

PROVIDING REFUSE RECEPTION FACILITIES AND MORE:
THE PORT'S ROLE IN THE MARINE DEBRIS SOLUTION

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ABSTRACT

A marine debris pilot project was conducted by the Port of Newport, Oregon, in response to the requirements of MARPOL Annex V. Project findings are summarized. The authors also document what has been learned from the preliminary application of these findings to several other west coast U.S. ports. They discuss the different aspects of refuse collection and recycling that should be examined by a port when gearing up for adequate dockside refuse disposal.

The technical part of dealing with marine refuse in a west coast U.S. port is seldom difficult. Initiating action can be-- many ports and mariner groups do not consider marine debris a high priority item. However, those with port responsibility have responded positively to outside encouragement and minimal assistance.

INTRODUCTION

If mariners are expected to return plastics and other refuse to port they must have convenient dockside refuse disposal available to them. The U.S. Coast Guard has acknowledged this when writing the regulations to implement the provisions of MARPOL Annex V. Regulations require that all commercial ports and docks, no matter their size, provide refuse reception facilities.

While it may seem logical to expect all docks to have garbage containers, similar laws designed to control ocean pollution (e.g., those regulating oil or sewage disposal) have not succeeded because they failed to assure that facilities were universally available. Pollution containment facilities were required only of ports meeting some minimum size requirements. Mariners have often been uncertain where oil or sewage could be off-loaded.

Fortunately, this will not be the case with garbage. A fisherman off-loading fish at the processing house will be also able to off-load a

sack of plastics or a used net. A fisherman from California, calling for the first time at a port in Alaska, will know that he can find a place to deposit trash and that the port must accept his old cable.

With these regulations then, ports and docks have been handed a much-expanded if not new role as garbage collectors--a role that many ports are unprepared to handle. Realizing this lack of preparedness and the crucial role that ports would play in solving the marine debris problem, the Marine Entanglement Research Program, of the National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA) provided funding for a pilot port project. Between January 1987 and May 1988, the Port of Newport, Newport, Oregon, conducted a demonstration program which addressed questions about port refuse disposal facility needs especially for fishermen and boaters, costs and cost recovery, and mariner education. A report, a detailed reference guide, and a videotape summary resulted from that pilot program and are available through the Marine Debris Information Offices, NOAA.

Work was begun in November 1988 to apply the findings of the demonstration project to ports and fishing groups on the west coast of the United States. It continued through June 1990. This work was coordinated by the Pacific States Marine Fisheries Commission with funding from a Saltonstall-Kennedy fisheries development grant. Various methods were used: Ports and fishing groups were sent written information and educational resources, marine debris exhibits were featured at trade expositions, and workshops and seminars were conducted with port groups, extension agents, and educators. Additionally, eight target ports (two in each of the west coast states) were visited periodically to provide them with direct assistance in assessing their refuse disposal needs and options, enlisting local mariner support, and encouraging community awareness. Targeted areas were chosen with the help of the commercial fishing industry and the Sea Grant marine agents. They were areas with active commercial and recreational fishing activity where need was shown and mariner and port support was considered likely. These port areas will in turn serve as examples for and be able to assist surrounding areas on the basis of their experiences. The target port areas were Petersburg and Homer, Alaska; Anacortes and Westport, Washington; Astoria and Coos Bay, Oregon; and Eureka and Morro Bay, California.

This paper will summarize the findings of the pilot port program. It will then mention what has been learned in applying the pilot project experiences to other port areas on the west coast of the United States.

PILOT PORT PROJECT SERVES AS MODEL

While no port is likely to be thrilled with the news that it is legally obligated to accept refuse from vessels, pilot project experiences indicated that ports can benefit by examining and improving their refuse handling system and by becoming involved in educating their customers about the marine debris problem. Some of the positive results of the Port of Newport pilot project were:

- a high and voluntary (Annex V had not yet been implemented) return of refuse back to shore;
- reduced port refuse disposal costs, despite the much-increased volume of refuse being returned;
- an improved rapport of the port with the fishing community;
- the pride of ownership mariners, port workers, and community members felt in the project; and
- frequent, positive media attention focused on the port and fishermen's efforts.

