

VIRGINIA BEACH

# BEACH MANAGEMENT PLAN

APRIL 2002

**BEACHES AND WATERWAYS**  
ADVISORY COMMISSION



# VIRGINIA BEACH BEACH MANAGEMENT PLAN

PREPARED BY:

**BEACHES AND WATERWAYS**  
ADVISORY COMMISSION



APRIL 2002

**BEACHES AND WATERWAYS  
ADVISORY COMMISSION**



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# INTRODUCTION

On May 23, 2000, the City Council of Virginia Beach by ordinance established the Beaches and Waterways Advisory Commission as the successor to the Erosion Commission. The purpose of the Commission is to serve in an advisory capacity to City Council with respect to Beach and Waterways issues.

The inaugural meeting of the Beaches and Waterways Advisory Commission was held on July 24, 2000 in the City Council Conference Room at City Hall. At the City Council meeting on August 22, 2000, Council formally referred the task of revising the Beach Management Plan to the Beaches and Waterways Advisory Commission.

The plan to be revised was drafted in January of 1993. The original Beach Management Task Force was comprised of members from Public Works, the Wetlands Board, the Erosion Commission, Parks and Recreation, Convention and Visitor Development, the Office of Management and Budget, Planning, the Resort Area Advisory Commission and the Executive Office. The former task force was asked to examine the present system for managing our shores and beaches, and to make recommendations for improvements where indicated. Specifically, their objective was twofold: the preparation of a comprehensive Beach Management Plan for the City of Virginia Beach; and the identification of a dedicated funding source to provide for implementation of the Plan.

It was acknowledged that one of the 1993 draft report's shortcomings was the extensive nature of the recommendations and the lack of public input. Approval of the 1993 Plan would have authorized a wide variety of implementations which had not been coordinated with the impacted communities. The most contentious of the draft report's recommendations were related to increased public access and the creation of public beach use facilities. Another technical shortcoming of the draft report was felt to be an inadequate linkage of our inlet maintenance programs to the beach replenishment and maintenance efforts. Finally, it was the opinion of City Council that the draft funding recommendations were not fully sensitive to Council's concerns.



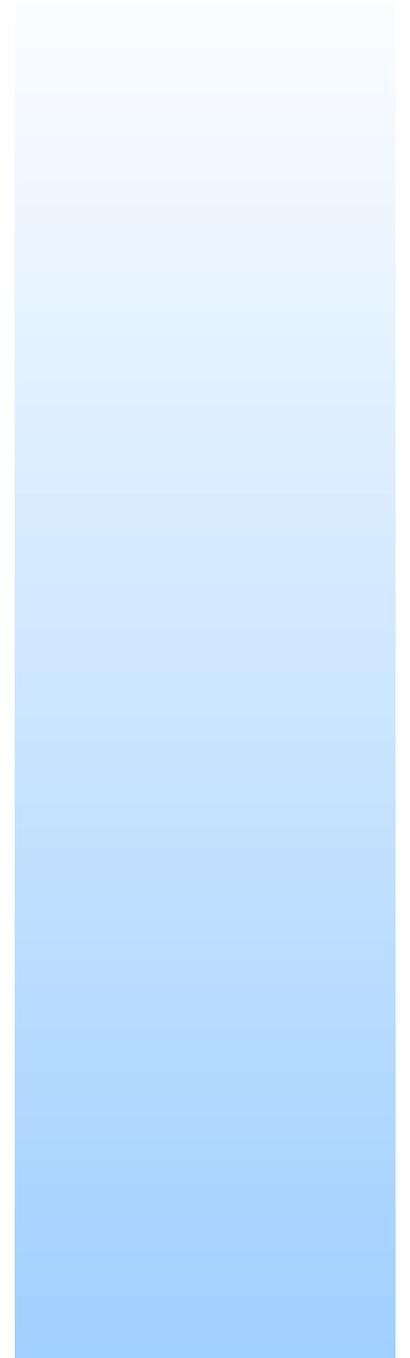
As the Beaches and Waterways Advisory Commission began its assignment of revising the 1993 draft plan, it was mindful of the need to address the concerns listed above which effectively caused the former plan to be “dead on arrival” at Council. Its first step was to visit the neighborhoods that adjoin the beaches to be managed and to open dialogue with the communities that would be affected. The following plan has been arrived at with substantial input from the citizens of the City of Virginia Beach, City Staff representing many different departments and the efforts of the Commission. The civic leagues that represent the neighborhoods most likely to be impacted by changes to the current beach management program have been very active in the shaping of this plan.

The principal strategy used in arriving at the Beach Management Plan was to segment the City’s coastline into eight individual beach units and the two operating inlets. Each individual beach segment was analyzed from the position of its strengths, weaknesses, opportunities and needs. The inlets were analyzed with respect to their positive benefits and negative impacts on the beaches that abut them.

This revised Beach Management Plan is intended to address and highlight issues from a citizen’s perspective and on the citizens’ behalf. Rather than an engineering document outlining project specifics, implementation methods and organizational issues; the Plan recommends leaving those details to the professional Staff upon adoption by City Council.



# BEACHES AND INLETS

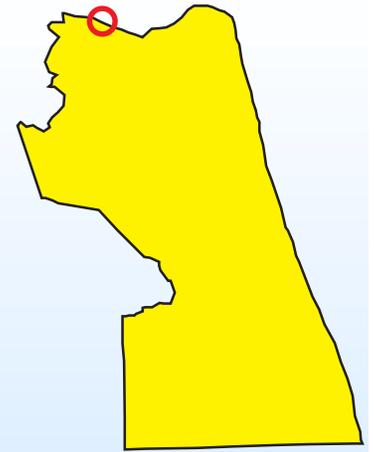


# CHESAPEAKE BEACH

Chesapeake Beach is the one-mile stretch of beach that extends from the border with Little Creek Naval Amphibious Base on the west to Joyce Avenue and Baylake Pines on the east. Characterized by densely developed modern beach-style residences, blended with older single-family residences and bungalows, and interspersed with light-commercial development, Chesapeake Beach can be described as an urban beach community. Residents enjoy neighborhood stores, a range of dining opportunities, mature trees and development, and a strong sense of community; all within walking distance to the beach.

The beach, however, has suffered from chronic erosion and is now in dire condition. Though erosion rates at Chesapeake Beach are relatively low as compared to our Atlantic coastline, decades of relentless shoreline erosion have largely depleted the beach and exposed development and public infrastructure to storm damage. Most of the beachfront properties have been bulkheaded against storm damage, in some cases to no avail. Damages from erosion and storm conditions to dwellings and public infrastructure have increased in recent years, and are now annual events.

The fundamental issue preventing any form of public beach nourishment or restoration at Chesapeake Beach to address the erosion is the claim of private beach ownership by the bayfront property owners. The early subdivision plats for this community indicate private ownership across the modern beach and out beneath the Chesapeake Bay; entire platted blocks exist beneath the bay's waters. Most individual lot owners with portions of platted land extending northward onto the sandy beach claim ownership of the beach. Partnerships and land speculators with deeds to entire underwater blocks and streets appear to be awaiting natural accretion to recreate developable land. The issue is deeper than a simple lack of agreement over the validity of the claims; the deed holders seem adamant and less than a majority have indicated a willingness to clear the way for public erosion control assistance through the dedication of easements to release their claim.



*Beach ownership issues*

*Beach restoration and replenishment needed*

*Beach access at every street*

*Good family beach (bay beach)*

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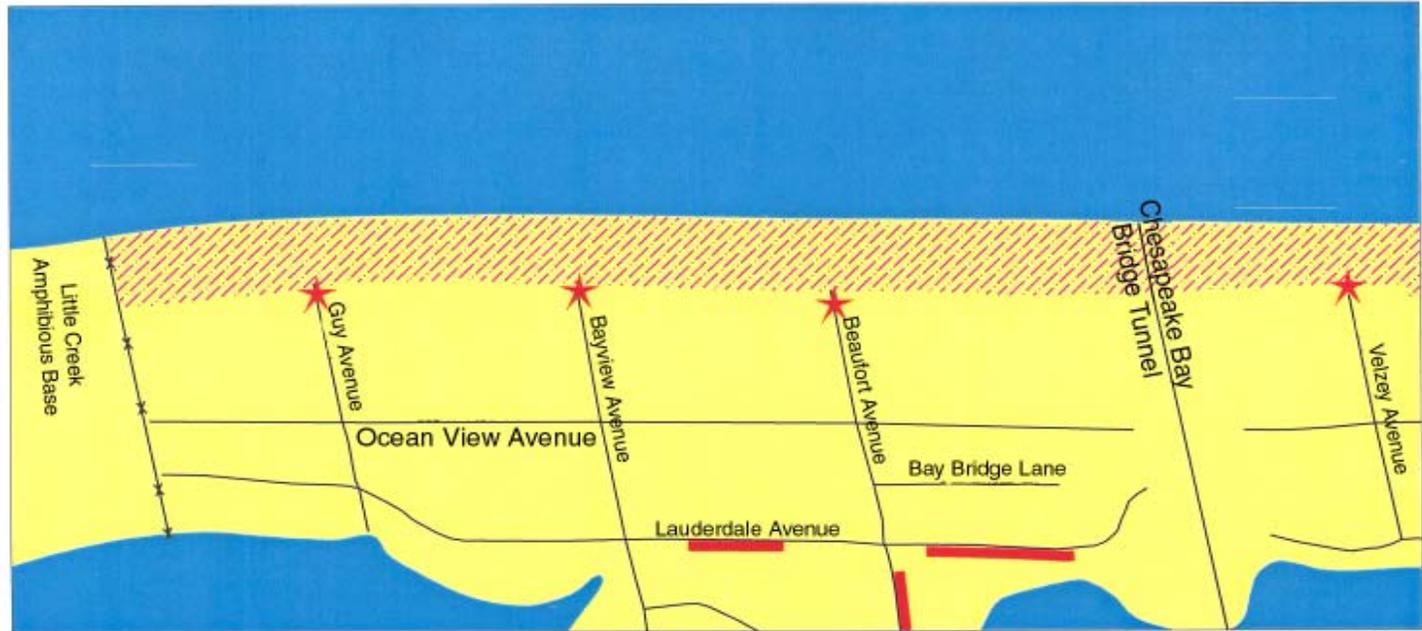
Mature trees and neighborhood



Family playground



Dog walking - a popular Chesapeake Beach activity



### Public Parking

On-street parking is limited, though a few spaces are available within walking distance to the beach. Due to the narrowness of the community roadway system, there is little room for improvements to increase available on-street parking. Likewise, as a mature and long-ago built-out community, there does not appear to be an opportunity for the development of a public parking lot. As with the other Shore Drive beach areas, access from a Shore Drive parking facility via public beach transit may be a future possibility.

### Beach Access

Marked and developed beach accesses exist at:

- Guy Avenue
- Bayview Avenue
- Beaufort Avenue
- South side of Chesapeake Bay Bridge Tunnel
- Velzey Avenue
- Fentress Avenue
- Seaview Avenue
- Mortons Road
- Lee Avenue
- Joyce Avenue

These accesses range from street-end sandy paths to the beach to fully developed timber walkways and access stairs bridging existing bulkheads. The timber access stairs have suffered repeated damage, some dune crossing accesses in the west end of this beach require periodic grading; repair by City forces is an annual event. Access signage is in need of updating and enhancements in accordance with a new City standard for both signage and access ways recommended in this report.

### Recreation

The issue of sail craft storage on the Chesapeake Beach has created some concern from area residents. One method of addressing this concern may be to consider a system of sail craft permitting, similar to the program in place for the North End. Jet skis also present a concern and issue for many area residents. The use of the beach for launching and landing of the craft creates conflicts with beach users, and the noise created by the jet skis is of concern. Lifeguards are not present at this beach.



Low energy waves



Looking east - August 2001



Dunes at the west end

### Beach Nourishment

A program to address and control erosion along Chesapeake Beach is long overdue, the state of the beach is extreme; damage to dwellings and public infrastructure has increased in frequency and cost. There are several viable project and program formulations for a long term erosion control at Chesapeake Beach: sharing in inlet dredging sand; a Section 933 project involving low cost placement of beach quality sand dredged from the Thimble Shoal and Atlantic Ocean Channels; or, truck hauling from interior borrow pits. Costs for beach restoration and nourishment for Chesapeake Beach would be relatively low when compared to our ocean beaches, owing to this area's shallow and extensive nearshore and relatively low wave energies. Though an initial beach restoration project involving a relatively large volume of sand would be necessary, a program to maintain the restored beach through periodic nourishment would be modest.

### Beach Title Issues

The subdivision plats of Chesapeake Beach encompassed land which is now subaqueous. Bayfront property owners whose platted boundaries extend across the beach, and land speculators who have deeds to portions of the beach and entire subaqueous blocks, claim ownership of this beach resource. Notwithstanding the occasional and offensive private signage to the contrary, the public has enjoyed full use of this beach for many years. The claim of private ownership, however, will prevent the expenditure of public funds to address beach erosion until such a time as the public's interest in the beach has been established.

### Beach Maintenance

Litter receptacles are provided at each beach access, and are emptied daily during the summer months. Litter collection continues year round, though reduced in scope during the winter months. Beach grooming activities for this beach are modest and typically limited to once or twice a year in the winter months.



Narrow beach at high tide

# CHESAPEAKE BEACH

## Recommendations

### *Top Priority*

Because of the critical need for beach restoration to reduce storm damage, protect property, and reestablish a healthy recreational resource, resolution of the beach ownership issue at Chesapeake Beach is the Beaches and Waterways Advisory Commissions highest priority recommendation, citywide. A documented public interest in the beach is an essential prerequisite to any form of public participation in the beach restoration project. It is recommended that City Council establish the authority for staff to accept voluntary public beach construction and recreation easements in the general form as those utilized in Sandbridge. Because of the benefits derived to all of our citizens by protecting this shoreline, City Council is urged to consider authorizing any means necessary to create or document the public's interest in this beach to facilitate its restoration.



Alexander's on the Bay parking lot

Once the beach is clearly documented as being public, the Commission's second highest priority is to embark on a beach restoration project and a long term beach replenishment program for Chesapeake Beach.

### *Moderate Priority*

Additional, but appropriate and sensitive to the community, opportunities for on-street parking should be explored to better distribute parking availability throughout the neighborhood. Signage and architectural improvements to the existing beach accesses are also recommended in accordance with the new standards stated in this report.



Looking west - February 2002

It is also recommended that the City adopt an ordinance to regulate sail craft on the beach in the same manner as the North End beaches. Finally, once clearly established as a public beach, additional beach maintenance activities are recommended in accordance with the new program outlined in the Overarching Issues section of this report.



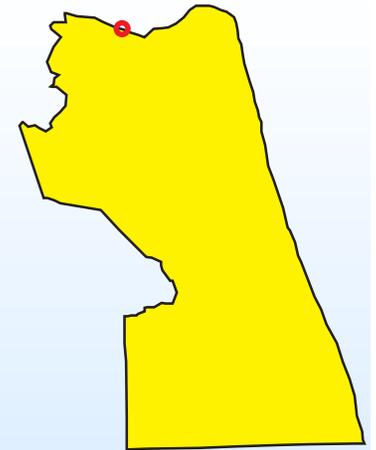
# BAYLAKE BEACH

Baylake Beach fronts the quiet beachfront community of Baylake Pines. This 1900-foot long beach is family oriented, enjoyed almost exclusively by the neighborhood residents. The neighborhood is uniquely characterized by its suburban style lot sizes and architecture, offering both beachfront and lakefront homes with ample outdoor space.

