



Solid Waste Convenience Center Workshop Key Issues in Site Layout and Operation December 13th and 14th 2011

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Resource Recycling Systems

Waste and Recycling



Biomass Fuel, Organics and Composting



Green Supply Chain - Change Management





RRS Capabilities - Services

**Solid Waste
System
Planning &
Strategy**



**Facilities
Engineering &
Operations
Management**



**Materials &
Residuals
Management**



**Strategic
Planning &
Procurement**





RRS Capabilities – Clients

Municipalities
& Public
Agencies



Universities
& Hospitals



Recycling
Based &
Biomass
Industries



Non-Profits
& Private
Businesses





Focus for Today – the 1 Hour Primer!

- Facility Siting
- Facility Layout
- Containers/Compaction
- Site Design issues





SWCC Facility Siting

Site Size	Site Requirements
Site Criteria	Site Options





SWCC Size Range

Smaller Sites – Less than 1 Acre

- Limited # of Material Types (e.g. MSW, Bulky, a few other materials)
- Limited Capacity for Site Traffic/Daily Counts < 200 visitors
- Servicing Conflicts (heavy trucks mix with small vehicles)

Medium Sized Sites – 1 to 3 Acres

- Expanding List of Material Types – MSW, Bulky – and Focus on Alternatives
- Capacity to handle higher traffic volumes, peak loading (seasonal/weekly)
- Ability to isolate service vehicles from users
- Room to add material, add limited on-site processing capacity

Large Sites 4 Acres and Larger

- Full Range of Material Types – the Regional “Super Drop-off”
- Capacity for high traffic volumes, easily handle peak loading
- Higher levels of user safety, isolation of service vehicles, etc.
- Room for growth, on-site processing opportunities



Siting Considerations

General Location Criteria

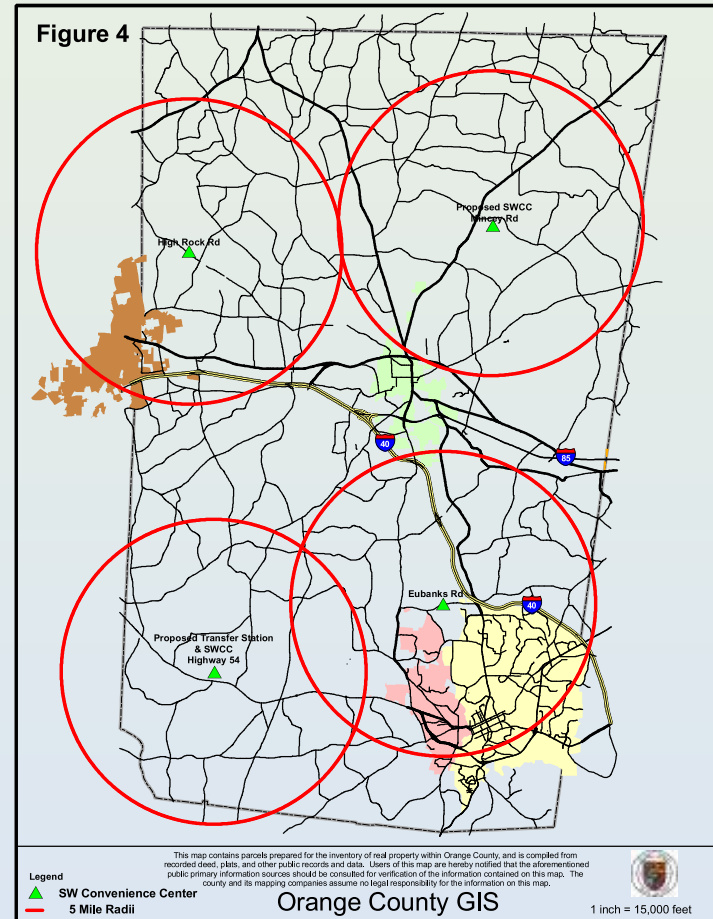
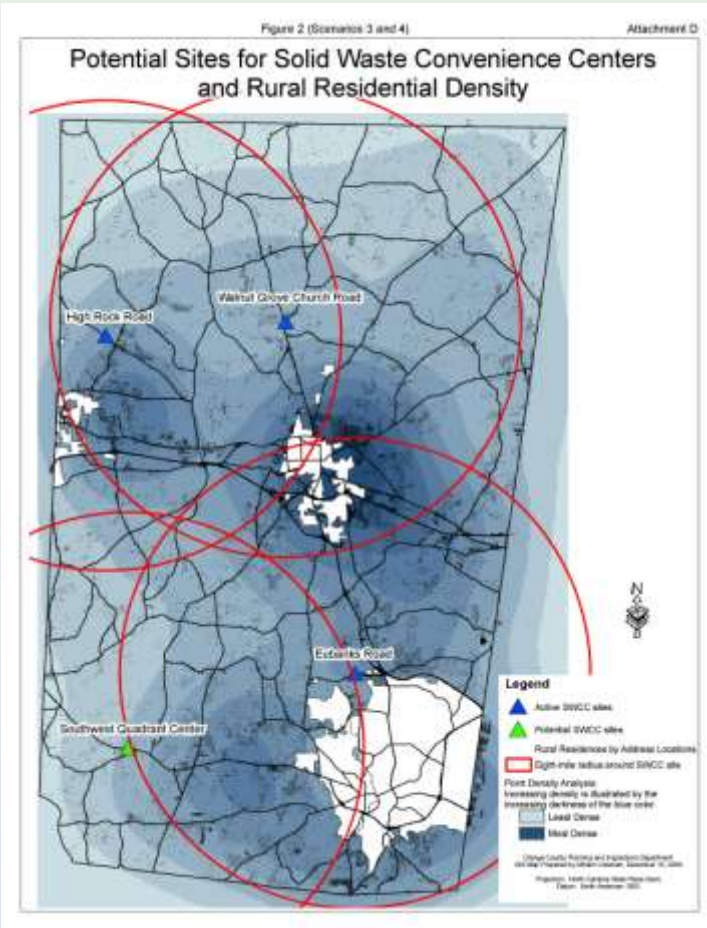
- Near Population Centers - Co-location Opportunities?
- Access to Major Transportation Routes
- Zoning Designation and Zoning Requirements