The acceptance and continuity of the marine refuse disposal project at the port resulted from:

- the convenience and comprehensiveness of the refuse reception facilities;
- the use of a simple, low-cost recycling system which reduced refuse disposal costs and port labor involvement;
- port management and worker support for recycling efforts; and
- fishermen's cooperation with port refuse and recycling efforts.

The support of commercial fishermen and other mariners for ocean cleanup efforts and for increasing community awareness of the marine debris problem resulted from:

- involvement of respected mariners and community members in the project advisory group and their willingness to take an active role in promoting awareness among their peers;
- direct contact with mariners, port workers, and community members (such as is achieved by conducting an oral survey, asking for ideas about improving the refuse system, or by organizing a beach cleanup) as a means of provoking thought and creating a sense of involvement;
- the widespread dispersal of a variety of educational and promotional materials such as brochures, decals, posters, displays, and slide and videotaped shows; and
- frequent local media reports of port, mariner, and community efforts to deal with the marine debris problem.

In work with other ports these approaches are emphasized and have been found to be generally adaptable.

APPLICATION OF PILOT PROJECT FINDINGS TO OTHER PORTS

The pilot port project differed from the situation to be encountered in most ports. The pilot project provided both focus and funds for marine debris work at the Port of Newport, minimizing port risk and financial restrictions and allowing the hiring of a full time manager, who was able to concentrate solely on marine debris work and plan and implement activities related both to facility development and education.

Though Annex V implementation might focus port attention on refuse facility work, ports we have seen seem generally unconcerned about this regulation's enforcement and have not made compliance a high priority. Most have not planned or budgeted for refuse system changes, nor assigned anyone to be in charge of carrying out necessary work. An active role in mariner and public education has not been considered by most ports.

What then of the Newport experience can be applied to other ports? Can the factors that made Newport's project successful--the convenient and cost-effective refuse disposal system which emphasized recycling, the mariner cooperation and support, and the community involvement--be counted on in other areas? What changes have been observed in work with ports that differ in physical size and layout, types of vessels and clientele served, type of equipment and services offered, and political organization?

Beginning Work With a Port

Given the general willingness of a port to look at its refuse handling situation in light of Annex V, the approach of holding a meeting to bring together the port, mariners, and refuse handlers has been found to be applicable and effective. Though it is unlikely that such a meeting will be initiated by either the port or the mariner group, we have found it easy to arrange by initiating the idea with these parties and asking the Sea Grant marine agents (or other community organizers) for help in identifying and inviting participants, arranging meeting facilities, and helping to moderate the discussion. The preliminary meeting is used to inform participants of the marine debris problem and the applicable laws, encourage the discussion of refuse service needs and options, and plan the necessary improvements.

In order to encourage the port to commit to making changes, it is important that mariner concern about the issue be evidenced by attendance at the meeting and participation in discussions. Mariner input to the port can be obtained at the meeting if the moderator will ask specific questions to draw out mariner discussion. It may be important for the moderator to discuss needs, ideas, and problems with mariners beforehand in order to foster honest discussion. The advisory group, if one can be formed, or an interested mariner group will need to follow through and continue to encourage the port to accomplish the suggested changes. While we have found that fostering the formation of an active advisory board is difficult unless a specific marine debris or solid waste project is defined, it is not an impossibility if a local person takes the initiative to keep things going, define a role for the advisory group, and call the meetings.

It is also effective for the moderator or a port official to ask about resources or specific commitments from the refuse haulers or recyclers at this preliminary meeting. (For example, What size bins can you provide? How frequently will the containers be emptied?) However, even with these details worked out, it is imperative that someone at the port be assigned to follow through to make the necessary arrangements.

In ports where either the port or the refuse service is operated under the jurisdiction of the municipality or city, special attention needs to be paid to informing these entities of mariner needs. City managers, engineers, and public works employees should be involved in the preliminary meetings with mariners and port officials in order to avoid subsequent problems and misunderstandings.

Gaining Port Interest

The attitude and interest of the port or dock manager or harbormaster regarding the marine debris problem and the new law will be the key determinants of progress regarding port refuse facility needs.

