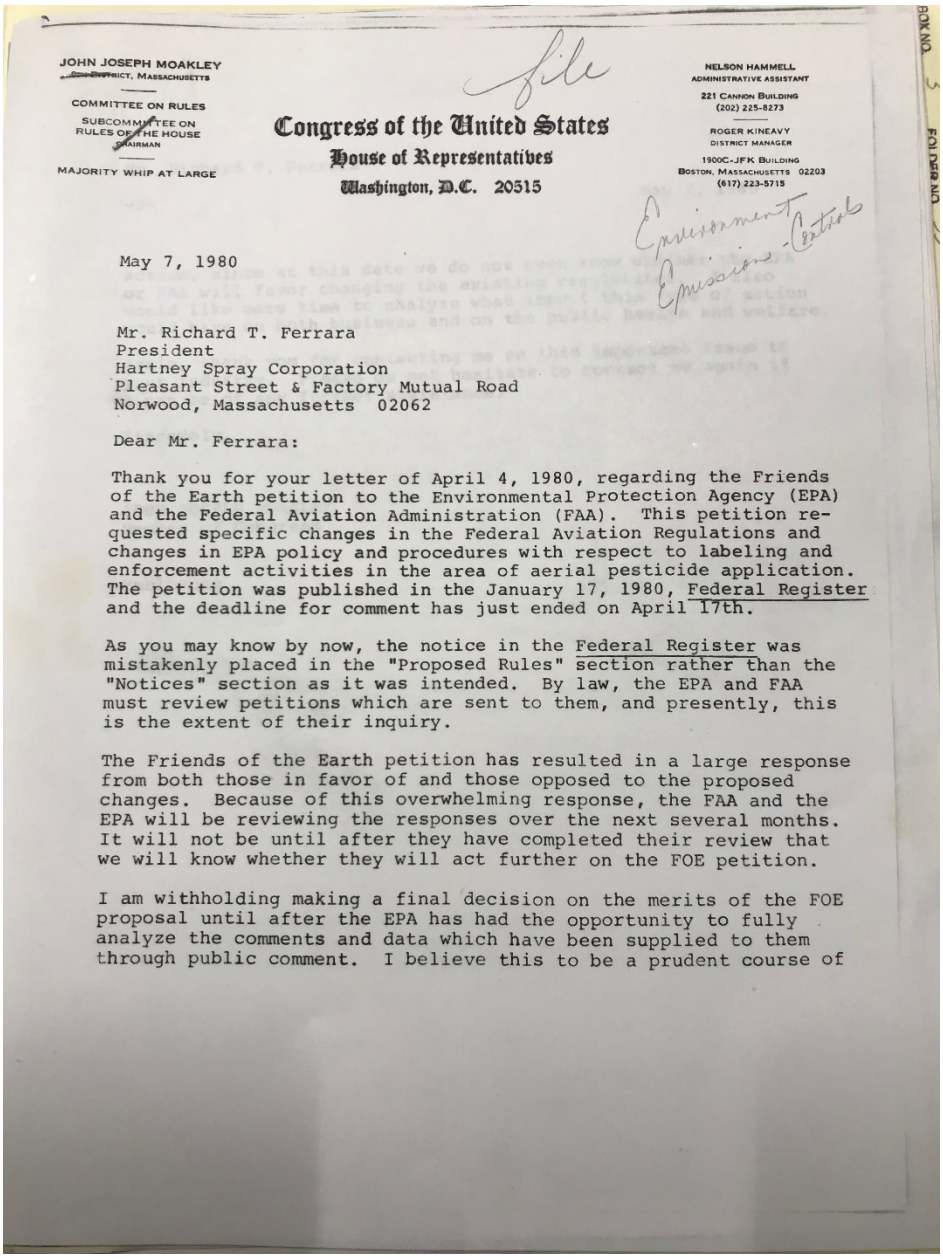
c. Avoid high speeds

The best fuel economy on most cars occurs at a steady speed near 40. m.p.h.. Cruising at 55 m.p.h. instead of 70 m.p.h. reduces fuel consumption by about 20%.

d. Drive smoothly

Slow down gradually, well in advance of traffic lights, to avoid stopping when possible. Accelerate gradually. If traffic lights in your area are timed sequentially, try to drive at the constant speed which will enable you to pass through the lights without stopping.

