Key Marina Planning Issues, La Paz, Mexico

Neil Ross

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Key Marina Planning Issues

Neil Ross Presentation
La Paz, Mexico

I. MARINA SITE SELECTION

Each marina and boatyard in the world is site specific and offers a varied range of services to meet their market needs.

A. Important Site Selection Characteristics

No two marinas are identical, but all share these common site characteristics and business needs.

1. **Protected location**

Storm and wake wave protection are absolutely essential to all marina for survival, boater comfort and business return on investment. Without storm and wave protection no marina can survive.

Location factors to consider:
- Naturally protected harbor available
- History of storm winds, waves and floods
- Whether a cost effective breakwater is technically possible

2. **Water access**

Boats must be able to safely and easily get into and out of the marina docks. Most protected marina sites are shallow with sand and silt deposits needing dredging.

Access variables to consider:
- Whether key boating routes are nearby
- Water basin depth depends on size and type of boats expected. Depth must accommodate the largest boat draft plus extra safety depth at lowest tide level. Example: a 50' power boat needs 8.5' water depth, but a 40' sailboat needs 13'
- Initial dredging needs; avoid costly dredging where possible
- Dredge material disposal options: land, beach, off shore
- Sand movement and sedimentation patterns that may require maintenance dredging

3. **Environment**

Marinas and boating activities should minimize changes to the natural landscape, have operations compatible with the existing environment, reduce most negative impacts and enhance positive beneficial values when possible and practical.

a. Environmental issues to consider:

• Water circulation and flushing adequate to keep marina waters clean - Site and design marinas such that tides and/or currents will aid in flushing of the site or renew its water regularly.

• Water quality assessment - Study water quality as part of marina siting and design.

• Habitat assessment - Site and design marinas to protect against adverse effects on shellfish resources, wetlands, submerged aquatic vegetation, or other important riparian and aquatic habitat areas as designated by local, state, or federal governments.Protected species, important habitats and reefs in or near site

b. Preexisting conditions to consider:

• Historic and archaeological sites
• Presence of urban runoff, sewer discharge and other non-marina contamination sources
• Previous uses of land and water; existing contaminated areas
• Reuse previously developed shores where construction impacts have already occurred

c. Prepare strategies for reducing boating impact on fragile areas

• Cluster marina development and boat services for easier environmental management
• Designated anchorages and landing points with managed trails
• Demonstrate and communicate that the real impacts from boats and marinas are limited and often less important than at first glance
• Good environmental management practices have been proven to reduce negative impacts, and usually save time and money over the long run, so utilize them.

4. **Market demand**

All marinas must get a good financial return on the investment cost within a reasonable time to be successful.

Market factors to consider:

• Existing and projected market for different boats and sizes
• If built, will enough boats come?
• The full range of services likely to be needed for expected boat market
• Competing marinas, boat fueling, boatyards nearby
• Future boat market changes over next 30 years
• Develop and build marina in phases as market expands

• Available funding, bonded and guaranteed for construction build out
• Local boat use seasonal or year round
• Percent of boats arriving by water or over land on trailer
• Retirement or second home communities often bring own boats for seasonal winter boating and summer dry land storage
• Location near high value tourist sites to visit by boat, such as Gulf islands
• Synergy with other tourist industries, such as charter boat sport fishing

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All marinas have basic utility and access needs, some may already exist and be available or need to be built.

Infrastructure requirements to consider:

• Roads and parking
• Electricity
• Sewer system or onsite disposal/treatment
• Telephone, cable TV, Internet cable
• Fuel supply: gasoline, diesel and lubricants
• Transportation of food, supplies, boat equipment, fuel, and boat trailers

Marina planning tips:

• Use of existing infrastructure is economically better than creating new
Example: design marina as part of resort development or in city like La Paz
• Include marina and boating access as part of city long-term waterfront development plan
• Larger marinas with wide range of services are economically more profitable
• Small marinas with few services are more successful where associated with other uses and services

6. **Community interaction**

Every marina brings potential benefits to the area's quality of life and economy, and needs some level of community involvement and acceptance, in addition to government construction permits.