Many ports consider themselves to be already providing adequate refuse reception facilities, even though dumpsters may regularly overflow or be inaccessible, and mariners have no place to dispose of large refuse items. These ports need to be "pushed." That push can come from a manager who becomes especially interested in this marine debris issue. It is not uncommon to find such people, especially when the potential for more efficient refuse service and improved port-customer relations become apparent. Interested managers have quickly influenced change by establishing informal refuse reception areas (i.e., by beginning piles for wood, metal, and net), by speaking to mariners about new laws and port plans, by increasing the size of refuse containers, by pursuing recycling options, by including plans for marine debris facility improvements in their grant applications, and by encouraging education about marine debris in public schools.

We have found port and harbormaster groups quite interested in having their members informed of the new laws, refuse handling options, and available resources, and have found them quite willing to distribute written information and promotional materials to their members and arrange for presentations before their groups. We have also found harbormasters involved in marine debris work willing to share their experiences with their peers at port association meetings. These short presentations are extremely influential and generate many "hands on"-type questions, result in new cost-saving ideas, and foster a positive attitude toward attempting refuse system changes.

The biggest stumbling blocks we have encountered are not technical or financial, but attitudinal and political: managers who care only to meet the letter of the law, or who are unconcerned with user relations; city and port tensions that restrict port autonomy and the ability and willingness of the port to make financial commitments or changes or to solve problems (e.g., lack of cooperation between city and port in prosecuting the non-mariner citizens who use port dumpsters).

Assessing a Refuse System for Adequacy and Convenience

Analysis of the existing refuse handling system and port layout is useful in identifying problem areas and needs specific to that port's situation. It is important to critically examine refuse can or dumpster placement (for convenience and visibility), refuse container capacity, and emptying schedules to identify their adequacy in serving mariners and in handling refuse loads especially during the high-use times. The availability of carts, hoists, and forklifts for moving refuse may also be a determinant of convenience.

A one-time walk-around assessment is not adequate, however. Observations must be made during the various busy seasons of the port and these observations should be "reality checked." Resident mariners and port workers can be valuable resources for determining problem areas and times, but only if specific questions are asked. "When do refuse containers overflow and where?" gives much better information than asking, "Is the refuse system adequate?" It is also important to observe what mariners or the port actually do, despite what one might be told. For example, if a refuse container is located far from the access ramps to the vessels, notice whether the mariners actually use it, even if the port or mariners themselves report that they do.

Negotiating Refuse System Options

Often better service, additional service, and lower costs can be negotiated in port meetings with refuse haulers. In Astoria, Oregon, the port meeting with refuse company officials resulted in the willingness of the refuse hauler to back farther out on the dock to service a container. The Petersburg, Alaska, harbor district, under city jurisdiction, is meeting with city officials, who also operate the refuse service, to negotiate charges to account for the dumping of household refuse in port containers and for emptying half-filled dumpsters.

Determining Whether Recycling Will Work

A recycling system is a viable and cost-saving option for ports in which the following conditions exist:

- Ports are convinced that there are substantial benefits to recycling: recycling saves them significant refuse disposal costs, expands their refuse reception capacity, or provides a welcome service to mariners.
- There are operating recycling systems in the area and nearby markets for recycled goods. (If markets are far away, recycling is still a possibility if nonprofit groups can arrange with shipping companies to waive their backhauling charges.)
- Recyclers or community organizations will come to the port to haul away the collected materials without port involvement.

(Ports generally have shown little interest in collecting recyclables if they must also haul them away.)

- Port concerns about recycling can be addressed. Lack of familiarity with recycling, concern about system efficiency, and uncertainty about recycling markets are deterrents to port recycling interest. Ports need to be assured that the materials they accumulate will not be difficult to get rid of. Ports need to be willing to experiment with recycling.
- Recycling provides mariners increased convenience and benefit. Mariners will use recycling areas if they are provided at the point of disposal and if they are clearly signed. It helps if mariners are familiar with a recycling system or concept (e.g., fishermen in Coos Bay, Oregon, were aware of the Newport system; cardboard was already being recycled in the town of Bellingham, Washington).

Anticipating Recycling Potential and Possibilities

Refuse container contents can be examined and mariners queried to determine the types of waste materials generated and the potential for cost savings through recycling. Speaking to mariners will also indicate their level of awareness about recycling and their interest.

Visual examination of refuse container contents from port to port indicates that the amounts of metal, wood, paper, glass, and gear items found are quite variable. However, we have found that most all commercial fishing ports examined to date could realize cost savings by collecting and separating cardboard items for recycling. The recycling of this item is an easy and impressive first step and may stimulate further interest in recycling. (This was Newport's experience as well as that in Coos Bay, Oregon, where the harbormaster noted with much enthusiasm, "It works!")