Situated at nearly the midpoint between Little Creek and Lynnhaven Inlets, this area of beach is relatively stable from an erosion perspective and boasts a small system of dunes. The slightly accretional and southerly migrating dune system has created circumstances where the dunes have encroached on private development, prompting the residents to seek authority to move or reduce the dunes to preserve vistas and the continued use of developed, private land.

The exclusive and quiet nature of this beach is due primarily to two factors: on-street parking near the beach is very limited, and the neighborhood subdivision documents have perpetuated a belief that the beach is reserved as a common area for only the residents and owners of property within the subdivision. Accordingly, public beach visitation impacts on the neighborhood have been very low.

Though the use of public funds for trash collection from the beach, removal of flotsam and periodic beach grooming are minimal, resolution of the public's right to access and use of this beach would be essential to any proposal for beach nourishment or beach access improvements.



*Beach ownership issues*

*Relatively stable beach*

*Limited impact to residents from visitor parking*

*Good family beach (bay beach)*





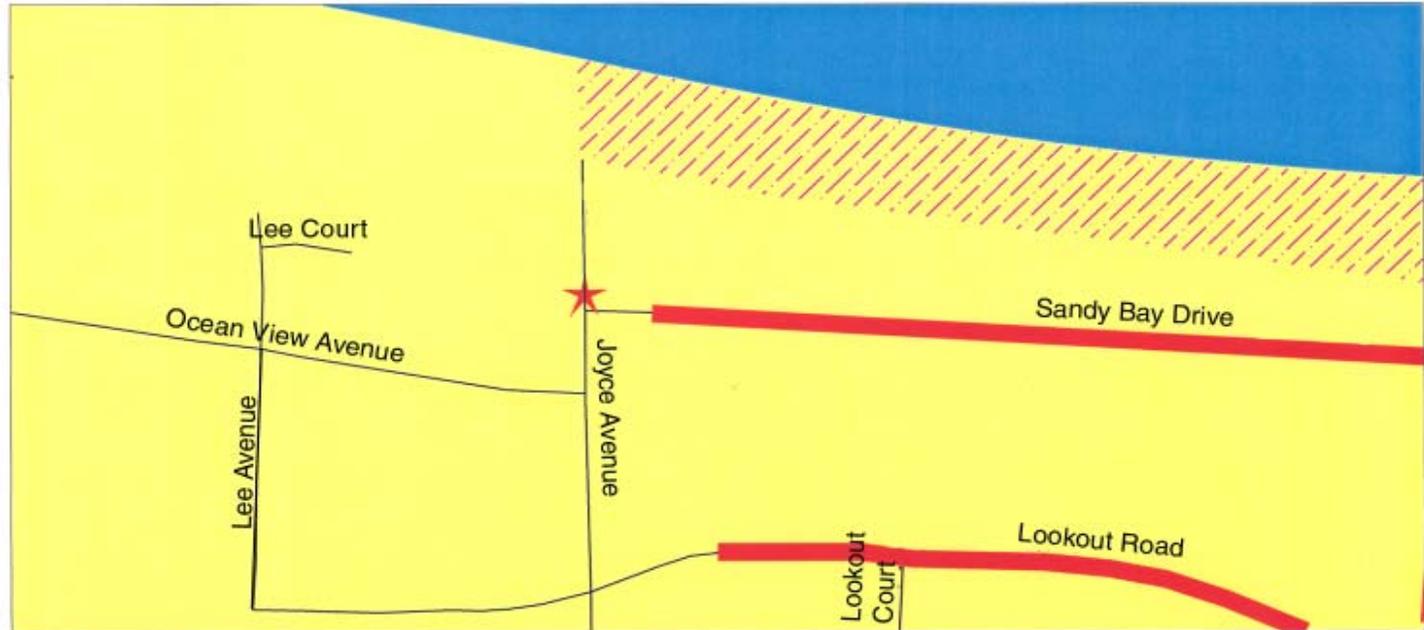
Joyce Avenue public beach access



Sandy Bay Drive



Dune system at east end



### Public Parking

On-street parking for public beach access is extremely limited. Some opportunities may exist to enhance on-street parking by piping roadside ditches and improving streets with curb and gutter. There does not appear to be an opportunity for the development of parking lots within this community, though access from a Shore Drive parking facility via public beach transit may be a future possibility.

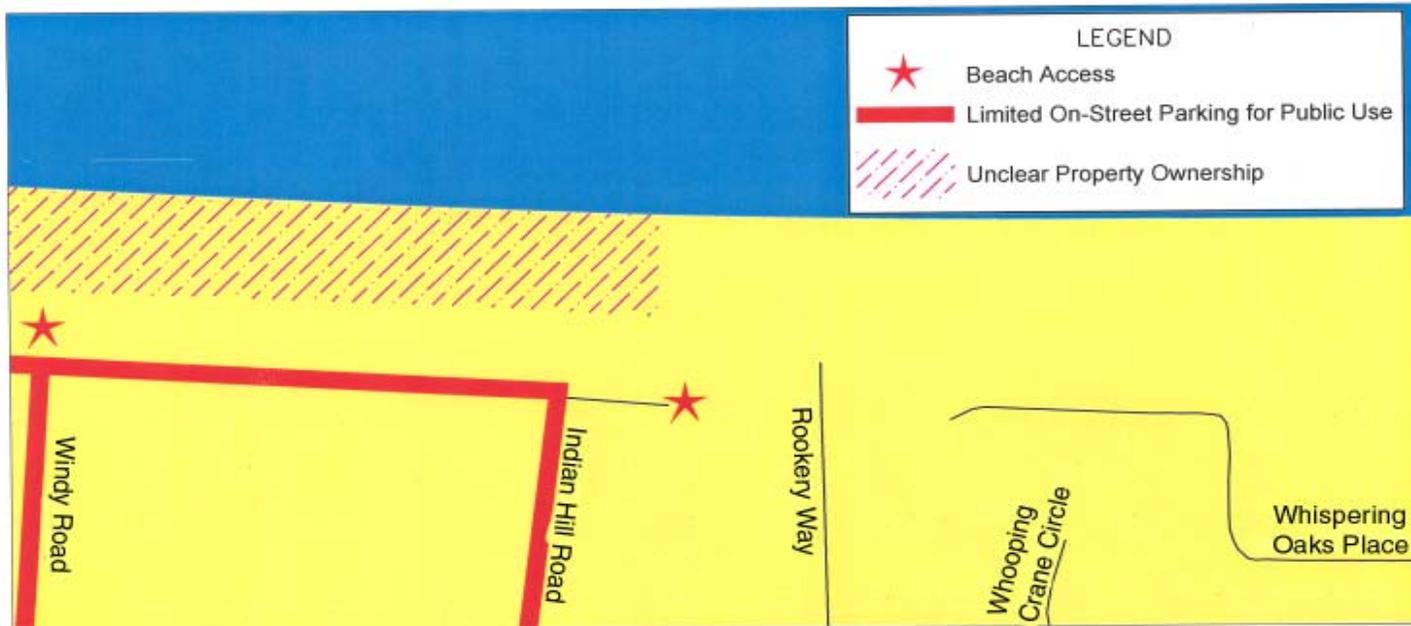
### Beach Access

- Joyce Avenue
- Windy Road
- East end of Sandy Bay Drive

The three existing accesses appear to be sufficient for this 1900-foot long beach. The condition of the accesses is generally good, maintenance has generally been provided by the community with occasional assistance by Public Works. Access signage is in need of updating and enhancements in accordance with the new City standards for both signage and access ways recommended in this plan.

### Recreation

Day sailing and volleyball are popular at Baylake Beach, though low wave energy limits wave sports. Lifeguards are not present at this beach.



Well established dune



Historically stable beach - August 2001



Windy Road beach access

### Beach Nourishment

As a relatively stable beach, a program for beach nourishment does not appear to be necessary at this time. However, this area of beach is included in the "Section 933" federal project authority for the Norfolk Harbor Channels; suitable beach sand dredged from the Thimble Shoals and Atlantic Ocean Channels could be placed on this beach as nourishment at a very low cost. There are many provisos and conditions in using this authority, not the least of which is a requirement that the beach be clearly documented as available for public use if the City is to act as the local, cost sharing sponsor.

### Beach Title Issues

The modern subdivision plats for this neighborhood assert a non-public nature of the beach in Baylake Pines. These documents indicate that the beach is reserved for the exclusive use of the residents and owners of the community. The validity of this claim is not readily apparent. It is assumed, for obvious reasons, that the neighborhood would resist an effort to resolve this claim.

### Beach Maintenance

Litter receptacles are provided at each beach access, and are emptied daily during the summer months. Litter collection continues year round, though reduced in scope during the winter months. Beach grooming activities for this beach are modest and typically limited to once or twice a year in the winter months.



Beach access at the east end of Sandy Bay Drive

# BAYLAKE BEACH

## Recommendations

While the Beaches and Waterways Advisory Commission is sensitive and understanding to the neighborhood's claim of exclusive beach use rights, the highest priority recommendation for Baylake Beach is to resolve this matter and cause this beach to be fully documented as a public beach resource.

The lack of immediate need for public expenditures for beach nourishment and the limited beach use at this location tend to lessen the urgency for action to resolve this issue. However, while stable, Baylake Beach is not of sufficient size to offer substantial storm protection and during higher tides there is little useable beach for recreation. In order to facilitate future beach nourishment, such as a Section 933 project, clearly documenting this beach as a public resource is important and should be pursued.

After beach ownership is resolved, it is recommended that the City adopt an ordinance to regulate sail craft in the same manner as the North End beaches. In addition, and after the beach is clearly documented as a public resource, additional beach maintenance activities in accordance with the new program outlined in the Overarching Issues section of this plan are recommended.



Calm waters provide a safe family environment



Looking west - February 2002

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# OCEAN PARK BEACH

Ocean Park Beach, extending from Baylake Beach on the west to Lynnhaven Inlet on the east, is backed by the long established residential neighborhood of Ocean Park. Developed early in the City's history, Ocean Park is characterized by predominantly single-family homes built in a uniquely-irregular subdivision of curved streets and cul de sacs. Some redevelopment and modern in-fill has recently occurred, trending toward multi-family and upscale, multistory beach-style homes. The extreme west end of this beach is backed by the Aries on the Bay condominium development, and the east end is backed by two mid-rise condominiums.

The majority of this one-mile beach is erosional, influenced greatly by Lynnhaven Inlet. Like the other bayfront beaches, the degree of erosion is significantly less than that experienced on the open ocean coast; current estimates for erosion losses for this 6,450-foot section of beach are less than 30,000 cubic yards per year. The eastern extreme of this beach segment suffers the highest degree of erosion, and as a consequence has been largely bulkheaded for storm protection. The western portion of the beach system boasts a relatively stable, but small, dune system. Erosion has been kept in check at Ocean Park Beach through a series of intermittent beach nourishment projects in connection with the maintenance dredging of Lynnhaven Inlet.

Ocean Park is clearly documented as being a public beach. Beach access is well distributed, though on-street parking opportunities are limited. The new Lynnhaven Boat Ramp and Beach Use Facility at the southwest abutment of the Lesner Bridge will greatly enhance public access to this beach.

Aside from quality family beach experiences, Ocean Park Beach has become host to a large number of daysailers. Existing City Code does not regulate the storage of sail craft on Ocean Park Beach. At times, the number of stored vessels on the beach has been considered problematic by area residents in terms of crowding of the recreational space, impacts on vistas and dunes, and the threat of property damage resulting from stored boats becoming airborne during storm events.



*Beach areas are documented as public*

*Beach replenishment program included in inlet dredging program*

*New beach parking lot with a beach use facility and boat ramp*

*Good family beach (bay beach)*



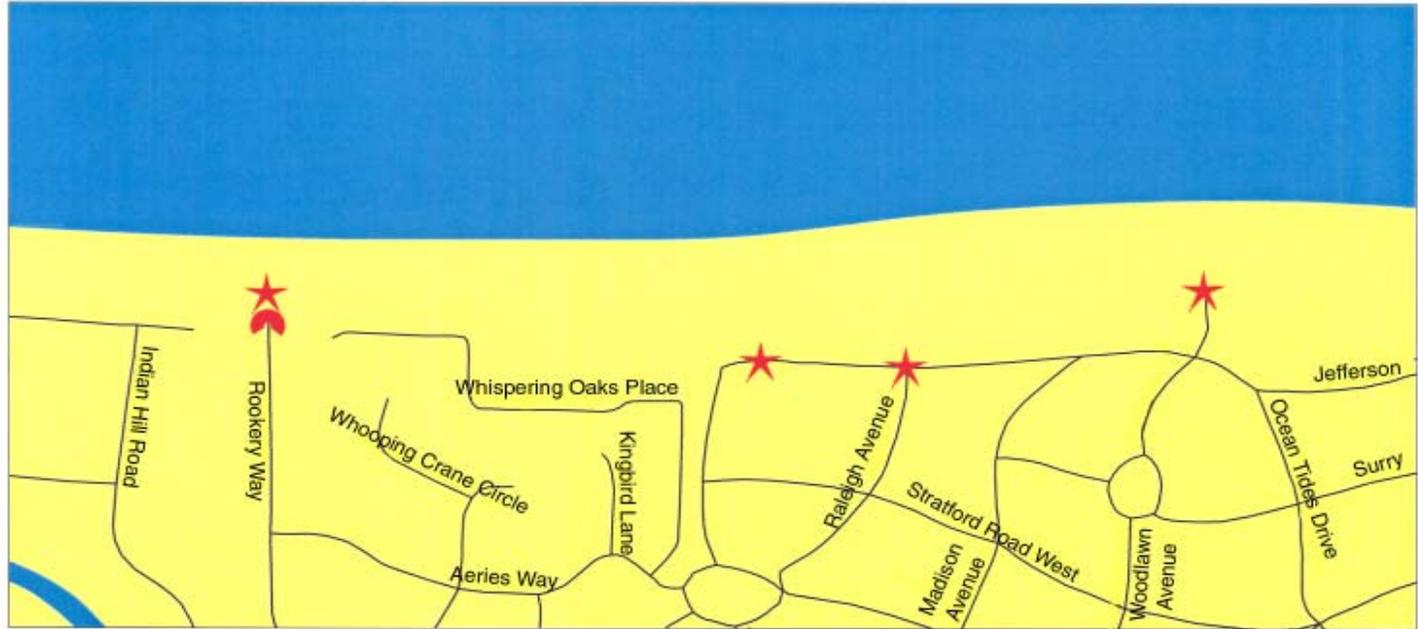
Sailing is a popular activity



Calm waves provide a safe family environment



Fun for all



**Public Parking**

On-street parking opportunities are limited but do exist throughout the neighborhood. The nature of the roadway alignments and widths, and the density of development, limits the opportunity to enhance on-street parking opportunities. The new boat ramp and beach use facility provides an additional 115 public parking spaces for beach use.

**Beach Access**

Public beach accesses exist at:

- West end of Jefferson Blvd.
- Windsor Crescent
- Jefferson Blvd. and Woodlawn Ave.