Site Specific Criteria

- Meets Site Size Requirements
- Space for On-Site Roadways, Queuing, Parking
- Space for Staging Extra Containers
- Service Truck/User Vehicle Compatibility
- Space for all Materials in Collection Plan
- Room for Expansion
- Buffer Zones/Screening
- Gently Sloping Topography (if tiered site)
- Access to Utilities

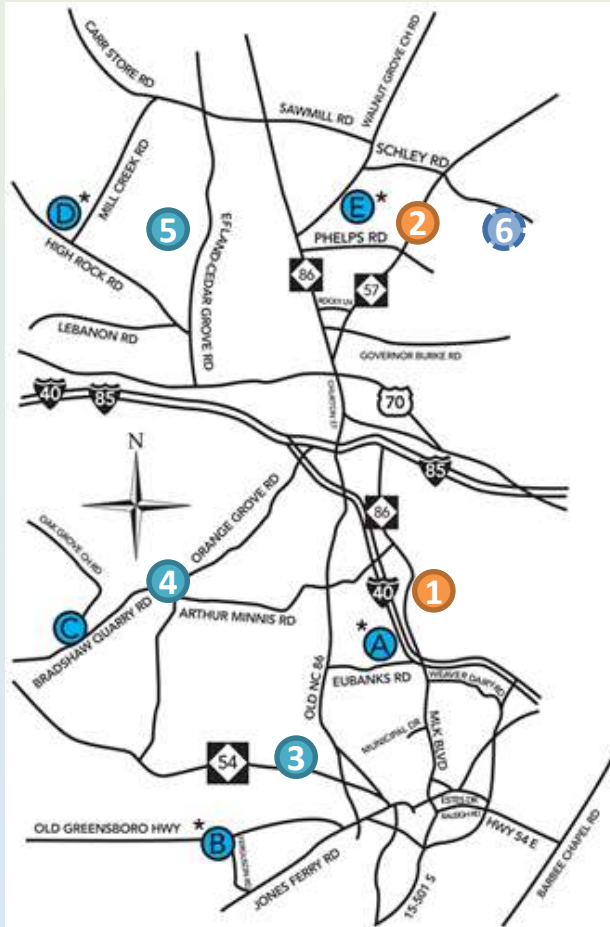


GIS Data Can Drive Location Decisions





Finalizing County-wide SWCC Solution



Larger Regional Centers

1. Eubanks Road
2. Walnut Grove Church Road

Smaller Neighborhood Centers

3. Ferguson Road
4. Bradshaw Quarry Road
5. High Rock Road

Anticipating Future Demand

6. Mincey Road?



Distance to Disposal a Key Factor

CAN DRIVE SHIFT TO ROLL-OFF BASED COLLECTION AND TO COMPACTION



- Fewer hauls – due to compacted material
- Use of less expensive roll-off truck
- These changes are especially critical if disposal options require longer haul distances