In most ports serving the larger commercial fishing vessels, the establishment of a central area to both collect and store wood, cable, metal, and net items (for recycling or giving away) can provide a convenience to mariners and also encourage the proper disposal of particularly large items. Ports have often started these areas informally by stacking materials on pallets or in old containers, or by simply making distinct piles of different types of materials and posting signs. All those that have done so are impressed by how quickly additional materials get placed on the piles by mariners. Even hand-painted signs are effective in encouraging the proper sorting of refuse items. Ports that serve a primarily recreational vessel fleet will probably not find a need for such a central area, unless infrequent pickup of recyclable materials necessitates storage.

We have found that wherever there has been an established recycling program in a local area, it is relatively easy for the port to tie into it. Port contact with the recyclers has always resulted in their willingness to cooperate with the ports in establishing a workable recycling system and hauling schedule. Recycling containers need not be elaborate or expensive

and can usually be built by the port or acquired. Refuse or recycling companies often provide free recycling bins, while donations of the bins can often be obtained from local businesses, from a city (e.g., they may have surplus bins), or from restaurants (208.2-L (55-gal) drums). School shop classes may also be willing to fabricate them. Ports may find it awkward to ask for such donations, and such requests may be easier and more effective if they come from a local mariner or a citizen.

Recycling containers must be able to be emptied easily by the recycler and must be clearly designated so as not to accumulate trash. Bright colors and clear signage are essential. The color blue is being used by most west coast ports for their recycling containers, with the idea that coast-wide consistency will make mariner recognition easier.

Seine and trawl nets are in demand by fishermen and the general public and will be removed from an accessible collection area if it is signed.

Though nets are made of materials with recycling potential (nylon, polyethylene, and polypropylene), used-net recycling efforts are still experimental in nature in the United States, and the details of collection, transportation, and market value of the nets are still undetermined.

At least 20 ports on the west coast have begun recycling programs. Table 1 summarizes these efforts.

Beginning a Port Recycling Program

Though ports may not set up a recycling system on their own, most welcome assistance in getting one started. The following steps are usually followed to establish a recycling program:

1. Assess refuse materials generated at the port.
2. Determine which materials are accepted or collected by area recyclers.
3. Explore demand and markets for uncollected but recyclable goods, e.g., fish nets.
4. Work with mariner groups and port to design a system that will be utilized.
5. Order or make recycling signs.
6. Order or make recycling bins or designate reception areas.
7. Implement the recycling plan, placing signs and bins.
8. Inform mariner groups of the bins and encourage their proper use. Inform the media.

Table 1.--West coast port recycling systems.^a (Note: Used oil is also recycled at all these marinas.)

Port and contact	Type of materials collected	Collection methods	Other notes
Newport, OR Bud Shoemaker (503) 265-7758	Cardboard, metal, wood Troll wire Metal, cable, wood, nets	Wood fish bins 208.2 L (55 gal) barrel Reception area, barge	System's 3d year Compounds/screens Refuse volume reduced one-third.
Charleston, OR Don Yost (503) 888-2548	Cardboard, metal, wood Cable, nets	Wood fish bins Reception area	8 h/month labor saves \$200/month due to cardboard reduction alone.
Astoria, OR Bill Cook (503) 325-8279	Cardboard, metal, wood Cable, nets, some plastic	Reception area Reception area	New refuse area Completed December 1989.
Westport, WA Karl Wallin (206) 533-9528	Cardboard, plastic, lines Glass, cable, nets	Wood fish bins Wood fish bins	System in place October 1989 Located dockside and near office, launch ramp, net repair.
Anacortes, WA Dale Fowler (206) 293-0694	Metal, cable, nets, wood	Reception area	Got free advertising of net availability.
Bellingham, WA Art Choat (206) 676-2500	Aluminum, cardboard Wood, metal, nets	Wood fish bins Reception area	Recycling project assisted by Washington Sea Grant.
Friday Harbor, WA Bart Mathews (206) 378-3688	Glass (white, brown, green) Aluminum	Commercial 15.3 m ³ (20 yd ³) recycling bin, provided and hauled by garbage company	Recycling system so well-used had to enlarge and automate system.