Community interests and concerns to consider:

• Local community leaders participate in planning the marina; get their support
• Marina development replaces other uses: fishing, farming, aquaculture, and swim beach
• Availability of local labor and skilled technicians
• Number to be employed by the marina and onsite businesses
• Services to be offered by outside businesses and contractors
• Applicable laws and regulations affecting marina site selection
• Construction permits approved by local, state and federal regulatory agencies
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• Understand that even with wide input from many people and experts, there will be a wide range of views, often conflicting, that require effective and fair negotiation.
• Mistakes can happen in ways that developer and regulatory agencies interact locally leading to misunderstand and opposition
• Local information and viewpoints can help plan the marina and may save on costly mistakes

Example: In my own state of Rhode Island, after decades of studies of the ecosystem in Narragansett Bay and years of planning, the final coastal master plan basically said that:
• Marinas and boating are important to our economy and way of life
• Marinas should be concentrated where they already exist and in already developed ports
• Undeveloped harbors should be protected and not developed
• Existing marinas are encouraged to modernize and expand.

B. Common Marina Sites

If possible, weave these images into the above section, this presentation runs the risk of going on too long. Better to stimulate discussion than to try to answer any and all questions in advance

• **Historic shipyard, ferry landing** - continues nautical waterfront with modern use.
Example: Varadero Shipyard

• **Large tourism development** - enhance value of land uses, condos, hotel
Example: Marina Palmira

• **National parks** - provide boating recreational access
Example: Lake Mead, Arizona & Nevada, USA

• **Under utilized fishing port** - expand economy (perhaps displace fishing)
Example: Los Cabos

• **Abandoned naval base** - convert to civilian use

• **Urban commercial waterfront** - renovate economy and provide water access
Example: San Francisco, California, USA

• **Industrial waterfront** - rehabilitate contaminated waterfronts for public use
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• **Recreational harbor** - cluster boat storage and services
Examples: Marina Santa Cruz, Marina de La Paz, Marina de Don José, Varadero Shipyard

Marina design, operation and income depend on many variables with some beyond the control of the marina planner and operator.

C. Marina Site Selection Roundtable Discussion

II. MARINA DESIGN & CONSTRUCTION

Successful marinas require a balanced combination of location, design, financing, management, services and operations for each site-specific boating market and environment. All of these must fit together in the selected site through a well-prepared engineering design plan. Construction contractors must prepare the site and build the planned features in ways that are both protective of the environment and cost effective.

Consider:
- Use good marina design engineer/architect, licensed, specifically trained and experienced in successful marina developments
- Have baseline information available on wind, wave, geology, water depth, environment, laws, regulations, financing

A. General Types of Marinas

Marina classification - based on market study, decide exactly what type of marina facility will be built. Marinas usually serve multiple functions to the boat owner and user.

- **Homeport marina** - where boats are kept and return to during boating season, but leave for trips elsewhere; limited boat services beyond fuel, water and pumpout, retail ship store
  Examples: Marina de La Paz, Marina de Don José

- **Tourist destination marina** - marina located in tourist destination harbor, typically provides short-term slips and limited services usually limited to fuel, and emergency repairs. Example:

- **Stop over marina** - transient marina along popular waterway routes, primarily provides overnight slips and limited services usually limited to fuel, and emergency repairs
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- **Boatyard** - primarily provides boat repair and maintenance services, boat building, boat hauling and launching, generally no slip rental or fuel
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- **Combination marina & boatyard** - business combination of slip rentals and boat repair services. Example:

- **Yacht club** - private club marina docks limited to members, may sell fuel, no other boat services. Example:

- **Venetian docks** - boat slips built on canals in front of residences
  Example: Puerto Loreto

• **Anchorage** - boats anchored offshore in harbor, guest moorings, use shuttle boat or dinghy to shore
Example: La Paz harbor

B. Marina Services

No two marinas offer the same combination of services from the wide range existing.
Select range of services to offer expected boater market

[See and use table 3]

• Design for appropriate buildings: administrative office, dock master office, retail store, boat repair, rest rooms w/showers, storage, boat bottom washing

• Type of boat handling operations, include launch ramp with trailer, marine railroad, mobile straddle lift, crane, hydraulic lifts, hydraulic trailer, fork lift truck

C. General Marina Pollution Management Strategies

• **Source control**
- Stopping a polluting practice,
- Switching to cleaner practice or product,
- Using less of the polluting product,
- Immediately collect pollutant as it is produced so it never gets onto the ground, in the air or water.

