

IMPACT OF FACILITY OPERATIONAL CHARACTERISTICS OF SHORT-TERM RENTALS ON LOADING TO AN OWTS

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Overview

- Defining a short-term rental facility?
- Location, location, location
- Key characterization considerations
- Performance considerations
- System considerations

Define a “short term” rental facility

- How is facility managed?
 - Single family dwelling
 - Hotel equivalent activities – short term stays
- What is the turnover rate?
 - Weekend usage
 - Weekly usage
 - Monthly or greater
 - Seasonal versus year-around



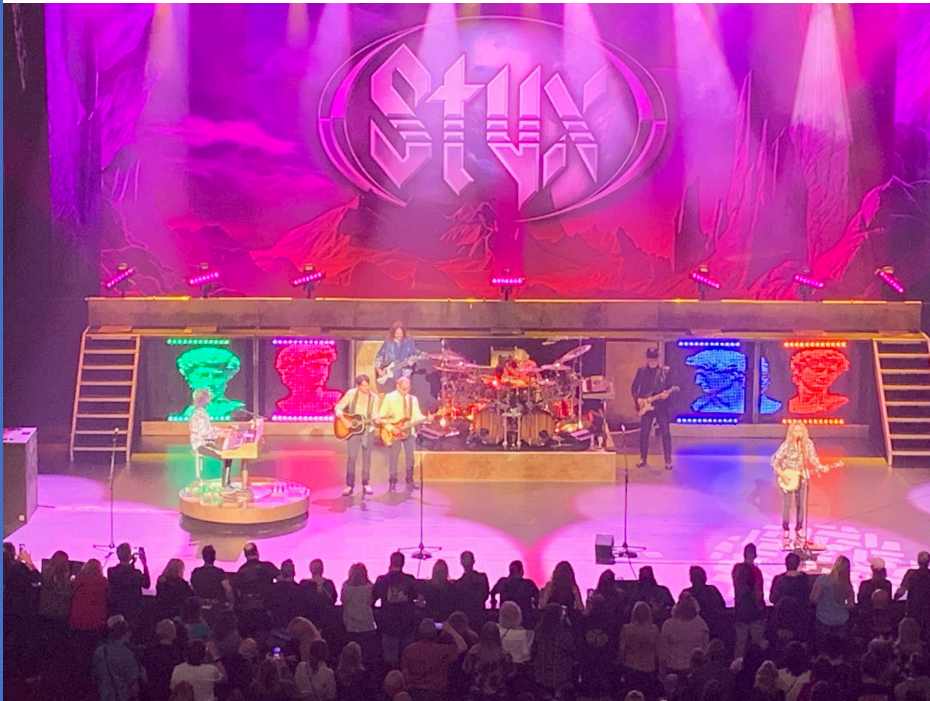
Advertising for sleeping capacity

- Bedrooms – one bed per room
- Dormitory approach
 - Multiple beds
 - Bunk beds
 - Trundle beds
- Living areas
 - Sleeper sofa
 - Murphy bed
- All flat surfaces - Inflatable beds
- Cabins, RVs, tents, hammocks, etc.



What matters in real estate: location, location, location!!!