Table 1.--Continued.

Port and contact	Type of materials collected	Collection methods	Other notes
Everett, WA Karen Bukis (206) 259-6001	Cardboard, aluminum, mixed paper, glass plastics (in 1991)	208.2-L (55-gal) barrels obtained from yogurt company for \$8 each	Three barrels in each of 13 loca- tions. Started April 1989, in first 10 months recycled 2,270 kg (5,000 lb) paper, 1,816 kg (4,000 lb) glass, 454 kg (1,000 lb) aluminum. Garbage bill reduced \$7,500 from previous year.
Ilwaco, WA Bob Petersen (206) 642-3144	Aluminum cans Nets, cable, wood, metal	Wire mesh cans Reception area	Cans benefit baseball team.
Port Townsend, WA Andrea Fontenot (206) 385-2355	Cans, papers, glass	113.5-L (30-gal) garbage cans	Five roofed "environmental centers" built summer 1989. Part of water- front revitalization plan.
Seattle, WA Marla Kleiven (206) 728-3394	Glass, aluminum, newspaper	208.2-L (55-gal) drums	In 11 cedar-fenced refuse areas at recreational marina.
Greg Money (206) 728-3395	All types recyclables, including plastics, paper	3.1 m ³ (4 yd ³) dumpster	Three locations at commercial fish- ing marina for comingled materials. Port pays to have hauled but less than for trash.
Sequim, WA Jan Hardin (206) 683-9898	Cardboard Glass, aluminum	Wood fish bins Wood fish bins	In place Planned for 1990.
Half Moon Bay, CA Bob McMahon (415) 726-5727	Cardboard, paper, glass Plastic jugs, aluminum	Rubbermaid 2-wheeled 208.2-L (55-gal) carts, transferred weekly to storage bins	Pilot study by Coastal Resources Center. Handbook available December 1990 from (916) 323-3508.

Table 1.--Continued.

Port and contact	Type of materials collected	Collection methods	Other notes
Oakland, CA area ^b Calvin Young (415) 891-3912	Aluminum, glass, plastic beverage bottles	Mini-house structures contain two 208.2-L (55-gal) barrels. PVC tube prevents removal of deposited materials	Materials for each of 27 units cost \$200. Emptied twice/week even in winter. In operation since April 1989.
Kodiak, AK George McCorkle (907) 486-5438	Aluminum, plastics/rubber Wood, metal, nets/rope Paper/cardboard Batteries	3.1 m ³ (4-yd ³) dumpsters Separate collection area	Seven dumpsters in each of two MARPOL stations. Operating since February 1990.

^aOther systems planned: Santa Cruz, CA, Steve Scheiblaue (408) 475-6161; Chula Vista, CA, Becky Clark, 550 Marina Parkway, Chula Vista, CA 92010; San Diego, CA area (a number of marinas); Libby Lucus (619) 235-0281; Edmonds, WA, Bill Stevens (206) 457-4505; Port Angeles, WA, Chuck Faires (206) 457-4505; Crescent City, CA, Rich Taylor (707) 464-6174.

^bSix marinas.

9. Monitor the recycling system to make sure materials are hauled on time and problems are resolved.

The Port Role in Mariner and Community Education

Most ports will play a limited but important role in stimulating mariner awareness and involvement in the marine debris solution. Ports welcome and even solicit help from mariner groups, community groups, and recyclers to inform mariners of the refuse disposal law and to stimulate interest. The ports are willing to make notices about the law available to mariners and, when they are provided, will display posters and distribute stickers and brochures. A limited number of ports, fish processors, and dock facilities actively seek out information to pass on to mariners.

Ports may be willing to meet with their user groups to discuss Annex V regulations, but they are not likely to coordinate or organize such meetings on their own. Likewise, though most ports welcome press coverage about their marine debris efforts and do not object to public service announcements that say "brought to you by your local port," they are not likely to seek out media contacts.

A few interested harbormasters have actively sought support for marine debris cleanup efforts. The harbormaster in Petersburg, Alaska, spent a whole day going from boat to boat to explain the law to mariners and his need to raise moorage rates in anticipation of the extra refuse load. The harbormaster in Astoria, Oregon, showed marine debris promotional materials to a solid waste committee. He has asked for their assistance in contacting mariners on the docks and has inspired them to go into the schools to inform children. In Avila Beach, California, the port manager, a former teacher, is developing a marine debris educational package for school children.