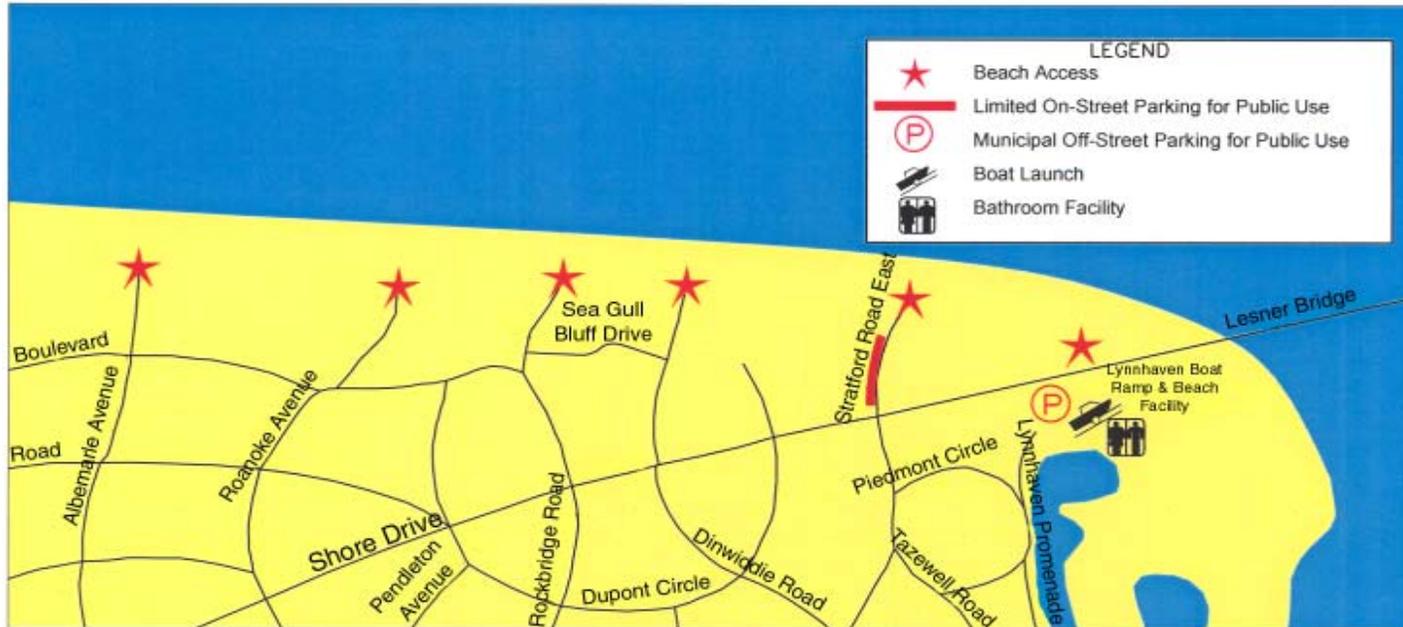
- Albemarle Avenue
- Roanoke Avenue
- DuPont Circle

- Dinwiddie Road
- E. Stratford Road
- Lesner Bridge

The existing beach accesses at Ocean Park are semi-improved pathways between residences and remnant dunes to the beach. The full installation of walkways and additional screening for the adjacent residences are desired, along with updates and enhancement of signage. A beach access, via an elevated boardwalk beneath the Lesner Bridge, was constructed as part of the Lynnhaven Boat Ramp and Beach Use Facility. Access signage is in need of updating and enhancements in accordance with the new City standards for both signage and access ways recommended in this plan.

**Recreation**

The issue of sail craft storage on the Ocean Park Beach has created some concern from area residents. One method of addressing this concern may be to consider a system of sail craft permitting, similar to the program in place for the North End. Jet skis also present a concern for many area residents. The use of the beach for launching and landing of the craft creates conflicts with beach users, and the noise created by the jet skis has been noted as disturbing. Lifeguards are not present at this beach.



Little tikes enjoying their day at the beach



Before beach replenishment west of Lynnhaven Inlet - August 2001



After beach replenishment west of Lynnhaven Inlet - February 2002

### Bathroom Facilities

The Lynnhaven Boat Ramp and Beach Use Facility serves this beach segment and includes bathroom facilities and outdoor showers.

### Beach Nourishment

This beach has been nourished primarily as a part of the Lynnhaven Inlet maintenance dredging project, which occurs on a three to four-year cycle. The Lynnhaven Inlet dredging project had historically been used as a source of sand for the annual Resort Beach Restoration and Maintenance Project ("truck haul"). With changes in the Resort Beach nourishment program, from a truck haul of sand from Lynnhaven Inlet and other inland sources to a less frequent contract for offshore sand mining, a permanent program of using Ocean Park Beach as a primary placement area for the dredged sand as beach nourishment should be adopted. With an annual beach erosion loss averaging less than 30,000 cubic yards for Ocean Park, and with the inlet generating an average of over 50,000 cubic yards of beach quality sand per year, sufficient volumes of dredged sand exist to sustain Ocean Park Beach and Cape Henry Beach under such a program.

### Beach Title Issues

The beach is clearly documented as a public resource.

### Beach Maintenance

Litter receptacles are provided at each beach access, and are emptied daily during the summer months. Litter collection continues year round, though reduced in scope during the winter months. Beach grooming activities for this beach are modest and typically limited to once or twice a year in the winter months.

# OCEAN PARK BEACH

## Recommendations

As a clearly documented public beach, with an on-going beach nourishment program and a new public beach parking facility, few issues exist which need to be addressed at this time.

It is recommended that City Council endorse and formalize this beach as the primary recipient of dredged sand from Lynnhaven Inlet. Further, it is recommended that a modest program of access and signage improvement be adopted in accordance with the new standards outlined in the Overarching Issues section of this plan.

It is also recommended that City Council adopt an ordinance to regulate sail craft on the beach in the same manner as the North End beaches. Finally, it is recommended that beach maintenance activities be enhanced in accordance with the new program outlined in the Overarching Issues section of this plan.



Effects of erosion



View looking east -  
February 2002



Dunes at the West end

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# LYNNHAVEN INLET

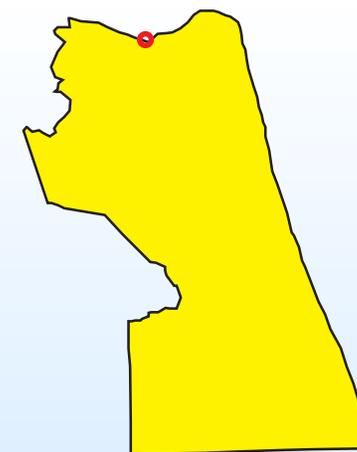
As a natural inlet draining a large estuary, Lynnhaven Inlet has a rich history. As noted by Captain John Smith during the First Landing, the inlet has always been part of what makes Virginia Beach a special place. With several thousand waterfront residences and the majority of the City's marinas within the Lynnhaven basin, the inlet's importance to life styles, property values and our City's prosperity cannot be overstated.

The inlet had meandered prior to the development of the modern navigation channel system. There are reports and speculation that Pleasure House Creek was once the direct access to the bay with the inlet being several thousand feet west of its modern location. By the 1950's however, with the construction of the bridge across the inlet, the current location had been fixed.

The Corps of Engineers first became involved with Lynnhaven Inlet in the early 1960's, and has performed all inlet maintenance dredging since then. The inlet gradually shoals from sands moving along the bay coastline, both east and west. The gradual shoaling patterns have allowed the Corps to adopt a program of dredging the inlet on three to four year intervals.

Since 1970, all of the sand removed from the inlet has been used for beach replenishment. Until 2001, the majority of the sand removed from the inlet had been 'stockpiled' on City owned property to the west of the inlet and used to replenish the oceanfront resort beach. The inlet generates approximately 200,000 cubic yards of dredged sand every three to four years. The oceanfront beach replenishment program during this same period involved a truck haul of 150,000 cubic yards per year. Thus, every third or fourth year the Lynnhaven Inlet sand stockpile was the primary source for the beach replenishment program. Typically, the remaining 50,000 cubic yards of sand were used as a supplementary source at the time of the next replenishment.

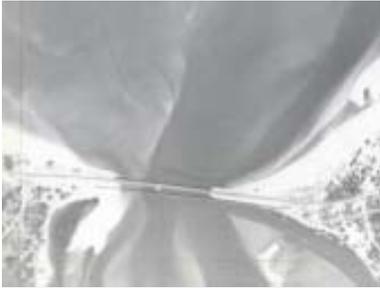
Though the majority of the material was reserved for the Resort Beach replenishment program, during this same period some of the dredged sand from the inlet was used to replenish Ocean Park Beach. Since the Resort Beach had the highest priority for replenishment, the amount of sand available to Ocean Park had not been enough to completely arrest erosion at that beach.



## *Vital City Asset*

*Requires maintenance dredging every three to four years*

*Important beach replenishment sand source*



Lynnhaven Inlet in 1949

# LYNNHAVEN INLET

The Resort Beach replenishment program, however, dramatically changed in 2001 with the implementation of the beach restoration component of the Virginia Beach Erosion Control and Hurricane Protection project. From this point forward, the Resort Beach is programmed to be replenished through the mining of beach sand from offshore areas.



Lynnhaven Inlet - February 2002

The result of the change in the Resort Beach replenishment program created increased availability of dredged sand for use on other beaches. In 2001/2002, Ocean Park Beach was the sole recipient of the sand dredged from the Corps' inlet management program. The result was a mini-restoration project for Ocean Park Beach. However, Ocean Park Beach cannot provide enough capacity for every dredging event as the inlet generates more sand in maintenance dredging than Ocean Park loses to erosion.

## Recommendations

As discussed in the Cape Henry section of this plan, we emphasize that a portion of the Lynnhaven Inlet maintenance dredging sand should be pumped directly onto the public portion of Cape Henry Beach. City beach management staff informs that the combined capacity of Ocean Park Beach and Cape Henry Beach could be sufficient to receive the sand generated by the inlet maintenance dredging program. Any excess sand should be placed in the sand stockpile and be available for truck hauling of emergency replenishments or mid-inlet dredging cycle replenishments at Cape Henry or Ocean Park Beaches.



Lesner Bridge

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# CAPE HENRY BEACH

Cape Henry Beach extends from Lynnhaven Inlet on the east to First Landing State Park on the west, approximately two miles in total length. Though treated as one beach from a beach management perspective, there are two distinct communities behind this beach, north of Shore Drive: the higher density, mid to low-rise condominium style neighborhoods in the west, and, the less dense single family/duplex/townhome neighborhood in the east. Recent and continued redevelopment has remarkably changed the character of this beachfront community from modest bungalows and single family homes developed in the post-war years to a sparkling array of multistory, upscale condominiums, multiplexes and beachfront homes.

The beach is characterized as relatively stable from an erosion perspective, though localized erosion persists in the lee of the Lynnhaven Fishing Pier. The eastern portion of the beach boasts a healthy dune system and a natural fronting beach. The dune system diminishes in the middle section of Cape Henry Beach to a single line of primary dunes, the area immediately west of the pier is bulkheaded against the effects of localized erosion. The westernmost portion of the beach, closest to Lynnhaven Inlet, is slightly accretional, owing chiefly to the effects of the inlet's natural ebb tide (or outside) shoal field which dampens wave energy in storm events and the general trend of westward, inlet influenced, beach sand migration.

Public access to Cape Henry Beach is plentiful, though on-street and parking facilities are limited. The relatively quiet wave climate and healthy natural beach systems in the eastern and western sections of the beach provide quality recreational opportunities for families and the growing mature citizen population.

As with other bayfront communities, the issue of beach ownership exists in Cape Henry Beach. As much as half of the bayfront beach is currently claimed as being private property, being the result of claims of ownership asserted during the initial subdivision and development and shoreline retreat onto platted property caused by moderate erosion. A handful of property owners, chiefly condominiums near the fishing pier, have dedicated public beach easements to rectify this situation; five additional condominiums in this area have recently stated a willingness to dedicate such easements. The claim of private ownership has historically prevented the City of Virginia Beach from addressing beach erosion in a comprehensive and programmatic manner.



*Beach Ownership issues*

*Beach restoration and replacement needed*

*Access points are spread throughout the area*

*Limited impact to residents from visitor parking*

*Good family beach (bay beach)*



Duck Inn Gazebo



Quiet family beach



East side of Lynnhaven Inlet - February 2002



**Public Parking**

On-street parking is limited in the western portion of Cape Henry Beach, and non-existent in the eastern portion. Narrow street right of ways coupled with the density of development leave little room to enhance on-street parking without being highly impactful on the community. Access from a Shore Drive parking facility with public beach transit may be a future possibility.

**Beach Access**

Access improvements range from at-grade dune cross-overs at the eastern and western extremities, to access stairways in the central portion of the beach. Walkway improvements at several accesses are desired and existing signage is in need of updating.

Public beach accesses exist at:

- |                |                      |                    |
|----------------|----------------------|--------------------|
| Jade Street    | West Great Neck Road | Bayberry Street    |
| Kleen Street   | Beech Street         | Wake Forest Street |
| Urchin Road    | Oak Street           | Hatton Street      |
| Red Tide Road  | Maple Street         | Walke Street       |
| Ebb Tide Road  | Sandalwood Road      | First Landing Lane |
| Calvert Street | Kendall Street       |                    |

**Recreation**

The issue of sail craft storage on the Cape Henry Beach has created some concern from area residents. One method of addressing this concern may be to consider a system of sail craft permitting, similar to the program in place for the North End. Jet skis present a concern and issue for many area residents. The use of the beach for launching and landing of the craft creates conflicts with beach users, and the noise created by the jet skis has been noted as disturbing. Fishing is a popular activity at this beach as anglers have access to Lynnhaven Inlet and the Lynnhaven Fishing Pier. Lifeguards are not present at this beach.

**Bathroom Facilities**

Bathroom facilities are not available at this beach.



Multiple recreational opportunities



Newer beachfront condominiums



Lynnhaven Fishing Pier

### Beach Nourishment

The localized effects of erosion immediately west of the fishing pier have been addressed through three recent small-scale beach nourishment contracts. Because of private ownership claims in this vicinity, the scale and effect of these efforts have been minimal. To fully combat the moderate affects of erosion for the entire beach, and to properly address the localized erosion near the fishing pier, requires a more comprehensive approach. As with other bayfront beaches, the relatively shallow nearshore fronting this beach would permit a modestly scaled beach nourishment program to have a significant and positive effect. An initial restoration project, broadening the beach in the middle portion of the reach should be accomplished, followed by periodic, low frequency, beach nourishment to maintain the restored beach. It is anticipated that sand dredged from the Lynnhaven Inlet maintenance program would be a key and cost efficient element to such a program.

### Beach Title Issues

Most of the current Cape Henry Beach bayfront had at one time been claimed as private property largely as a result of erosional shoreline retreat onto platted land. The current situation with respect to beach ownership has three forms: clearly documented as public beach, either reserved for public recreation in the original subdivision plats or dedicated through recent or pending public beach easements; claimed as private property by adjacent residents and businesses through modern plats; or, clouded by claims of ownership through purchase from the 'receivers' of the original subdivider's interests in streets and common areas. The five pending public beach easement dedications by condominiums west of the fishing pier would close the gaps in documented public beach interest in the central portion of the beach, creating a reach of more than a mile in length. Although some private signage exists in the western extreme of the beach, the public's right to full use of this beach has largely been uncontested throughout the City's history.

### Beach Maintenance

Notwithstanding ownership issues, litter collection and flotsam removal for this entire beach is accomplished on a weekly basis during peak summer months, less frequent during winter months. Special cases of major flotsam removal, chiefly damaged bulkhead and access stair debris after storm events, occur on an annual basis. Grooming of the beach is limited to semi-annual events, generally in the late spring and fall, when resources dedicated to the resort area during summer months are available for work in other beach areas.