These strategies are often the most effective ways to prevent pollution and the least costly to do.
Example: dustless hull sanding machine

• **Reduce pollution movement**
Once pollutant has fallen on the ground, use traps, filter and/or absorption material to prevent or reduce amount entering the water. These strategies are less effective then source control and can be more expensive to install and maintain.
Example: rain runoff filter and trap

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Spill or pollution has entered the water environment and must be collected, absorbed and removed before much harm to environment can result.
This is the least effective strategy, recovers the least amount of pollution, damage has begun and is the most expensive alternative. Government fines and negative publicity often results from spills.
Example: fuel spill boom and absorption

D. Environmental Design Considerations

Design marina to facilitate environmental operation, management and control of pollutants

- **Habitat modification, replacement, creation** - Constructing any marina will modify the original habitat. The goal is to minimize the negative impacts and to encourage positive impacts while accepting that some change will occur.

  - Underwater marina structures in effect create habitat: artificial reefsdevelop on pile posts, stone rip rap, floating docks, and breakwaters

- **Shoreline stabilization** - Where shoreline or streambank erosion is a nonpoint source pollution problem, shorelines and streambanks should be stabilized. Vegetative methods are strongly preferred unless structural methods are more cost-effective, considering the severity of wave and wind erosion, offshore bathymetry, and the potential adverse impact on other shorelines, streambanks, and offshore areas.

  - Use siltation control during construction

  - Use natural beach and shores instead of bulk heading and filling

- **Stormwater runoff controls** - Implement effective runoff control strategies that include the use of pollution prevention activities and the proper design of hull maintenance areas.
  Examples: vegetated buffers, grass traps, traps in drains

- **Fuel dock location** - Design fueling stations to allow for easy boat access and ease in cleanup of spills.

  - Fueling: storage underground or above, access by fuel delivery truck

- **Boat sewage management** - Install pumpout, dump station, and restroom facilities where needed at new and expanding marinas to reduce the release of sewage to surface waters. Design these facilities to allow ease of access and post signage to promote use by the boating public.

  - Restrooms, pumpout type and location

  - Convenience is secret to success - fuel dock, every slip, and regular pumpout

E. Best Management Practices that need to be applied at the time of Design and Construction:

Example - Sewage facility management

> *Install boat sewage pumpout, and restroom facilities where needed at new and expanding marinas to reduce the release of sewage to surface waters. Design these facilities to allow ease of access and post signage to promote use by the boating public.*

Boat sewage can be a problem when dumped overboard without any treatment. Although the volume of sewage discharged from boats is not as massive as a typical sewage treatment plant outfall, boat sewage is very concentrated and can add to the overall problem of fecal coliform bacteria loading to the water body. Boat sewage also adds extra nutrients that use dissolved oxygen and can stimulate the growth of algae, which in the worst case can grow so fast that they use oxygen needed by fish and other organisms. When untreated sewage goes overboard, it can contaminate shellfish, leading to potentially serious human health risks.

BMPs that should be considered and used where appropriate:

- *Install pumpout facilities where needed. Use a system compatible with the marina's needs (fixed-point systems, dump stations for portable toilets, portable systems, dedicated slipside systems).*
- *Provide pumpout service at convenient times and at a reasonable cost.*
- *Keep pumpout stations clean and easily accessible, and consider having marina staff do pumpouts.*
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- *Provide restrooms at all marinas and boat ramps.*
- *Consider declaring marina waters to be a "no discharge" area.*
- *Establish practices and post signs to control pet waste problems.*
- *Avoid feeding of wild birds in the marina.*
- *Establish no discharge zones to prevent any sewage from entering boating waters.*

F. Marina Design and Construction Roundtable Discussion

III. MARINA & BOAT OPERATIONS

Operating a marina business is a challenge.