Appendix 8 Letter from Moakley to the Friends of the Earth



JOHN JOSEPH MOAKLEY
9TH DISTRICT, MASSACHUSETTS

COMMITTEE ON RULES
SUBCOMMITTEE ON RULES OF THE HOUSE
CHAIRMAN

MAJORITY WHIP AT LARGE

File

Congress of the United States
House of Representatives
Washington, D.C. 20515

NELSON HAMMELL
ADMINISTRATIVE ASSISTANT
221 CANNON BUILDING
(202) 225-8273

ROGER KINEAVY
DISTRICT MANAGER
1900C-JFK BUILDING
BOSTON, MASSACHUSETTS 02203
(617) 223-5715

Environment
Emissions - Control

May 7, 1980

Mr. Richard T. Ferrara
President
Hartney Spray Corporation
Pleasant Street & Factory Mutual Road
Norwood, Massachusetts 02062

Dear Mr. Ferrara:

Thank you for your letter of April 4, 1980, regarding the Friends of the Earth petition to the Environmental Protection Agency (EPA) and the Federal Aviation Administration (FAA). This petition requested specific changes in the Federal Aviation Regulations and changes in EPA policy and procedures with respect to labeling and enforcement activities in the area of aerial pesticide application. The petition was published in the January 17, 1980, Federal Register and the deadline for comment has just ended on April 17th.

As you may know by now, the notice in the Federal Register was mistakenly placed in the "Proposed Rules" section rather than the "Notices" section as it was intended. By law, the EPA and FAA must review petitions which are sent to them, and presently, this is the extent of their inquiry.

The Friends of the Earth petition has resulted in a large response from both those in favor of and those opposed to the proposed changes. Because of this overwhelming response, the FAA and the EPA will be reviewing the responses over the next several months. It will not be until after they have completed their review that we will know whether they will act further on the FOE petition.

I am withholding making a final decision on the merits of the FOE proposal until after the EPA has had the opportunity to fully analyze the comments and data which have been supplied to them through public comment. I believe this to be a prudent course of

action, since at this date we do not even know whether the EPA or FAA will favor changing the existing regulations. I also would like more time to analyze what impact this type of action would have on both business and on the public health and welfare.

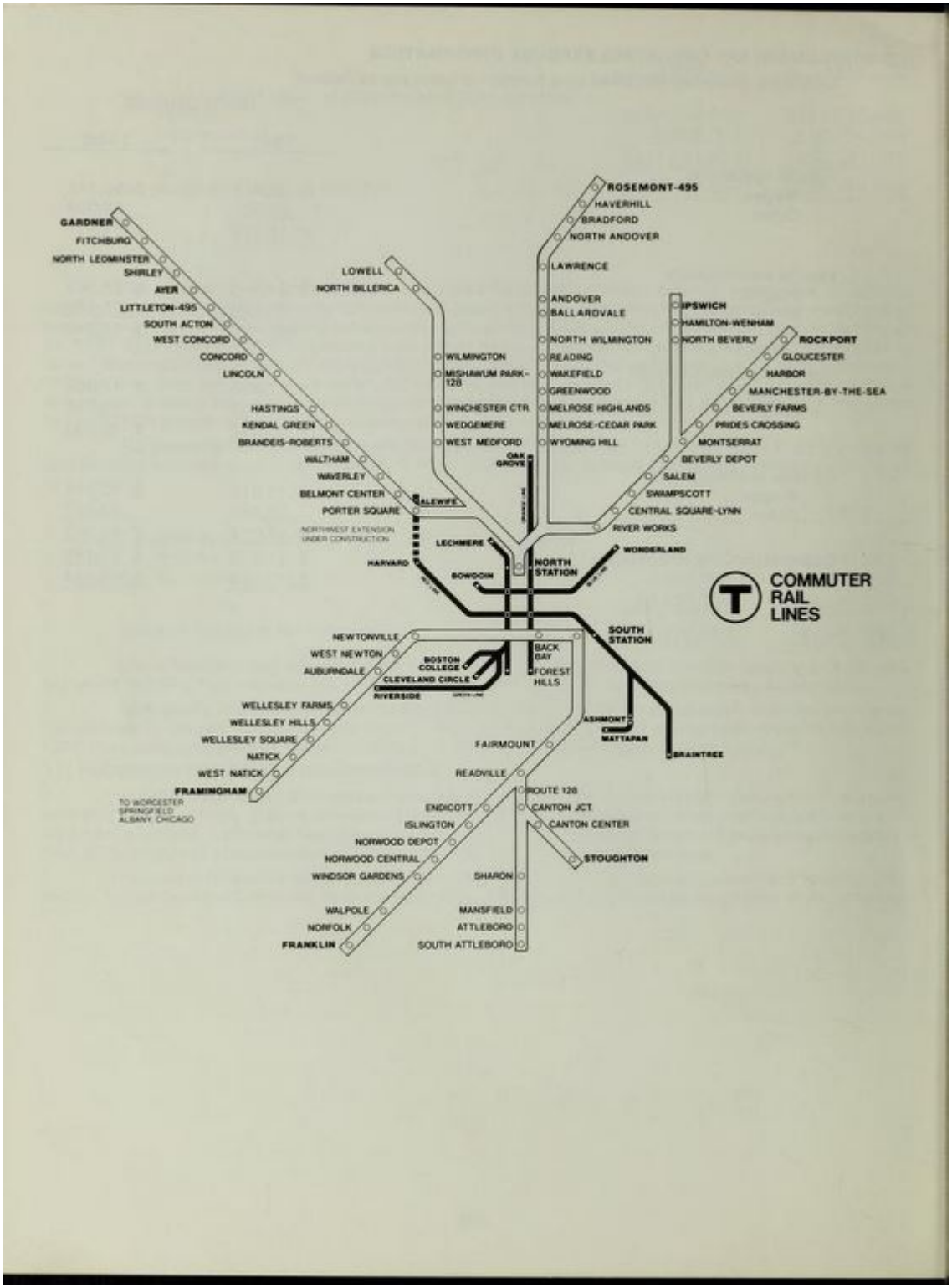
Again, thank you for contacting me on this important issue to your industry. Please do not hesitate to contact me again if I can be of any further assistance.