Oak Street beach access

# CAPE HENRY BEACH

## Recommendations

The localized effects of erosion in the area surrounding the fishing pier have a significant impact on storm protection and recreation and should be addressed. It is essential to resolve the beach title issues for the entire beach segment to structure an effective long-term program of beach nourishment and stewardship.

However, the immediate threat to development and infrastructure from localized erosion in the central portion of this beach demands prompt attention. Staff is currently preparing, for City Council consideration, proposed easement dedication agreements for five willing condominiums, which will fill the gaps and create a clear public interest in over one-mile of the central area of the beach. It is therefore recommended that City Council approve the acceptance of these easements and consider authorizing an initial beach restoration project for this reach. Council may wish to consider linking this restoration project with the anticipated 2004 Lynnhaven Inlet maintenance dredging contract in which a sufficient volume of beach quality sand at relatively low cost should be available.

It is also recommended that City Council consider authorizing staff to pursue resolution of the beach ownership issue for this entire beach, to facilitate an effective long-term program for beach stewardship. Given the immediate threat to the central portion of the beach, the Beaches and Waterways Advisory Commission recommends that action in that area not await ownership resolution for the entire beach.

It is recommended that modest improvements to the beach accesses in this area be programmed, and that signage be updated and enhanced in accordance with the new standards outlined in this plan. In addition, the City should consider adopting an ordinance to regulate sail craft on the beach in the same manner as the North End beaches. Finally, it is recommended that beach maintenance and grooming be enhanced in accordance with the program outlined in the Overarching Issues section of this plan.



Westminster-Canterbury - west of Fishing Pier



Looking west - August 2001

BEACHES AND WATERWAYS  
ADVISORY COMMISSION

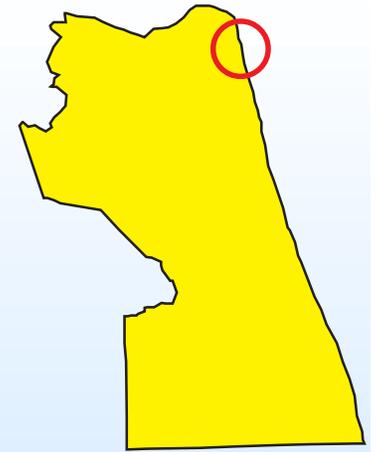


# NORTH END BEACH

The North End of Virginia Beach's oceanfront is a crown jewel of beach neighborhoods. A blend of lovely historic homes, mansion-scale newer residences, and upscale single and multifamily homes and bungalows, nestled in mature landscaping with distinctive streetscapes, next to the healthiest and most expansive accessible ocean beach in the mid-Atlantic states, the North End is arguably Virginia's premier neighborhood. Current property values in the neighborhood would appear to substantiate that argument.

The North End Beach, for the purposes of this plan, is that three-mile portion of the oceanfront north of the Resort Beach, from 42nd Street on the south to the border with U.S. Army Fort Story, north of 89th Street. This beach segment can be divided into three erosion characteristic zones: the northern zone between 65th and 89th Streets, the middle zone between 58th and 65th Streets, and the southern zone from 42nd to 58th Street. As the result of a net northerly migration of sand along our Atlantic oceanfront, the northern zone of this beach is naturally accretional and boasts an extensive, multi-layered dune system. The beach between 58th and 65th Streets is more correctly characterized as naturally stable, with a somewhat less extensive dune system. The extreme southern zone, between 42nd and 58th Streets, suffers from moderate, seasonal erosion during the winter months and, lacking a dune system, is protected by a seawall constructed as part of the Beach Erosion Control and Hurricane Protection (BECHP) project.

Access to the North End Beach is outstanding, an improved walkway across the dune or an access stair and ramp across the seawall is provided at each street end. New timber dune cross-overs have been constructed for each street north of 59th Street as part of the BECHP project. A debate exists over the adequacy of available on-street parking – beach going non-residents complain of a lack of spaces while residents point out that vacant spaces are available within easy walking distance to the beach. The City of Virginia Beach leases an oceanfront parcel of land from Fort Story, just inside of the gate at 89th Street, and has developed an oceanfront parking lot, with access to the beach and semi-permanent bathroom facilities. This facility is only available for public use, under the terms of the current lease, from Memorial Day to Labor Day. Future expansion of this facility would help to address the parking issue.



*Beach areas are documented as public*

*Stable beach with replenishment program in place*

*Excellent beach access*



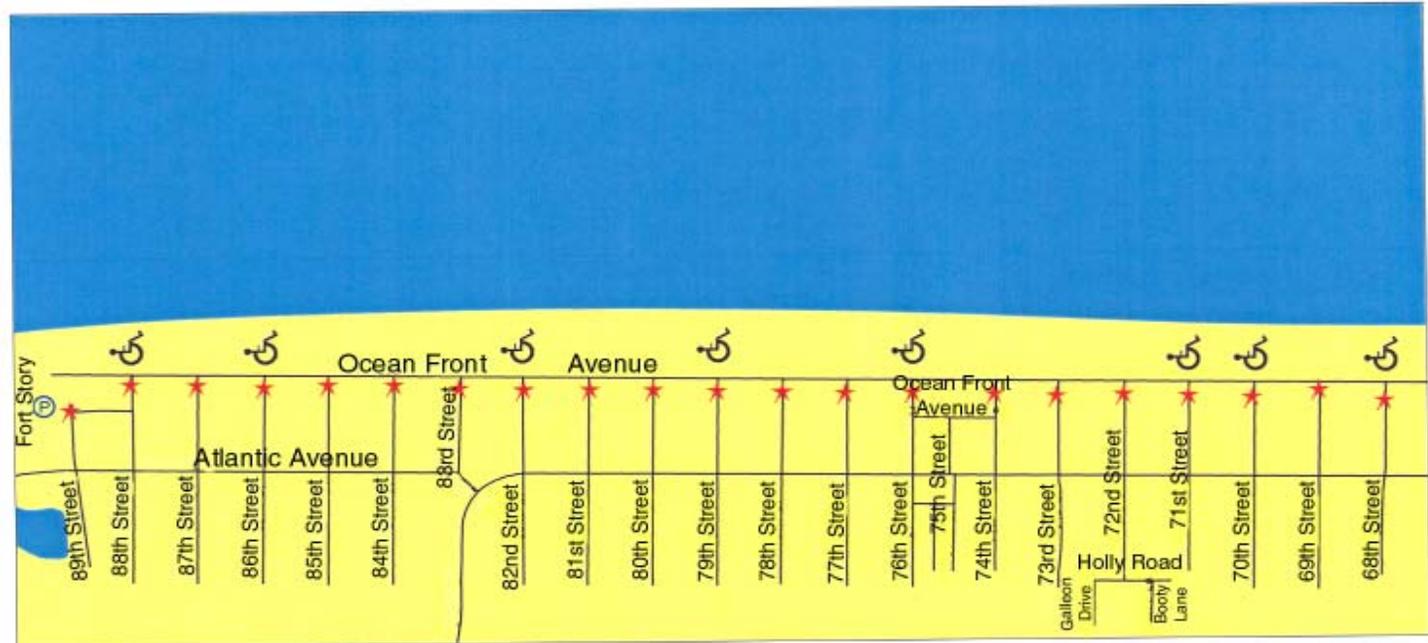
The early stages of a sandcastle



New Dune Cross-over at 89th Street



Extensive dunes



### Public Parking

On-street parking is available on all numbered streets. Beach goers should be alerted to the availability of on-street parking in the blocks west of Atlantic Avenue, just a short walk from the beach. The leased public parking lot just inside of the gate at Fort Story provides over 200 parking spaces during the Memorial Day to Labor Day beach season.

### Beach Access

Each street has a beach access, except for 75th Street. Handicap ramp accesses are available from 42nd Street to 58th Street. Beginning in October, 2001, new dune cross-overs will be constructed. Handicap access via accessible ramps will be available at the following streets:

- |             |             |             |
|-------------|-------------|-------------|
| 61st Street | 71st Street | 86th Street |
| 64th Street | 76th Street | 88th Street |
| 68th Street | 79th Street |             |
| 70th Street | 82nd Street |             |

### Recreation

This relatively long beach resource is host to a variety of beach and water sports. Volleyball courts have been established at many street ends, surfing, fishing and sailing are enjoyed throughout the North End Beach. A sailboat beach storage permit program is actively enforced. A recent concern has been raised by the community regarding safety issues of launching and landing of jet skis in the North End amongst swimmers.

Surfing in the North End is restricted during normal beach hours from Friday to Sunday in the summer. Lifeguards are not present at this beach, except at 57th Street.



Plenty of room to enjoy



Birthday party on the beach



Looking south - February 2002

**Bathroom Facilities**

Semi-permanent bathroom facilities are provided during the Memorial Day to Labor Day beach season at the leased public beach use facility inside the gate at Fort Story.

**Beach Nourishment**

Although the majority of this beach is accretionary or stable, the entire beach segment is included in the scope of the BECHP project beach restoration and maintenance phases. Where needed, that is where ever the beach is less than the design beach profile for the BECHP project, sand nourishment will occur during the initial construction of the beach restoration phase and during each subsequent renourishment during the project's 50-year authorization. This assures that the North End Beach will remain healthy. In addition, dune augmentation has been accomplished, in lieu of a seawall, in this segment to achieve the BECHP design level of storm protection north of 59th Street. In cases where the existing dune crest is lower than an elevation of 18 feet above mean sea level, sand was added to the dune to bring it up to that minimum dimension as part of the construction contract for the dune cross-overs.

**Beach Title Issues**

Modern plats and historic public beach use clearly indicate that this beach is fully public.

**Beach Maintenance**

Litter is collected daily from beachside receptacles during the summer months. The number of receptacles and the frequency of service are reduced during the winter months. Grooming is performed on a regular basis during the summer months, and as needed during the winter months after storm activity.

# NORTH END BEACH

## Recommendations

As a vibrant and healthy beach system, included within an existing beach nourishment program, with ample and newly refurbished accesses, and adequate beach maintenance service, there are no traditional beach management recommendations for the North End Beach.

While a perception exists that additional parking is needed for this beach segment, the opportunities to provide additional parking without adversely impacting the neighborhood are limited. It is recommended that the leased parking lot at Fort Story be reviewed for opportunities to create a year round facility, perhaps through acquisition of the parcel by the City of Virginia Beach. In addition, it is recommended that the City Council consider authorizing staff to inquire about the Navy Beach Club property, seeking a first right of refusal or option on the property, for the creation of a City public beach use facility, should the Navy ever choose to dispose of the property. Having a historical use as a beach club, conversion of this property to a City beach facility appears to be an opportunity to enhance public beach facilities in the North End without significantly impacting the neighborhood.

Finally, although new timber dune cross-over accesses were constructed as part of the BECHP project, access signage enhancements are recommended in accordance with the new standards stated in this plan.



Looking north from the Cavalier - August 2001



Looking north from the Cavalier - February 2002



Very accessible beach

BEACHES AND WATERWAYS  
ADVISORY COMMISSION



# RESORT BEACH

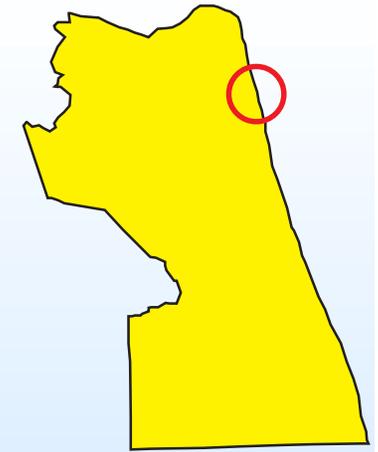
The Resort Beach's history as a vacation and recreational destination can be traced back to the early 20th century when the first wooden boardwalk was constructed. Incorporated into the City of Virginia Beach with the surrounding county in 1963, the resort area is characterized by densely developed tourism industry offerings, ranging from near-beach motel accommodations to oceanfront hotels, and from ice cream and amusements to fine dining. Visited by over 2 million overnight guests per year, the resort area tourism market generates over \$600 million in annual spending. Local tax revenues generated by this industry exceed \$40 million annually, and net, after all costs, upwards of \$15 million in annual revenue to support City services in other sectors.

Maintenance and management of beach amenities in the resort area have been consistent throughout its history. Beach replenishment, beach accesses, an oceanfront promenade, parking, lifeguards, and most all other beach use needs and amenities have been fully developed in this area, underpinning our City's namesake - Virginia Beach.

After 100 years of nearly continuous improvement, two recent major public works endeavors have made a remarkable difference in the appearance and function of the resort area: the nearly \$80 million 'street scape' conversion of Atlantic Avenue and the \$120 million 'beach erosion control and hurricane protection project' which included seawall, boardwalk, drainage and beach restorations. A replacement for the Pavilion Conference Center is currently being designed; the new \$200 million facility will bring larger, increased conference business to the resort.

Citizens and tourists enjoy easy access, plentiful parking, well maintained public bathroom facilities, lifeguard service during the summer months, a clean, groomed, 'world class' beach, and a park-like setting along the 2.5-mile resort oceanfront.

City Council has established the Resort Advisory Commission to address issues primarily related to the resort area. The recommendations in this plan are intended to compliment the Resort Advisory Commission's work.



*Most beach areas are clearly documented as public*

*World class boardwalk and beach*

*Excellent access and ample parking*

*Best access to public transportation*

*Permanent public rest room facilities*

BEACHES AND WATERWAYS  
ADVISORY COMMISSION



Looking north - August 2001



Enjoyable family experience



Lifeguards ensuring public safety

# RESORT



## Public Parking

Over 4,000 public parking spaces are available at either city-owned lots, privately operated lots, or at metered on-street locations. The City Owned/Operated Lots are:

- |                                 |                                 |
|---------------------------------|---------------------------------|
| 4th Street Municipal Lot        | 19th Street North Municipal Lot |
| 9th Street Parking Garage       | 25th Street Municipal Lot       |
| 19th Street South Municipal Lot | 31st Street Municipal Lot       |

Non-metered on-street parking is available in some of the adjacent residential neighborhoods, but is limited to daytime use only without a permit.

## Beach Access

Permanent, illuminated, architectural concrete access stairways and accessibility ramps are provided at each street end within the Resort Beach. Cross-beach timber walkways for full accessibility are provided at 8th, 17th, and 30th streets. Vehicular access for beach maintenance and emergency vehicles is provided by four permanent, concrete ramps located at 2nd, 14th, 20th, and 37th streets.