- Venues
- Outdoor activities
- Destinations



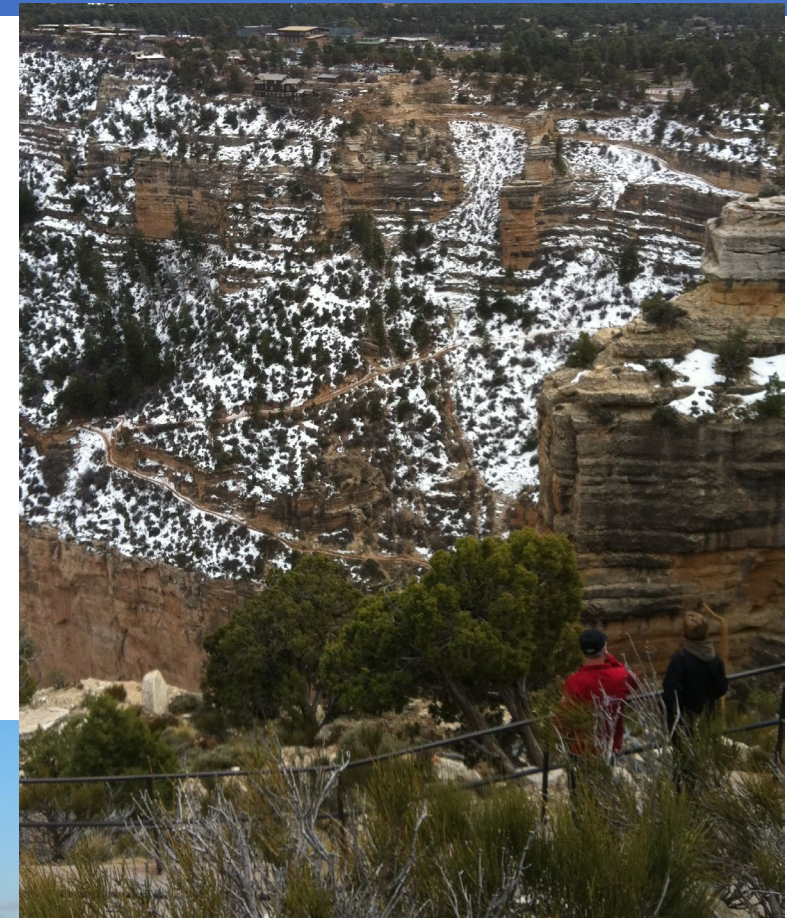
Venues

- Weddings
- Sporting events
- Concerts
- Racing
- Universities



Outdoor activities

- Water attractions: coastal beaches, lakes, rivers
- Outdoor recreational: hiking, snow skiing, snowmobile
- Outdoor sporting: fishing, golfing
- Tourism: State and National parks (Grand Canyon), wine country



Destinations

- Secluded areas
 - Mountain getaways
 - Rustic camping
- Islands



Short term rental - key considerations

- Turn rate
 - Length of stay
 - Seasonal versus year around
- Occupancy
 - Normal
 - All their relatives and close friends
- Time spent at the facility: food and waste generation activities
 - Food preparation at site
 - Restaurants
- Showering and laundry activities
 - Normal activity
 - Double or triple showering and laundry activities
- Cleaning and sanitizing

Airbnb's enhanced cleaning for turnover

Cleaning guidance

- Cleaning is removing dust and dirt from surfaces, such as floors and countertops. Make sure you:
 - Sweep, vacuum, dust, and/or mop areas before sanitizing
 - Wash dishes and laundry on the highest heat setting possible
 - Wipe down hard surfaces with soap and water

Sanitizing guidance

- Sanitizing is when you use chemicals to reduce bacteria on surfaces such as doorknobs and TV remotes. Be sure to:
 - Spray high-touch surfaces in each room with an approved disinfectant spray
 - Let the disinfectant stand for the length of time specified on the product label
 - Allow the surface to air-dry

Cleaning for turnover

- Time is money – clean as fast as possible
- All water using appliances operating at same time
 - Dishwasher
 - Laundry – multiple loads
- Cleaning and disinfecting
 - Sinks
 - Toilets
 - Showers
 - Hard surfaces

Performance considerations

- Hydraulic
- Contaminant mass loading
- Microbial inhibition

Hydraulic impact

- Consistency of loading
 - Year around
 - Weekend venues
 - Seasonal use – extended periods of no use
- Outdoor activities
 - Multiple changes of clothing
 - Double showering and laundry
- Packed house
 - Lots of people –water using activities



Contaminant loading

- People
 - Limited people
 - Lesser organic loading
 - Many people
 - Greater organic loading
 - Greater urine loading



- Food preparation
 - Outdoor grilling
 - Breakfast – bacon grease
 - Garbage disposal
- Cleaning products
 - Greater nitrogen loading
 - 200 to 300 mg/L TN

Microbial inhibition

- Variable or limited food supply
 - Waste imbalance
 - Poo versus urine balance
- Cleaning products
 - Sanitizing
 - Excess nitrogen loading
- Water quality limited
 - Alkalinity

System considerations

- Site specific design
 - Location matters
 - Not one size fits all
 - Low impact area versus high impact site
- Robustness of design
 - Component's inherent ability to handle peaks
 - Safety factors in design values
 - Advanced treatment system
 - Flow equalization a bonus or requirement
- Performance requirements: concentration versus MASS loading basis

OWTS sensitivity to hydraulic loading

- OWTS component: treatment and soil treatment area
- Considerations
 - Component response to peak hydraulic loading
 - Septic tank with effluent screen
 - Trench with storage space
 - Drip field with tubing in soil
 - Design – robust treatment capacity with safety factor
 - Flow equalization / dosing tank with timed dosing

OWTS sensitivity to mass loading

- OWTS component: treatment and soil treatment area
- Considerations
 - Component response to variable mass loading
 - Septic tank – effluent screen
 - Advanced treatment – suspended growth, biofilm growth
 - Trench with storage space
 - Drip field – filtration and tubing in soil
 - Biomass fluctuations and accumulation – food to microorganism ratio
 - Design – robust treatment capacity with safety factor
 - Excess nitrogen loading
 - Flow equalization / dosing tank with timed dosing

Mass Loading Values – per person

Item	Range (lb/cap/day)	Typical without ground up Kitchen waste (lb/cap/day)	Typical with ground up Kitchen waste (lb/cap/day)	Common Value (lb/cap/day)
BOD	0.11 - 0.26	0.18	0.22	0.25
TSS	0.13 - 0.33	0.2	0.25	0.25
NH ³ as N	0.011 - 0.026	0.017	0.019	0.03
Flow (GPD/ Person)	20 - 200			75

Microbial inhibition

- Less toxic alternatives for cleaning and disinfection
- Quaternary ammonium compounds (QACs)
- Deactivation chemicals:
- Commercially available
- Cyclodextrins, lecithin and Tween 80
- Alkalinity

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