Sincerely,

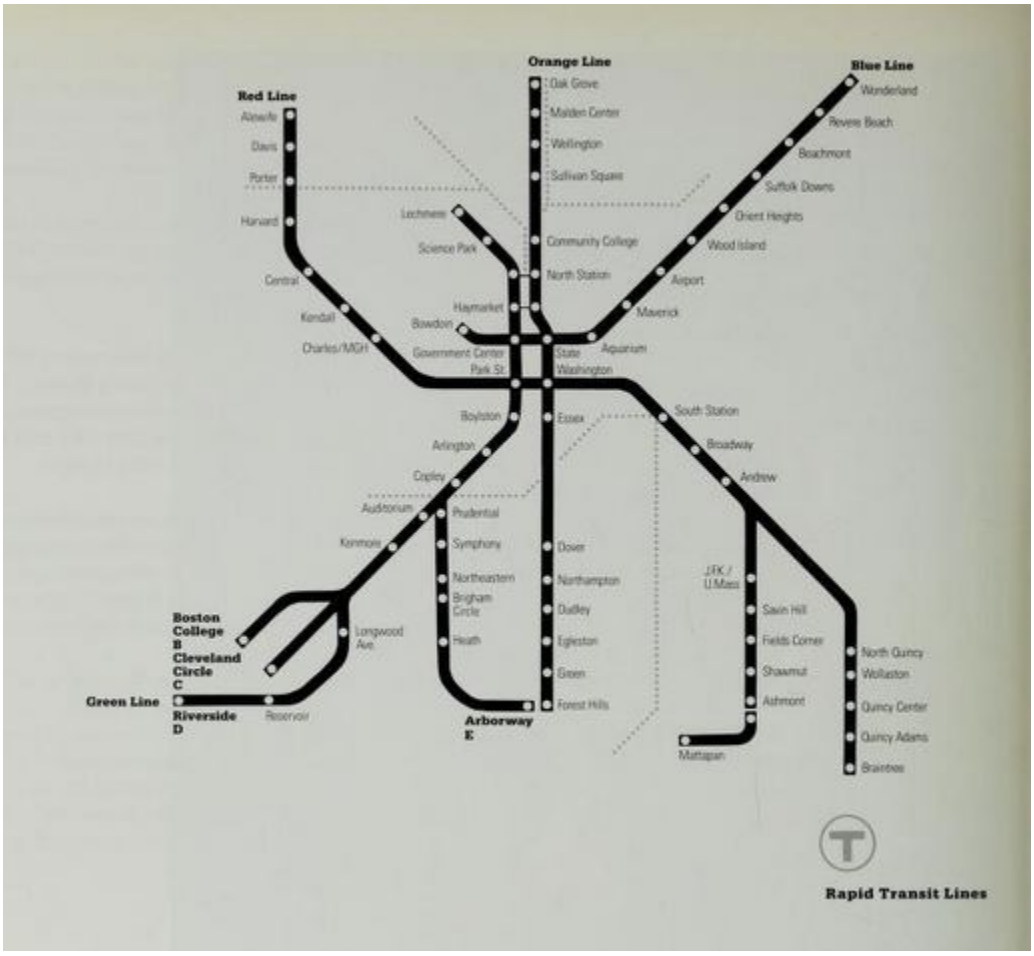
JOHN JOSEPH MOAKLEY
Member of Congress

Enclosure

Appendix 9 MBTA map - 1981



Appendix 10 MBTA map – 1985



Appendix 11 MBTA map – 1987