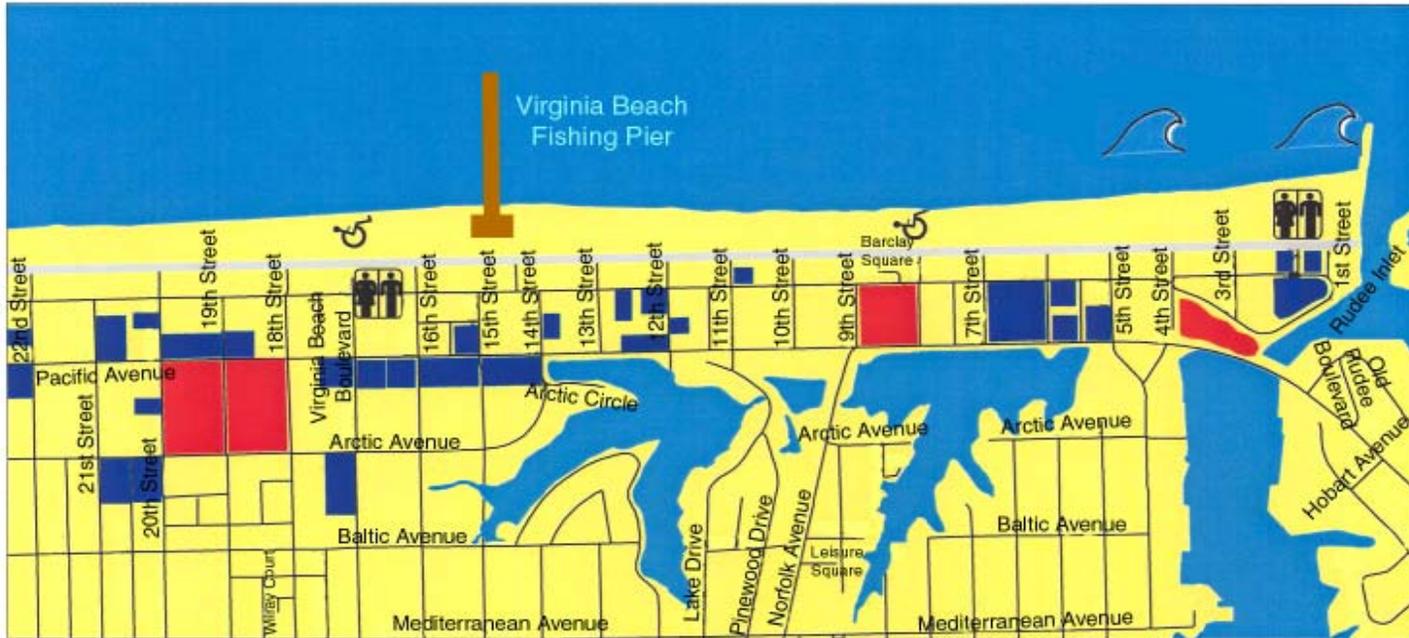
## Recreation

Residents and tourists enjoy a wide variety of activities at the Resort Beach. The Boardwalk is the perfect place to walk, run or rollerblade. A dedicated bike path runs parallel to the Boardwalk and is popular way of seeing the entire 2.5 mile stretch in a matter of minutes. Other activities include fishing on the Virginia Beach Fishing Pier, charter boats, whale and dolphin watching cruises, jet ski rentals, para-sailing, and volleyball. There are a number of festivals and events scheduled throughout the year.

Surfing at the Resort Beach is restricted during normal beach hours in the summer to two zones:

- Rudee Inlet to 2nd Street
- 4th Street to 5th Street

Lifeguards are present from 1st Street to 42nd Street during the summer months.



### Bathroom Facilities

Bathroom Facilities are located at 2nd Street, 17th Street, and 30th Street. During the summer months, portable bathroom facilities are located on the beach at several of the accesses.

### Beach Nourishment

The history of beach replenishment at the Resort Beach is long and successful. Since 1951, the Resort Beach has been replenished, in one form or another, each and every year. Nearly 20 million cubic yards of sand have been placed on the beach to counteract the long term effects of natural beach erosion. This year, with the completion of the Beach Erosion Control and Hurricane Protection project, the Resort Beach has been restored to a width of 300 feet. A long term contract between the Army Corps of Engineers and the City of Virginia Beach has been formed to assure maintenance of the restored beach for 50 years, through 2050.

### Beach Title Issues

Though modern plats and historic public beach use indicate clear public ownership of the beach, private ownership has been asserted between 40th and 42nd Streets and between portions of 1st and 5th Streets. A court case filed in claim of such private ownership between 1st and 5th Streets was brought in 1998. In response to that action, the Norfolk Circuit Court found the claimant to have committed fraud on the court and the City and awarded the City more than \$600,000 in damages.

### Beach Maintenance

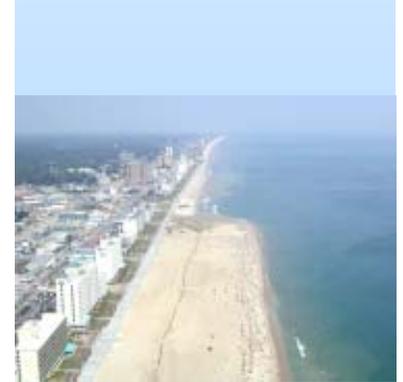
Litter receptacles are available along the beach, at all beach access and along the boardwalk. Daily collection is provided during the summer months. While the number of receptacles is reduced during the shoulder and winter months, they are emptied each day. The Resort Beach is groomed daily during the summer and shoulder seasons; grooming activity in the winter is limited to storm event response and preseason preparation. During the summer months, the Boardwalk is cleaned with vacuuming equipment by permanent personnel each day and temporary summer help police it by hand each evening.



New Boardwalk and Seawall



Full service beach



"Operation Big Beach - 300 Feet of Fun!"



Boardwalk and bikepath

# RESORT BEACH

## Recommendations

Since a program of beach replenishment is in place, and another body, the Resort Advisory Commission, has been organized to address access and usability issues, there are no immediate recommendations for the Resort Beach other than modifying and improving the signage. It is recommended that the signage be improved in general conformance with the new program outlined in this plan; however the Resort Advisory Commission should take the lead in such an effort for this area.

The vital nature of the long term beach replenishment program does prompt the Beaches and Waterways Advisory Commission to recommend that every effort be made to perpetuate and continue the program.

Finally, as the beach has recently been widened, creating a vast new area for recreation, it is recommended that some beach use restrictions (frisbee and ball sports) be relaxed.



Before beach replenishment in 1998



After beach replenishment in 2002

BEACHES AND WATERWAYS  
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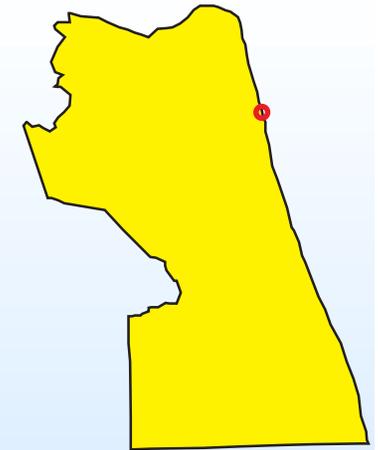
# RUDEE INLET

Rudee Inlet was once a small, meandering, tidal swale that drained a relatively small marsh estuary. Today, Rudee Inlet is a vital tourism, commercial fishing and recreational boating asset at the Oceanfront which provides direct ocean access from the resort area. It also remains an important component of the City's beach erosion control program.

As the Town of Virginia Beach began developing the oceanfront as a resort, efforts were made to limit the natural movement of this inlet. In the late 1920's, a concrete culvert was constructed across the tidal waterway to provide a bridge to access the oceanfront to the south (now Croatan) and to control the ebb and flood of the tide through a hand-operated wooden sluice. Beach erosion was not addressed during the 1930's and 1940's. In 1952, in cooperation with the Commonwealth of Virginia, the Town began to mine sand from the marsh area (now Lake Rudee, Owls Creek and Lake Wesley) behind Rudee Inlet to replenish the severely eroded beach.

In the early 1950's, small jetties were installed on either side of the inlet to arrest its meandering and to facilitate access to the mining areas by dredges arriving from sea. After removing more than 3,500,000 cubic yards of sand for beach replenishment, the former interior marsh became an open water estuary, directly connected to the partially improved inlet. This prompted development along the interior shorelines and created commercial and recreational boating demands on Rudee Inlet.

Design efforts began in the mid-1960's to improve the inlet for navigation. This was done with recognition of the impacts of a maintained inlet on the natural sand transport (littoral drift) along the open coast. At the Oceanfront, littoral drift is greater to the north than to the south. Though coastal engineering as a discipline was new at the time, it was known that an inlet, made and maintained by man, would interrupt the natural sand flow. This interruption would deprive the northern beach (downdrift) of sand that would have moved to the north if not blocked by the inlet's jetties. This also would have caused over-accretion of the southern beach (updrift) to the point of impacting navigation in the inlet. Accordingly, Rudee Inlet was designed, like many other east coast inlets, to facilitate artificial 'by-passing' of sand in an attempt to mimic the natural processes and reduce its impacts on the adjacent beaches. The design assures that Rudee Inlet remains a vital element in the City's overall beach management program.



*Vital City Asset*

*Requires continued  
maintenance dredging*

*Important component of  
beach erosion control  
program*

*Repair of aging  
infrastructure required*

BEACHES AND WATERWAYS  
ADVISORY COMMISSION



Rudee Inlet after the 1962 Ash Wednesday Storm



Rudee Inlet immediately after infrastructure improvements, March 1968



Rudee Inlet, over accumulation to the south, 1971

**BEACHES AND WATERWAYS  
ADVISORY COMMISSION**



Completed in 1968, the Rudee Inlet infrastructure includes navigational jetties and a sand trap. The sand trap is a wave-sheltered area where sand is allowed to accumulate so that a dredge can operate to pump the sand to the north to replicate the natural sand flow pattern, without impacting the navigation channel. The sand trap is sheltered by a timber weir (or wall) to the south, an offshore jetty to the east and the northern navigational jetty. The sand trap is dredged to a depth 20 feet below mean low water to create and maintain its sand trapping characteristic. The timber weir to the south has a top elevation of 'zero' (mean sea level) to allow littoral sand to flow over it, under wave induced forces, and settle in the 'trap' for by-passing to the north by dredging. The wave-sheltered environment within the sand trap facilitates efficient dredging by allowing work in calmer waters when the wave climate would otherwise not allow.

Estimates of the amount of sand transported along our open coast, the volume which needs to be by-passed at Rudee Inlet to maintain equilibrium, have varied over the years as the discipline of coastal engineering advanced and as records of dredging practices at the inlet have developed and been available for detailed 'cause and effect' review. In the 1960's, it was thought that the annual volume of sand to be by-passed was 100,000 cubic yards or less. In the 1990's, after several more studies, the annual volume of sand to be by-passed was thought to be upwards of 200,000 cubic yards. The most recent study of the inlet, the December 2001 Rudee Inlet Management Study, found that the value ranges from 250,000 to 300,000 cubic yards per year. It should be noted that this study does not take into consideration the newly constructed beaches to the north and what effects, if any, it will have on net littoral transport or inlet maintenance.

Maintaining Rudee Inlet has been a constant challenge. The City and the Commonwealth jointly funded a dredging operation (under the former Virginia Beach Erosion Commission) from 1952 to 1989. Adequate by-passing rarely occurred during this period, owing to underestimates of the natural littoral processes, under-staffing and an under-equipped dredging operation. As a result, by the end of the 1980's, a large accumulation of sand had developed to the south of the inlet. This accumulation caused the active shoreline to move almost 300 feet from the location needed for efficient sand transfer into the sand trap, and allowed a wide beach and expanded dunes to grow along the northern reach of Croatan. This over-accretion on Croatan Beach hampered efforts to maintain Rudee Inlet both by reducing the efficiency of the sand trap and by diverting sand around the jetties where it settled and routinely shoaled the open ocean portion of the channel.

In 1989 the Virginia Beach Erosion Commission was dissolved as a quasi-state agency and the dredge operation was transferred to the City. However, the challenge in maintaining the inlet

# RUDEE INLET

remained. To help with this, the Corps of Engineers initiated participation in Rudee Inlet maintenance dredging in 1990. The Corps issues an annual contract to supplement the work done by the City dredge crews, and employs a Corps-owned dredge, *Currituck*, up to four times a year to clear the open ocean portion of the channel. City Council authorized additional staff for the City dredge in 1998, enhancing the crew formulation to provide for nearly 24/7 coverage. The combination of the Corps' involvement, and the additional staffing of the City dredge operations, has made a remarkable difference. Shoaling in the channel has been greatly reduced, and the accumulation of sand 'up drift' (to the south) of the sand trap has diminished.

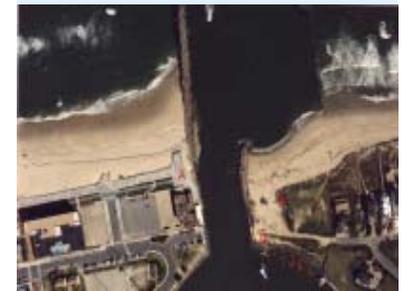
The removal of the accumulated sand re-exposed much of the timber weir, revealing that it had deteriorated to the point of needing replacement. The inshore jetty anchoring the timber weir to land was also re-exposed as the sand was removed. This feature had also deteriorated and was in need of repair or replacement. During storm conditions, this had allowed the ocean to flank the weir structure, carrying with it sand from the southern beach. The City began a study to determine if the replacements could be situated in such a manner to reduce maintenance dredging requirements and enhance adjacent beaches. The December 2001 Rudee Inlet Management Study, found that significant changes to the geometry of the inlet were too costly when weighed against the potential benefits to be derived from such changes. Accordingly, the study recommended the following: a course of action to repair the aging infrastructure on the inlet's south side; a modest enhancement of sand-tightening of the north jetty; and the construction of a north jetty spur to limit the amount of southward moving sand that flanks the jetty and settles in the outer portion of the channel.

## Recommendations

The Commission supports the findings of the 2001 Rudee Inlet Study. Specifically, we recommend the immediate repair of the aging inlet infrastructure to minimize the effects of the inlet on Croatan Beach and to assure proper maintenance dredging. We recommend that the south structures, the weir and its inshore jetty be fixed first. We further recommend that the inlet dredging program continue its evolution and that particular attention be paid to dredging enough material from the sand trap to mimic the sand moving forces of nature and maintain the up and down drift beaches. Finally, we recommend additional study of the effect of the spur on local surfing conditions, and if negative impacts are anticipated that the spur not be built.



The Corps dredge *Currituck*



Modern Rudee Inlet, 2001



South Jetty and timber weir

BEACHES AND WATERWAYS  
ADVISORY COMMISSION



# CROATAN BEACH

Three-quarter-miles long, Croatan Beach fronts one of Virginia Beach's premier oceanfront residential communities: Croatan. Beach life styles and a strong family orientation prevail in this close-knit neighborhood. High quality, beachy-upscale architecture in a densely developed, all residential subdivision give Croatan its unique character.

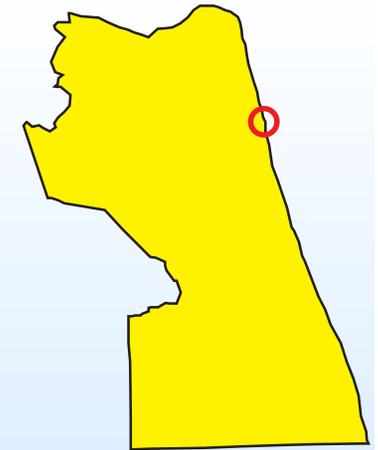
As a beach resource, Croatan's strengths include: a healthy and stable recreational beach, excellent beach access, a summer-use 300-space public beach parking lot, two of the best surfing areas in the City, lifeguard service, public bathroom facilities at the north and south ends of the beach, and a direct connection to the oceanfront bike path circuit.

Historically stable, localized beach erosion is a current problem in the northern portion of the beach, mostly related to the aging infrastructure of the Rudee Inlet jetty system. A study of repair alternatives for Rudee Inlet is underway and has been endorsed by the Beaches and Waterways Advisory Commission.