Operators and managers have to conduct as a dynamic balancing act in order to:

- Attract and meet the needs of boating customers,
- Hire and manage employees,
- Administer the business,
- Satisfy laws and regulations,
- Protect and enhance the environment,
- Boost the local economy,
- Promote boating tourism,
- Keep boating fun,
- Encourage community goodwill,
- Protect boats from harm/damage,
- Have 24-hour security,
- Pay bills on time, and
- Make a reasonable profit for the owners and investors.

In addition, the marina operator must be vigilant to protect against approaching storms, continually maintain the marina facility and docks, respond to changing boating markets, and plan for future modernization and growth.

A. Environmental Management

- **Petroleum control** - Reduce the amount of fuel and oil from boat bilges and fuel tank air vents entering marina and surface waters.

- **Liquid material management** - Provide and maintain appropriate storage, transfer, containment, and disposal facilities for liquid material, such as oil, harmful solvents, antifreeze, and paints, and encourage recycling of these materials

- **Solid waste management** - Properly dispose of solid wastes produced by the operation, cleaning, maintenance, and repair of boats to limit entry of solid wastes to surface waters.

- **Fish waste management** - Promote sound fish waste management through a combination of fish-cleaning restrictions, public education, and proper disposal of fish waste.

- **Sewage facility management** - Install pumpout, dump station, and restroom facilities where needed at new and expanding marinas to reduce the release of sewage to surface waters. Design these facilities to allow ease of access and post signage to promote use by the boating public.

- **Maintenance of sewage facilities** - Ensure that sewage pumpout facilities are maintained in operational condition and encourage their use.

- **Boat cleaning & operation** - For boats that are in the water, perform cleaning operations to minimize, to the extent practicable, the release to surface waters of (a) harmful cleaners and solvents and (b) paint from in-water hull cleaning

- **Boat operation** - Manage boating activities where necessary to decrease turbidity and physical destruction of shallow-water habitat.

- **Public education** - Public education, outreach, and training programs should be instituted for boaters, as well as marina owners and operators, to prevent improper disposal of polluting material.

B. **Best Management Practices for marina operation:**

Example - PETROLEUM CONTROL

Reduce the amount of fuel and oil from boat bilges and fuel tank air vents entering marina and surface waters.

Although more than half of the oil that spills into the water evaporates, less than a cup of oil can create a very thin sheen over more than an acre of calm water. Small amounts of oil spilled from numerous boats can accumulate to create a large oil sheen, which blocks oxygen from moving through the surface of the water and can be harmful to animals and larvae that must break the surface to breathe. The hydrocarbons in oil harm juvenile fish, upset fish reproduction, and interfere with the growth and reproduction of bottom dwelling organisms. Oil and gas ingested by one animal can be passed to the next animal in the food chain, ultimately resulting in a risk to human health. In a marina, petroleum spills also dissolve the white Styrofoam in floats and docks and discolor boat hulls, woodwork, and paint. Gasoline spills, which evaporate quickly, are also a safety problem because of the flammability of gasoline.

BMPs that should be considered and used where appropriate:

- *Promote the installation and use of fuel/air separators on air vents or tank stems of inboard fuel tanks to reduce the amount of fuel spilled into surface waters during fueling*

- *Avoid overfilling fuel tanks*

- *Provide doughnuts or small petroleum absorption pads to patrons to use while fueling to catch splashback and the last drops when the nozzle is transferred back from the boat to the fuel dock.*

- *Keep engines properly maintained for efficient fuel consumption, clean exhaust, and fuel economy. Follow the manufacturer's specifications.*

- *Routinely check for engine fuel leaks and use a drip pan under engines.*

- *Avoid pumping any bilge water that is oily or has a sheen. Promote the use of materials that either capture or*

digest oil in bilges. Examine these materials frequently and replace as necessary.

- *Extract used oil from absorption pads if possible, or dispose of it in accordance with petroleum disposal guidelines.*

- *Prohibit the use of detergents and emulsifiers on fuel spills.*

C. Marina Operations Roundtable Discussion

Key Marina Planning Issues

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III. MARINA & BOAT OPERATIONS

Operating a marina business is a challenge.