Fishing Industry Support

Our experience shows that support from commercial fishing groups can be expected. Fishing industry groups are interested in solving the marine debris problem and are willing to become involved in marine debris work.

When supplied with information about Annex V, industry groups and Sea Grant marine agents will promote awareness of the issue through newsletters. They will discuss the regulations at fishing group meetings and encourage affirmative action among members. Industry groups have also been willing to promote marine debris awareness at expositions by handing out materials, displaying posters, talking with mariners, and by making display space available for marine debris pictures.

When prompted or during a meeting, fishermen as well as Sea Grant agents are willing to talk to their port harbormasters about refuse disposal needs and ideas. Many individual fishermen have personal interest in this issue, and their support is an essential factor influencing the attitudes of others, promoting peer action, and pushing for port changes. Some fishermen, when provided information and promotional items may also

act on their own to bring this material to the attention of their peers, other mariner groups, and the schools.

Taking Action

Action related to the marine debris problem is unlikely unless someone takes charge. Someone must define and plan activities that address the marine debris problem, must organize and facilitate meetings, and must delegate the work. Do not assume that a port employee will take on or be assigned the lead role. If that level of involvement is not likely from the port, look for other individuals and groups for the port to work with.

Groups that have already been organized around beach cleanups or recycling are logical groups with which to work. They may be able to research or put together a port recycling program, coordinate a special promotional event, conduct mariner surveys, or organize a harbor cleanup or educational campaign. They are often willing to distribute information and show readymade video tape or slide presentations. The reference guide resulting from the Newport pilot project outlines such an outreach program, and emphasizes approaches such as involvement of port employees and mariners in program design and trouble shooting. This involvement has been effective in assuring the support of a marine debris program.

Groups already taking part in boater education efforts (e.g., the U.S. Power Squadrons and Coast Guard Auxiliary) can also provide support. They may be willing to incorporate marine debris information into their classes and during their contacts with mariners.

Other groups which may be interested in marine debris cleanup and recycling activities are environmental groups, community, senior, and scouting groups, and school science classes. They are most likely to act when they have readymade materials to give out or use. Interest and action are encouraged simply by making brochures, stickers, posters, curriculum materials, photo displays, and slide or video programs available to groups and teachers.

CONCLUSION

The technical part of dealing with marine refuse in a port is usually simple. Refuse containers are readily available in various sizes, hauling schedules or container sizes can be adjusted to meet increased demand, and recycling can often be used to decrease refuse disposal costs.

What is difficult is the initiation of action. What has been most apparent in work with the eight target ports, and with other ports on the west coast, is that while there is general support and interest by the port and mariner groups in the marine debris problem, it is not a high priority action item.

Most ports and mariner groups are not likely to take action on their own. However, if ports are approached, offered assistance, and encouraged (even by providing a simple catalyst such as information, notices, posters,

or brochures) much can be accomplished. All ports have been willing to attend and even help organize meetings which bring them together with mariners, refuse haulers, and others. Once port officials are stimulated to begin (by the development of personal interest, by gaining the tangible assistance of supportive mariners or community groups, by guilt, or by seeing the examples set by other ports) we found that many then initiate activities on their own.

This essential outside push can be provided by a mariner, citizen, recycler, or community group willing to do some research regarding refuse and recycling options, organize meetings or activities, and encourage the awareness of mariners. States, counties, and cities may be able to designate part of an employee's time for such port assistance through their solid waste, environmental quality, boating, or fishing departments. If such a person can organize the readily available assistance of the fisheries groups and the ports, tangible progress on the marine debris problem will soon be noted.

Further information on the NMFS-sponsored pilot port marine debris project is available in two reports: "Report on a port-based project to reduce marine debris" and "Dealing with Annex V--reference guide for ports." The former report describes the project in detail. The latter presents guidelines and resources that resulted from the pilot project. A video tape about the Newport project called "A marine refuse disposal project" has also been completed. All three resources are available from NOAA's Marine Debris Information Office, 1725 DeSales Street, N.W., Suite 500, Washington, D.C., 20036, U.S.A., phone (202) 429-5609.