As a densely developed residential community adjacent to a wonderful surfing and recreational beach resource, day visitor behavioral issues have arisen. Day visitors, focused on a day at the beach or catching a wave before work, at times have lacked respect for private property and the neighborhood's right to peace and quiet. Noise, litter, public nudity, and minor acts of destruction of private property are typical symptoms of public beach use impacts on the neighborhood.

The community has also expressed the need for additional vehicular access; all beach users and residents must use a single road access, Croatan Road. In addition to calming traffic, an additional road access could enhance emergency services and storm evacuations.

Though accesses to this three-quarter mile beach are plentiful and well defined, signage and architectural improvements are warranted.



*Beach areas are documented as public*

*Healthy and stable recreational beach*

*Good access....five public access points*

*300 space parking lot with facilities*

*Family beach with lifeguards at surfing areas*

*Locking bike rack at each access point*

BEACHES AND WATERWAYS  
ADVISORY COMMISSION





Looking south from Rudee Inlet  
- August 2001

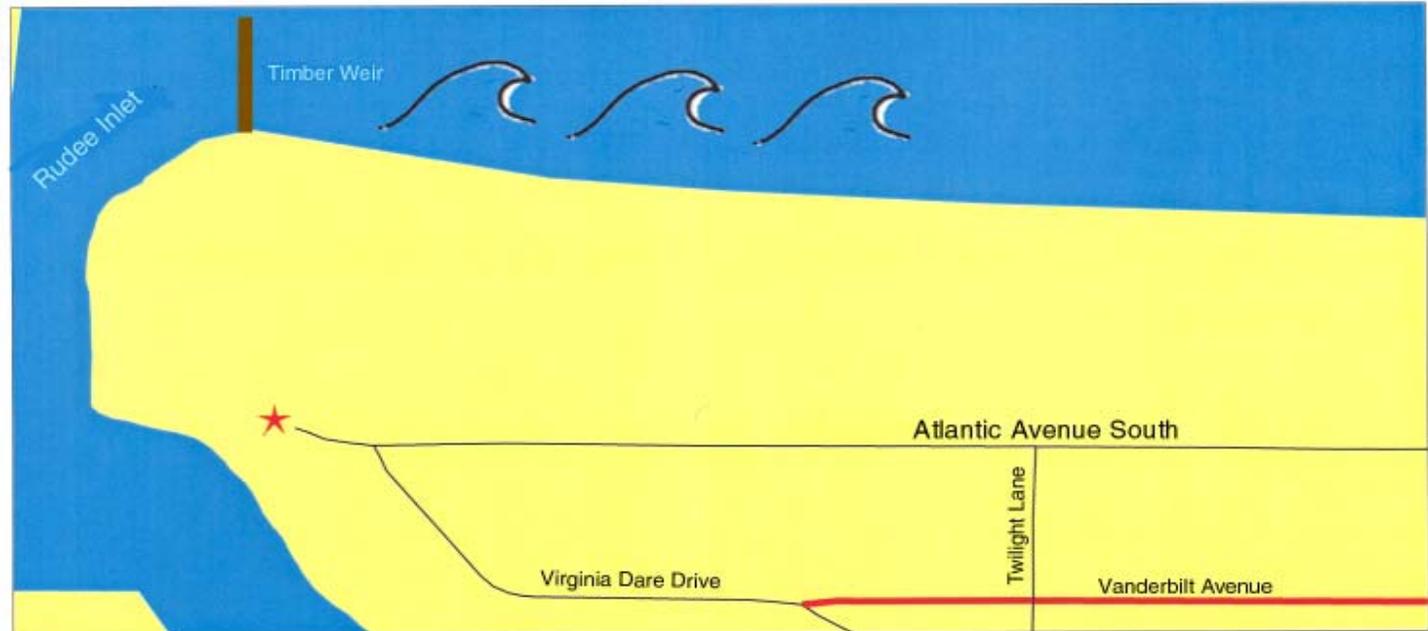


A great place to surf



A satisfying beach experience

**CROATAN**



### Public Parking

The Camp Pendleton public parking lot is located at the southern end of Croatan Beach. The lot is a summer-use facility, and provides 300 fee spaces for day beach visitors. Open from Memorial Day to Labor Day, between 8:00 a.m. and 7:00 p.m., the facility provides parking, portable and sheltered rest room facilities, and direct access to the beach and the southern surfing area. On-street parking is limited as most residents have extended private improvements to the pavement edge and parking is restricted to daylight hours.

### Beach Access

Marked and developed beach accesses exist at:

North end of South Atlantic Ave  
Croatan Road  
Aqua Lane

Maryland Avenue  
Lockheed Avenue  
Camp Pendleton parking lot

### Recreation

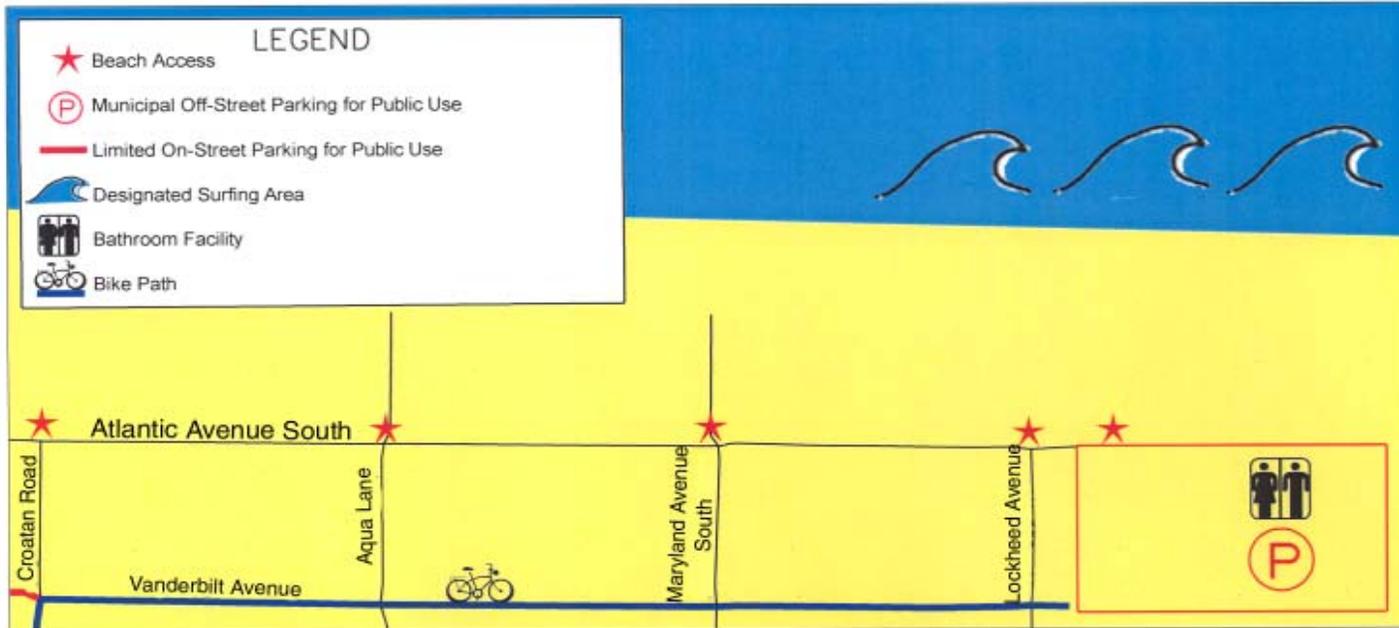
Fishing is a popular activity at this beach as angler's have access to Rudee Inlet where many varieties of fish can be found. Nearly all watersports are enjoyed at this beach, along with volleyball and other sand sports.

Surfing at Croatan Beach is restricted during normal beach hours in the Summer to two zones:

800 feet south of the Rudee Inlet South Jetty  
600 feet south of the Camp Pendleton fence

Lifeguards are present at this beach during the summer months at the following locations:

800 feet south of the Rudee Inlet South Jetty  
600 feet south and 600 feet north of the Camp Pendleton fence



Looking north from Camp Pendleton - August 2001



At your service



Camp Pendleton parking lot and Beach Access

## Bathroom Facilities

### Portable facilities are provided at:

- Rudee Inlet (North end of S. Atlantic Avenue)
- Camp Pendleton parking lot

## Beach Nourishment

Because of the natural northerly movement of sand along our Atlantic Coast, and due to the 'anchoring' characteristics of the Rudee Inlet jetty system, Croatan Beach has been historically stable. During the past three decades, the northern section of the beach had accreted as the result of less than adequate inlet maintenance dredging. Enhancements in inlet dredging have depleted the accumulated sand. Degradation of the inlet's aging infrastructure has led to localized erosion in the northern section of the beach. The combined effects on the northern portion of the beach is the source of alarm for adjacent property owners, prompt action to remedy the aging infrastructure has been requested.

## Beach Title Issues

Modern plats of Croatan do not indicate private ownership of the beach. The use of the beach by the general public has been uncontested for the City's entire history.

## Beach Maintenance

Litter receptacles are provided at each beach access, and are emptied daily during the summer months. Litter collection continues year round, though reduced in scope during the winter months. Beach grooming is limited at Croatan Beach. During the peak of the season weekly grooming service is attempted, though monthly service is the norm for the summer season. Off-season grooming is limited to storm event response and preseason preparations.



Rudee Inlet's aging timber weir and southern jetties

# CROATAN BEACH

## Recommendations

### *Top Priority*

As the localized erosion in the northern portion of the beach has an effect on both the storm protective characteristics of the beach and dune system and the recreational use of the beach, the Top Priority for Croatan Beach is to effect repairs to the aging Rudee Inlet jetty system.

### *Moderate Priority*

To minimize the impacts of public beach use on the densely developed neighborhood, the use of centralized parking lots (hubs) is recommended. Owing to the wonderful surf enjoyed at Croatan, the Camp Pendleton parking lot currently leased from the Commonwealth of Virginia should be purchased and converted to a year round facility. During the summer months, it should be an attended, fee imposed facility and there should be shielded portable handicap restrooms that would double as changing facilities for the public as a minimum. Concurrently, it is recommended that access to this lot be obtained through Camp Pendleton and serve as an additional emergency evacuation route for the neighborhood. Also, any future expansion of parking either at the Marine Science Museum or boat ramp facility, serve as a future public parking hub with jitney service to points of public access in Croatan. These recommendations combined would achieve a significant increase in accessibility for the public. In addition, the creation of public park site on the City property at Rudee Inlet should be considered.

### *Low Priority*

Enhancements in beach maintenance are recommended in accordance with the new program outlined in the Overarching Issues section of this plan.



The Camp Pendleton parking lot at the south of Croatan



Tight on-street parking

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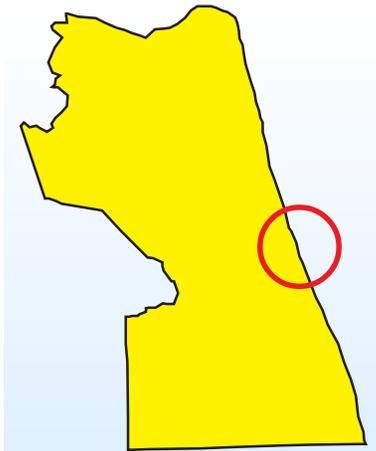
# SANDBRIDGE BEACH

Tucked away in the southern portion of the City, with five miles of open public beach, Sandbridge is a beach lifestyle haven. A blend of young families, mature residents and visiting tourists enjoy residing and relaxing in this unique community. Cottage architecture prevails, though newer redevelopment is trending toward larger, beach-front mansion styles.

A source of long controversy, erosion at Sandbridge Beach has been relentless – once sizeable dune systems vanished during the 1970's, damage to private property and public infrastructure from storm events had occurred with increasing frequency and cost during the 1990's. After years of study and debate, and a long and arduous process of resolving claims of private beach ownership, the beach was nourished for the first time in 1998 with 1.1 million cubic yards of sand mined from offshore deposits by a hopper dredge. The effects of the initial nourishment were significant; damages from storm events were minimized or eliminated, recreational opportunities were greatly enhanced, and depressed property values were restored. The benefits of the 1998 re-nourishment project are now diminished due to an annual erosion rate of 300,000 cubic yards of sand per year.

Federal authority to participate in a long-term beach nourishment program was adopted in 1992. However, federal polices have delayed implementation of this program. The first nourishment was accomplished as a City-sponsored project, utilizing funding from the Commonwealth, the City and special tax revenues (Special Service District (SSD)) from the Sandbridge community. Recent changes in federal policy have paved the way to initiate the program authorized in 1992; the first federal cost shared nourishment is funded and scheduled for the summer of 2002.

Access to Sandbridge Beach is excellent, there are 51 public beach accesses: 27 sandy paths, and 24 stairways over existing bulkheads distributed over this five-mile beach. Limited on-street parking is available, and three public parking lots and two public beach use facilities provide ample opportunities for non-resident visitation.



*Beach areas are documented as public*

*Funding in place (SSD) for ongoing replenishment program*

*Excellent access*

*Permanent public rest room facilities*





Little Island Fishing Pier



Sandfiddler Road



Guarded beach at Sandbridge Road



### Public Parking

Beachfront, on-street parking is available south of Pike Lane. The City operates three public parking lots at:

- Sandbridge Market – 40 spaces
- Sandbridge Beach Use Facility (Porpoise Lane) – 178 spaces
- Little Island Park – 600 spaces

Additional opportunities exist to increase beachfront, on-street parking north of Pike Lane, though current beach usage does not indicate the need for immediate enhancements.

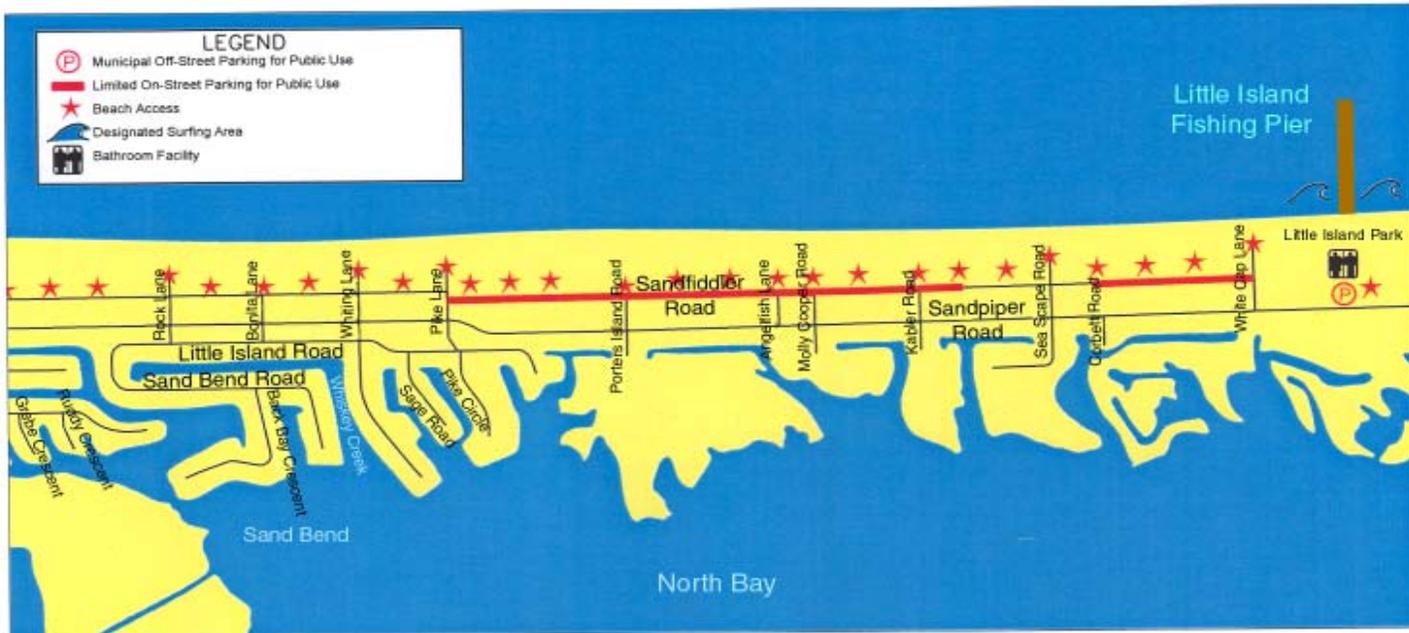
### Beach Access

Ample beach access exists throughout this community, at every cross-street and at designated rights-of-way in between. Accesses range from sandy paths across low dunes where bulkheads do not exist to timber stairways bridging bulkheads. Damage to the timber stairways from storm events often requires temporary closures for repair. As with most other beach segments, architectural and signage improvements for the beach accesses are desired.