Operators and managers have to conduct as a dynamic balancing act in order to:

- Attract and meet the needs of boating customers,
- Hire and manage employees,
- Administer the business,
- Satisfy laws and regulations,
- Protect and enhance the environment,
- Boost the local economy,
- Promote boating tourism,
- Keep boating fun,
- Encourage community goodwill,
- Protect boats from harm/damage,
- Have 24-hour security,
- Pay bills on time, and
- Make a reasonable profit for the owners and investors.

In addition, the marina operator must be vigilant to protect against approaching storms, continually maintain the marina facility and docks, respond to changing boating markets, and plan for future modernization and growth.

A. Environmental Management

- **Petroleum control** - Reduce the amount of fuel and oil from boat bilges and fuel tank air vents entering marina and surface waters.

- **Liquid material management** - Provide and maintain appropriate storage, transfer, containment, and disposal facilities for liquid material, such as oil, harmful solvents, antifreeze, and paints, and encourage recycling of these materials

- **Solid waste management** - Properly dispose of solid wastes produced by the operation, cleaning, maintenance, and repair of boats to limit entry of solid wastes to surface waters.

- **Fish waste management** - Promote sound fish waste management through a combination of fish-cleaning restrictions, public education, and proper disposal of fish waste.

- **Sewage facility management** - Install pumpout, dump station, and restroom facilities where needed at new and expanding marinas to reduce the release of sewage to surface waters. Design these facilities to allow ease of access and post signage to promote use by the boating public.

- **Maintenance of sewage facilities** - Ensure that sewage pumpout facilities are maintained in operational condition and encourage their use.

- **Boat cleaning & operation** - For boats that are in the water, perform cleaning operations to minimize, to the extent practicable, the release to surface waters of (a) harmful cleaners and solvents and (b) paint from in-water hull cleaning

- **Boat operation** - Manage boating activities where necessary to decrease turbidity and physical destruction of shallow-water habitat.

- **Public education** - Public education, outreach, and training programs should be instituted for boaters, as well as marina owners and operators, to prevent improper disposal of polluting material.

B. **Best Management Practices for marina operation:**

Example - PETROLEUM CONTROL

Reduce the amount of fuel and oil from boat bilges and fuel tank air vents entering marina and surface waters.

Although more than half of the oil that spills into the water evaporates, less than a cup of oil can create a very thin sheen over more than an acre of calm water. Small amounts of oil spilled from numerous boats can accumulate to create a large oil sheen, which blocks oxygen from moving through the surface of the water and can be harmful to animals and larvae that must break the surface to breathe. The hydrocarbons in oil harm juvenile fish, upset fish reproduction, and interfere with the growth and reproduction of bottom dwelling organisms. Oil and gas ingested by one animal can be passed to the next animal in the food chain, ultimately resulting in a risk to human health. In a marina, petroleum spills also dissolve the white Styrofoam in floats and docks and discolor boat hulls, woodwork, and paint. Gasoline spills, which evaporate quickly, are also a safety problem because of the flammability of gasoline.

BMPs that should be considered and used where appropriate:

- *Promote the installation and use of fuel/air separators on air vents or tank stems of inboard fuel tanks to reduce the amount of fuel spilled into surface waters during fueling*

- *Avoid overfilling fuel tanks*

- *Provide doughnuts or small petroleum absorption pads to patrons to use while fueling to catch splashback and the last drops when the nozzle is transferred back from the boat to the fuel dock.*

- *Keep engines properly maintained for efficient fuel consumption, clean exhaust, and fuel economy. Follow the manufacturer's specifications.*

- *Routinely check for engine fuel leaks and use a drip pan under engines.*

- *Avoid pumping any bilge water that is oily or has a sheen. Promote the use of materials that either capture or*

digest oil in bilges. Examine these materials frequently and replace as necessary.

- *Extract used oil from absorption pads if possible, or dispose of it in accordance with petroleum disposal guidelines.*

- *Prohibit the use of detergents and emulsifiers on fuel spills.*

C. Marina Operations Roundtable Discussion