### Recreation

As a remote location, frequented by beach vacationers and resident beach-goers, nearly every beach and water sport is enjoyed at Sandbridge Beach: swimming, kayaking, outrigger canoeing, surfing, skim boarding, wind boarding, kite boarding, fishing, sailing, jet skiing, volleyball, horseshoes; to name a few.

Surfing at Sandbridge Beach is restricted during normal beach hours in the summer on the weekends except in the designated surfing area at Little Island Park. Lifeguards are present between Sandbridge Road and Porpoise Lane and at Little Island Park during the summer months.



**Bathroom Facilities**

Public bathroom facilities and outdoor beach use showers are provided at Little Island Park and the Public Beach Use Facility at Porpoise Lane. Enhancements to the facility at Little Island Park are scheduled for construction in 2002.

**Beach Nourishment**

The authorized periodic nourishment of Sandbridge Beach, initiated by the City in 1998 and planned for first federal-local cost shared nourishment in 2002, was designed by the Corps of Engineers to fully arrest the long-term average effects of erosion. In the planned program format, an incremental widening will occur with each nourishment cycle, leading to a 'restored' beach of sufficient width and height to resist storm damage from all but rare events. It is anticipated that five nourishment cycles, on two to three year intervals, will be necessary to create the full dimension of the designed beach. The local share of this project is being derived solely from the Sandbridge community through self-imposed Special Service and Tax Increment Financing Districts.

**Beach Title Issues**

Similar to Chesapeake, Baylake and Cape Henry Beaches, modern subdivision plats encompassed land that, through the effects of shoreline retreat from erosion, included the sandy beach. Oceanfront landowners' interests appeared to extend across the beach and into the Atlantic Ocean. The chosen remedy to clarify and document a public interest in the beach to facilitate public stewardship was the dedication of public beach easements over the contested sandy area. All but 11 of the 243 private oceanfront property owners executed the permanent public beach recreation easement agreements; the remaining 11 were notified of the City's claim to public beach ownership.

**Beach Maintenance**

Litter collection for this entire beach is accomplished on a daily basis at the access points during peak summer months. The numbers of receptacles is reduced and collection is less frequent during winter months. Regular grooming of the beach is limited to the public beach facilities, and is generally done on a monthly basis during the summer months. Storm events often require special beach debris and road clearing efforts. The community has requested consideration for increased grooming activities to help shape and maintain the beach between nourishment cycles.



Old Coast Guard Station



Looking South - August 2001



Broad beach at Little Island Park



Effects of erosion at the South End - August 2001

# SANDBRIDGE BEACH

## Recommendations

In fairness to the 232-oceanfront property owners who voluntarily dedicated perpetual public beach recreation easements, it is recommended that a public interest in the beach at the remaining 11 properties be finally resolved. Voluntary dedications are preferred, but City Council should consider any means necessary to accomplish this purpose.

The program for beach restoration and nourishment is sound for Sandbridge Beach. It is recommended that City Council continue to support efforts to secure federal funding for this program, and that the Special Service District and Tax Increment Financing remain in place as the primary source of local funding for this program.

Architectural and signage enhancements for the beach accesses are desired to enhance usability and aesthetics and should be accomplished in conformance with the new program outlined in the Overarching Issues section of this plan. Attention to the accesses leading from Sandpiper Road, though the interior blocks, should be enhanced. These improvements should be programmed as part of a city-wide effort.

Finally, it is recommended that beach maintenance and grooming be enhanced through the creation of additional resources in staff and equipment dedicated for this purpose in non-Resort area beaches as outlined later in this plan.



Sand dune restoration project

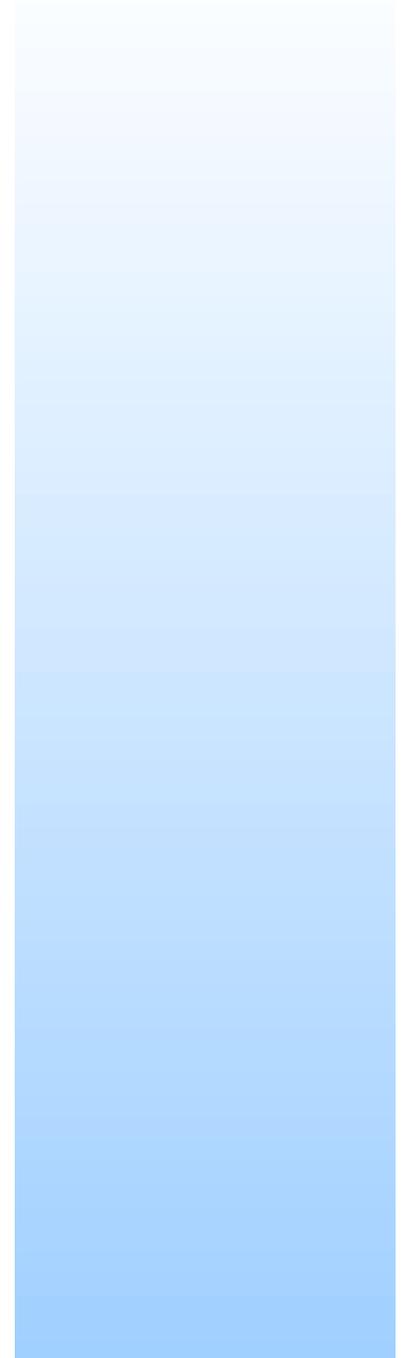


Typical bulkheads

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# OVERARCHING ISSUES



# OVERARCHING ISSUES

While each beach community within Virginia Beach has unique beach management issues and needs, there is a set of overarching issues that apply to many. These issues are as follows:

- Resolution of beach ownership;
- Adoption of a comprehensive beach restoration and replenishment program;
- Establishment of equitable and sensible funding mechanisms;
- Broadened beach maintenance activities;
- Beach access improvements;
- Signage enhancements;
- Increased parking;
- Definition of recreational use programs; and
- Creation of additional beach-use facilities.

## BEACH OWNERSHIP

Resolution of the claim of private ownership of our Bay Beaches is paramount to the Commission's overarching desire to steward our City's coastline. Without a clear public interest in the beaches at Chesapeake Beach and portions of Cape Henry Beach, these segments will continue to suffer from the effects of long-term erosion. As a result, public and private infrastructure will become more vulnerable to damage, property values will fall, and recreational opportunities will diminish.

As recommended, City Council should pursue clear documentation of the public's interest in beaches with titles clouded by claims of private ownership. This should be accomplished in the form of public recreation easement agreements, as was done in the case of Sandbridge Beach. If property owners are unwilling to execute such agreements, city staff should pursue necessary remedies to establish the beaches as public domain.



Chesapeake Beach - February 2002



Ocean Park Beach - February 2002



Cape Henry Beach - February 2002

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Resort Beach - February 2002



Croatan Beach - August 2001



Sandbridge Beach - August 2001

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## BEACH RESTORATION AND REPLENISHMENT

Beach restoration and replenishment, the addition of sand to reverse the effects of natural erosion, has proven to be an effective and environmentally sound method of beach stabilization. This Beach Management Plan contains recommendations for two new beach restoration and replenishment projects addressing Chesapeake Beach and Cape Henry Beach. Chesapeake Beach is in need of immediate attention. Here, title issues should be resolved expeditiously to facilitate a much needed restoration and replenishment program. Further, a program of restoration and replenishment for the central portion of Cape Henry Beach should also be immediately implemented. Dredged sand from Lynnhaven Inlet should be designated as the primary source of material.

We recommend that City Council continue to support the existing program of beach replenishment for Ocean Park, North End, Resort and Sandbridge Beaches. Due to Baylake Beach's relative stability, it requires no immediate action.

Croatan is a truly unique situation and City Council is urged to fund and maintain its weir and jetty system so that this beach will accrete and return to its naturally stable condition.

## FUNDING

In the opinion of the Commission, the restoration and replenishment of public beaches should be the responsibility of the government and should therefore be financed through federal, state, and local funds. If these funds are not available, then City Council should allow the residents of specific beach areas to elect to create a Special Service District.

All of our beaches west of the Lynnhaven Inlet are included in existing federal authority for replenishment under Section 933. This authority provides that beach quality sand removed from nearby federal navigation channels (Norfolk Harbor Channel System, including the Thimble Shoal Channel) can be placed on adjacent public beaches. Execution of this is under the condition that Virginia Beach acts as a local sponsor for the activity and contributes 50% of the incremental cost of such placement, over the original cost of disposing the material at the planned site (the Norfolk or Dam Neck Dredged Material Disposal Areas). After public interest has been documented, if the opportunity presents itself, we recommend that Virginia Beach enter into the appropriate agreements to become the local sponsor.

## BEACH MAINTENANCE

Routine beach grooming is limited to the Resort Area. We recommend its expansion to all beaches. All non-resort area beaches should be groomed at least weekly during the summer months, immediately prior to summer holidays, and after major storm events to remove seaweed, storm debris and reshape the beach. To accomplish this objective, additional resources need to be created or contracted for non-resort area beaches.



“Surf Rake” beach grooming tool

## BEACH ACCESS IMPROVEMENTS

While beach visitation and activities usually require mobility, the City of Virginia Beach has embraced accessibility for persons with disabilities. Beach accesses throughout the City consist of a variety of materials and methods. A standard, with consideration to specifications described by the Americans with Disabilities Act, should be developed for each of the three predominant types of accesses: at-grade walkways, bulkhead stairs, and dune crossovers. Where practical, access should include provisions for public and private vehicles to discharge passengers and beach gear prior to parking.



8th Street handicap access ramp and timber walkway

## SIGNAGE ENHANCEMENTS

Signage at beach accesses, except for those at the resort area, consists of a myriad of signs. Most of these convey negative messages through the overuse of the international “NO” symbol. Aesthetically, these signs are undesirable and the message points leave visitors with a negative view of our community.



Negative signage

The use of negative messages appears to have resulted from an effort to enforce standards of public behavior by the Police Department. Standards such as the consumption of alcohol, policing pet waste, and the prohibition of private vehicles on the beach are self-evident and need not be repeated hundreds of times throughout our City.

A more positive message should be conveyed in a more aesthetic manner. A consultant with experience in public relations, working with input from the Virginia Beach Police Department and other interested groups within the City, should develop new message points and a better design standard. The new standard should be retrofitted at all public beach accesses. It is anticipated that wood or some other non-standard material be used and that the signage would be placed in a manner which is less visually obtrusive.





Conflicting signage

## PARKING

The popularity of day beach visitation and use, coupled with the residential character of the adjacent neighborhoods on most of our City's coastline, creates parking demands and conflicts unique to these neighborhoods. As most beach segment communities are fully developed, the creation of additional parking opportunities in neighborhoods adjacent to our beaches is challenging without some adverse affect. We recommend better delineation of existing on-street parking with sensitivity and care for the neighborhood's appearance and character. In most cases this would involve the elimination of ambiguous and conflicting signs, and minor alterations in the right-of-way to clearly define existing parking opportunities.



Landscaping conflicting with No Parking on Pavement sign

We recommend review of all near beach streets to eliminate all unauthorized, private and "no parking" signs that contribute to the confusion. As this will yield few additional spaces, we recommend that remote parking facilities be developed for all beach segments with a system of mass transportation uniquely structured for beach visitation and use. This mass transit system should utilize vehicles with storage for beach use equipment, surfboards, coolers, and chairs. The transit system will also require improved drop-off points. Clearly, the addition of remote parking facilities would be on an as needed basis.

On the Bay Beaches this may involve acquisition of land south of Shore drive in existing commercial districts. For the North End, expansion and promotion of the Fort Story public beach parking facility is recommended, along with a program of utilizing existing public parking facilities in the resort area. At Croatan, this would involve the expansion of the Camp Pendleton parking lot to be a year-round facility, along with joint parking opportunities with expanded lots for the Virginia Marine Science Museum and the Owls Creek Boat Ramp.



The 300 space Camp Pendleton parking lot

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Immediate action should be directed toward Fort Story and Camp Pendleton expansions. Implementation of transit recommendations should follow a demonstrated need and willingness of the public to use the system. It is anticipated that a significant effort in public education and awareness would be critical to success.

## RECREATION

Every sort of beach and water sport is enjoyed on our City's beaches. Generally, these activities are harmonious. Surfing restrictions, though a source of continuing controversy, appear to have been thoroughly and adequately addressed along our ocean coast.

The unrestricted use of the Bay Beaches by day sail craft may warrant some review. Residents of the Bay Beaches have expressed concern regarding the unregulated storage of sail craft; both in terms of crowding the beach and the potential for danger. Storm activity may dislodge the craft from their anchorage resulting in airborne hazards. Accordingly, we recommend that the ordinance regulating the storage of sail craft on the North End beach be expanded to include unregulated beaches.

The provision of lifeguard services to all of the City's beaches should be considered. While Bay Beaches are not known for treacherous wave action or currents, these locations are frequented by young children and an ever-increasing number of seniors. Lifeguards can also minimize conflicts related to the eclectic uses of these beaches including sailing and jet-skiing. Such water sports can often conflict with or threaten the safe enjoyment of the water by swimmers. Some residents have expressed particular concerns related to the launching of personal watercraft from our beaches. This issue needs further study and review.

## BEACH USE FACILITIES

The opportunity for the creation of additional beach use facilities on our residential beaches is limited. The Fort Story and Camp Pendleton facilities should be permanent and open year-round. Any new parking facility created for beach use should include bathrooms, changing, and outdoor shower facilities to enhance the quality of beach visits, reduce pollution and minimize impacts on the neighborhoods hosting the visitors. We urge City Council to approach the Navy to acquire the Navy Beach Club at 67th Street. As an existing beach use facility, conversion to City management would have limited impact on the surrounding neighborhood.



Unregulated sail craft storage on Ocean Park Beach



The Lynnhaven Boat Ramp and Beach Use Facility

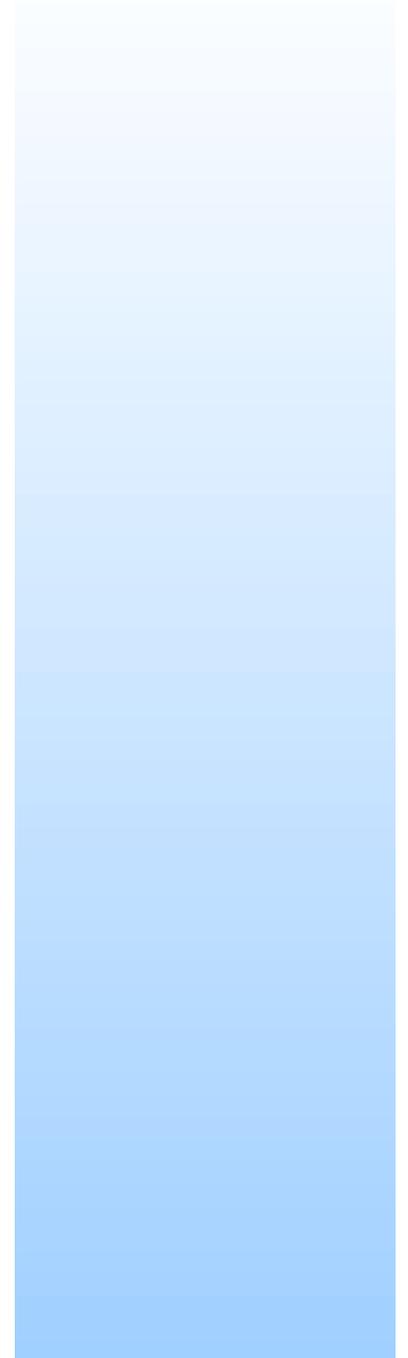


Navy Beach Club

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# RECOMMENDATIONS



# RECOMMENDATIONS

## GROUPING AND RANKING

Each beach segment or inlet section of this plan concludes with its own set of recommendations. This section, broader in context, groups the Beaches and Waterways Advisory Commission's beach management recommendations into two general categories: protection and usage. Acknowledging that the acceptance of this plan by the City Council may lead to staggered implementation of its recommendations, this section also provides a description and prioritization of the recommendations that should be given highest consideration.

### PROTECTION

Beaches protect public and private infrastructures from the effects of erosion and storm damage. The primary benefits derived from this function are storm damage threat reduction, preservation of tax base, quality of life and economic vitality. The recommendations in this plan that directly relate to maintaining our beaches include beach ownership, beach restoration and maintenance, inlet management, and funding.

As mentioned, public interest must exist, either by easement or underlying fee, at our beaches to warrant the expenditure of public funds for their maintenance. Areas where the public's interest is clouded by claims of private ownership or exclusive usage are not legally eligible for publicly funded restoration or replenishment.

We recommend maintenance of our beaches through restoration and replenishment, the addition of beach-quality sand to reverse or neutralize the effects of erosion. This method has proven to be cost effective, efficient and environmentally sound.

The Commission feels that a beach monitoring and surveying program is critical to the management of our bay and oceanfront beaches. The Commission recommends the reinstatement of a beach monitoring and surveying program along with the statistical analysis required to interpret the data.

Beaches are public resources, similar to roadways and public recreation facilities. The Commission believes that funding for beach restoration and replenishment should come from public sources, whether federal, state, or local. As there are many competing needs for government funding, it may not be readily available for certain beaches in need of immediate attention. City Council may wish to work with beach communities to create Special Service Districts, as was the case in Sandbridge Beach.



Ash Wednesday Damage to Boardwalk



24th Street after Ash Wednesday



Typical pre-restoration nor'easter in Sandbridge

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Shaping the Resort Beach

## USAGE

Access to and usage of our public beaches, valued and cherished public resources, is important. Virginia Beach is blessed with nearly 30 miles of bay and ocean beaches, an attribute that few other municipalities possess. The recommendations in this plan related to access and usage include beach maintenance, access improvements, signage enhancements, parking, recreational programs, and beach-use facilities.



14th Street Beach Access

Beach maintenance refers to the grooming of the beaches and the removal of litter, flotsam, and debris. Maintenance at the Resort Beach is excellent. Grooming and litter removal occurs daily during the summer months. We recommend that the program be expanded to provide similar services to the non-resort area beaches.

Access to our beaches is adequate with more than 200 public right-of-ways to the beach and water. Many of the accesses have been improved and are regularly maintained. However, many accesses in Sandbridge Beach, Croatan Beach, and the Bay Beaches are simple pathways leading to the beach without improvements. We recommend the city adopt a standard of access improvements and standard signage that would be applied to all beach sections.



Little Island Park at the south end of Sandbridge

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Numerous on-street and municipal parking opportunities are available. The Resort Beach and Sandbridge Beach contain the largest number of parking spaces. Fewer parking opportunities are available at other beaches because of the residential nature of the adjacent communities. In several beach segments parking supply does not meet demand. This parking demand is likely to increase in the future. Accordingly, we recommend consideration of improvements to the Fort Story and Camp Pendleton parking facilities. We also recommend consideration of off-site parking facilities and a unique system of beach-access public transit. These parking facilities should also include full beach-use amenities such as rest rooms, changing areas and outdoor showers. The Commission recognizes that whenever density in a beach neighborhood is high, there is a potential for behavioral problems which impact the residents. Without limiting the public's access to the beach, the Commission recommends that when these problems are present, a program of increased enforcement of existing code and development of a volunteer behavior modification program similar to that at the Resort Beach be considered.

The Commission realizes the importance of public access to the state and federally managed beach areas that are contiguous to City beaches. The Commission recommends that additional public access to these beaches be actively pursued through appropriate channels.

Lifeguards are provided at the Resort Beach and some sections of Croatan and Sandbridge beaches. With an eye toward enhancing safety and minimizing potential conflicts among beach users, we recommend that lifeguard services be expanded to all beaches. The number of lifeguards and their mobility should be consistent with beach population and usages. The regulation of storage and use of all water craft on our beaches should be explored fully in response to concerns expressed by residents.

## RANKING

In response to current conditions and needs, we rank the following recommendations as top priorities for immediate consideration by City Council:

### 1. Resolution of beach ownership issues and beach restoration for Chesapeake Beach;

Conditions at Chesapeake Beach have deteriorated. Erosion there is chronic and ongoing. Damage to public and private infrastructures is increasing in magnitude and frequency. City staff has been working with civic leaders in Chesapeake Beach. It is critical that the ownership issues at Chesapeake Beach be resolved. As with Sandbridge, the focus of Staff's effort has been on obtaining voluntary dedication of land and construction easements to establish a public interest. Efforts at Chesapeake Beach have seen little success. A minority of the property owners claiming an interest in the beach have stated a willingness to dedicate such easements. City Council should endorse a program of beach restoration and replenishment if the owners collectively elect to dedicate such easements. Acknowledging that chances of participation by each and every owner claiming an interest in the beach are not likely, we encourage City Council to authorize staff to acquire the necessary public interest in the beach. We believe that funding for these efforts should come from existing federal, state, and local revenues. However, if such funding is not available, the Chesapeake Beach community should be encouraged to establish a Special Service District for this purpose.

### 2. Resolution of beach ownership issues and beach restoration for Cape Henry Beach;

Our second recommendation is for the City to resolve remaining title issues on Cape Henry Beach. While the erosion problem is somewhat less severe, the value of the public and private infrastructure at risk of erosion and storm damage is high. Beach restoration and replenishment for Cape Henry could be accomplished at minimal cost through the cooperative program with the Army Corps of Engineers for maintenance dredging of the Lynnhaven Inlet.



Lifeguards at Sandbridge



Western portion of Chesapeake Beach



Cape Henry Beach - August 2002

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Rudee Inlet timber weir

**3. Repair to the weir and aging infrastructure at Rudee Inlet as expeditiously as possible;**

Our third highest priority is the repair of aging infrastructure at Rudee Inlet as outlined in the Rudee Inlet Management Study of December 2001. The deterioration of the timber weir and jetty structures has a negative impact on Croatan Beach. The infrastructure repair should be a high priority for City Council because restoring and preserving the stability of Croatan Beach will minimize maintenance dredging requirements for safe navigation.

These three highest priorities represent the immediate needs for Virginia Beach. Once they are accomplished, the following actions should be considered:



Rudee Inlet

- 4. Fort Story and Camp Pendleton parking lot improvements with year-round operation;**
- 5. Improvements and standardization of treatment for beach accesses;**
- 6. Enhanced and standardized signage for all beach accesses;**
- 7. Enhanced beach maintenance outside of the Resort Beach;**
- 8. Regulation of beach storage and launching of watercraft on all beaches.**

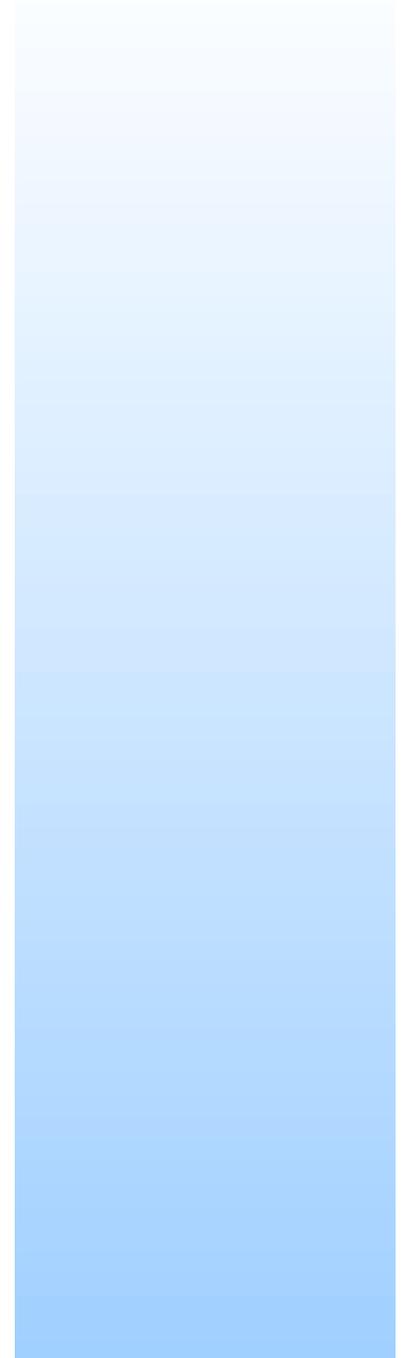


Cape Henry Lighthouses at Fort Story

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# GLOSSARY



# GLOSSARY

**Accretion** - Deposition or accumulation of sediment, usually sand, which is evident by the seaward advance of a shoreline indicator, such as the high water line, berm crest, or vegetation line. This action causes the beach to become wider; opposite to erosion.

**Bar** - Submerged mound of sand that generally runs parallel to the shore and causes waves to break before reaching the beach.

**Beach Nourishment** - Sand artificially placed on the beach, usually by pumping sand from the sea bottom or hauling of sand by truck from upland sources, to replace that being lost alongshore or offshore.

**Borrow Pit** - Area that contains desired material, such as sand, to be excavated and transported to another site.

**Bulkhead** - A rigid structure with vertical walls built parallel to the shoreline to serve as barriers to wave attack and prevent storm surge flooding of upland areas; constructed out of treated wood, corrugated steel, Poly Vinyl Chloride (PVC), or other materials.

**Bypass Dredging** - Using a dredge at an inlet or river mouth to transfer the littoral sediments to mimic the natural shoreline sediment motion.

**Culvert** - A pipe crossing under a road or embankment to convey storm or river water.

**Downdrift** - The direction of predominant movement of littoral materials, usually sand, along a shoreline; the receiving zone of such movement. For example, the Croatan Beach is down-drift of Sandbridge Beach because sand moves south to north.

**Dredging** - The action of deepening harbors and waterways with various machines equipped with scooping or suctioning devices.

**Dune** - A ridge or mound of loose, wind-blown material, usually sand.

**Dune Augmentation** - The act of making a dune greater in size or volume to enhance its storm protection function.

**Dune Cross-over** - Light construction that provides pedestrian access across a dune without trampling the natural vegetation.

**Ebb Tide** - The period of tide between high water and the succeeding low water; a falling tide.



Bulkhead at Sandbridge Beach



Dune at Ocean Park



89th Street Dune-Crossover

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Weeks Marine Hopper Dredge  
*R.N. Weeks*



Rudee Inlet Jetty System



*Rudee Inlet II* dredging in the Sand Trap

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**Erosion** - The wearing away of land by the action of natural forces. On a beach, the loss of sand by wave action, tidal currents, or wind.

**Estuary** - The part of a river or basin that is affected by tides.

**Flotsam** - Waterborne debris that comes to rest on the shoreline.

**Hopper Dredge** - A self-propelled ship used to evacuate materials from one location (either a borrow site or a channel) and transport the material to another (either a beach or a dredged material disposal site).

**Jetty** - On open seacoasts, a structure extending into a body of water, which is designed to prevent shoaling of a channel by littoral materials and to direct and confine the stream or tidal flow. Jetties are built at the mouths of rivers or tidal inlets to minimize the effects of the inlet or mouth on adjacent shorelines and calm the waters in the channel.

**Littoral Drift** - The sedimentary material (sand) transported along the shoreline by the action of waves and currents.

**Mean Low Water** - The water surface elevation of the normal low tide.

**Mean Sea Level** - The water surface elevation of the normal mid-tide.

**Meander** - The movement or relocation of a waterway or inlet under the forces of currents and in response to littoral processes.

**Nearshore** - The underwater area close to the beach, often characterized by sand bars, where sediment is actively being moved by waves and currents. This zone typically extends to a depth of twenty-five (25) to thirty (30) feet along the Atlantic Coast and is considered part of the total beach system.

**Reach** - A segment of a waterway or beach.

**Replenishment** - The placement of sand to replace that which is lost to erosion.

**Restoration** - The placement of sand to recreate a prior beach dimension.

**Sand Trap** - Area where sand is allowed to deposit until dredged and deposited in another location. At Rudee Inlet, the sand trap is located between the timber weir and the channel, which provides a safe area for the City's dredge *Rudee II* to operate.

**Seawall** - Vertical or near vertical shore-parallel structures designed to prevent upland erosion and storm surge flooding. Seawalls are generally massive concrete structures placed along urban beaches.

**Section 933 Project** - Segment of the 1986 Water Resources Development Act (WRDA) that specifies that the U.S. Government will pay fifty (50) percent of the cost differential between beach placement and overboard disposal of material dredged from federal navigation projects.

**Shoal** - A large deposit of sand, generally created by currents, that can be an obstruction to navigation and cause wave refraction.

**Sluice** - A man-made channel for conducting water with a valve or gate to regulate the flow.

**Special Service District** - An area where surcharges to real estate taxes and/or room rental taxes are levied and used for a special purpose within the district's boundaries: sand replenishment at Sandbridge Beach.

**Spur** - An oblique extension to a jetty designed to intercept or slow littoral processes. The proposed spur on Rudee Inlet's north jetty is designed to restrict sand from entering Rudee Inlet during northeast storm events.

**Tax Incremental Financing** - The act of capturing increased revenue derived from increased assessments within a defined district, and utilizing those captured revenues for specific purposes within the district: sand replenishment at Sandbridge Beach.

**Traffic Calming** - The act of using a series of traffic features (ie. Traffic lights, stop signs, speed bumps, etc.) to reduce speed and reduce traffic density passing through an area.

**Updrift** - The direction opposite that of the predominant movement of littoral materials; the origin of such movement. For example, Sandbridge Beach is up-drift of the Croatan Beach because sand moves south to north.

**Weir** - A structure with a low section over which littoral drift moves into a pre-dredged deposition basin (ie. Sand trap).



Seawall at the Resort Beach



Conceptual photo showing the effect of the proposed spur on Rudee Inlet's north jetty



Rudee Inlet Timber Weir

BEACHES AND WATERWAYS  
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