Impact of Landfill Closure

- Longer hauls to disposal
- Each haul must carry more waste to cover longer distance
- Cost impact over \$200k/year





Compaction – a Key Site Design Factor

DECIDING TO COMPACT OR NOT

On-site compacting can be beneficial if:

- Material volumes are large
- Material density is low and material can be compressed
- Haul distance is great
- Bulky waste such as furniture is being collected in significant volume

When volumes at any one site are insufficient to fill a large compactor receiver container weekly, servicing a smaller front-load or rear-load container with a compactor truck servicing multiple sites may make more sense.



Variety of Applications in SWCCs





The Business Case for Compaction

GOAL TO REDUCE MATERIAL HANDLING COST

- Savings through hauling compacted material must offset:
 - amortized cost of compaction equipment
 - Plus cost of operating the compaction equipment
- Hauling savings are achieved by hauling more material per trip:
 - fewer trips
 - reduced labor
 - reduced fuel use
 - reduced fleet size
 - reduced wear on fleet
- Selecting the best compaction equipment for the application is important to realizing the projected savings





Example of Operational Savings

Function	Annual Savings
<i>Direct Cost Savings</i>	
- Reduced MSW and Bulky Trips	\$68,000
<i>Labor Cost Savings</i>	
- Reduced MSW/Bulky Collection Labor	\$75,000
- Reduced OCC Collection Labor	\$16,000
<i>Equipment Cost Savings</i>	
- Eliminate 2 Front Load Trucks	\$92,000
- Add 1 Hook Lift Roll-Off	(\$28,000)
Total Annual Savings	\$221,000



Compactor Selection Critical for Results

KEY SPECIFICATIONS MUST BE OPTIMIZED

- Receiving (charge) box size
 - Too small? Users wait for compactor cycling
 - Large receiving hopper critical for bulky items
- Compaction force and pressure
 - High compaction force critical for breaking bulkies
 - High pressure critical for compressible materials
- Cycle time
 - Long cycle time? More user wait time





Matching Compactor to Material

Specification Category	OCC or Single Stream	MSW	BULKY WASTE
Receiving Box	2-3 CY	2-3 CY	4-5.5 CY
Cycle Time	40-60 sec	50-60 sec	60-90 sec
Ram Force	40-50,000 lbs	40-50,000 lbs	80-100,000 lbs
Ram pressure	25-35	25-35	38-50 psi
Cylinder bore	6"	6"	Twin 6" or 7" or 8"
Motor HP	10-15	10-15	20-30



Common Site Issues



- Container loading height
- Lack of paving/dust
- Traffic flow issues
- Odor, vermin, spill control



Best Practice Design Features



Stationary Compactors - for MSW, cardboard, single stream recyclables:

- Reduce labor/collection costs
- Reduce insect/rodent problems
- Control odor
- Save space
- Prevent windblown trash



Best Practice Design Features



Paved Surfaces – asphalt as well as concrete below roll-offs

- Prevents containers from digging into gravel or asphalt
- Prevents ponding
- Eliminates blown dust
- Improves safety and ease of spill clean-up



Best Practice Design Features



Tip Walls/Two-Levels for Large Sites

- Easier loading for users
- Quicker to get users in and out
- Isolates service vehicles





Best Practice Design Features



Multiple lanes allow traffic flow and access to receiving hopper from both sides



Best Practice Design Features



Multiple lanes right at entry help reduce lane stacking going into facility



Goal to Resolve Typical Problem Areas



- More efficient hauling
- Safer & cleaner operation
- Easier loading heights
- More environmental control of runoff and dust
- Improved traffic flow
- Adding popular services



Typical Upgrade Capital Plan

- Compactors



- Vertipaks (small sites)



- Signage



- Balers for specialty items

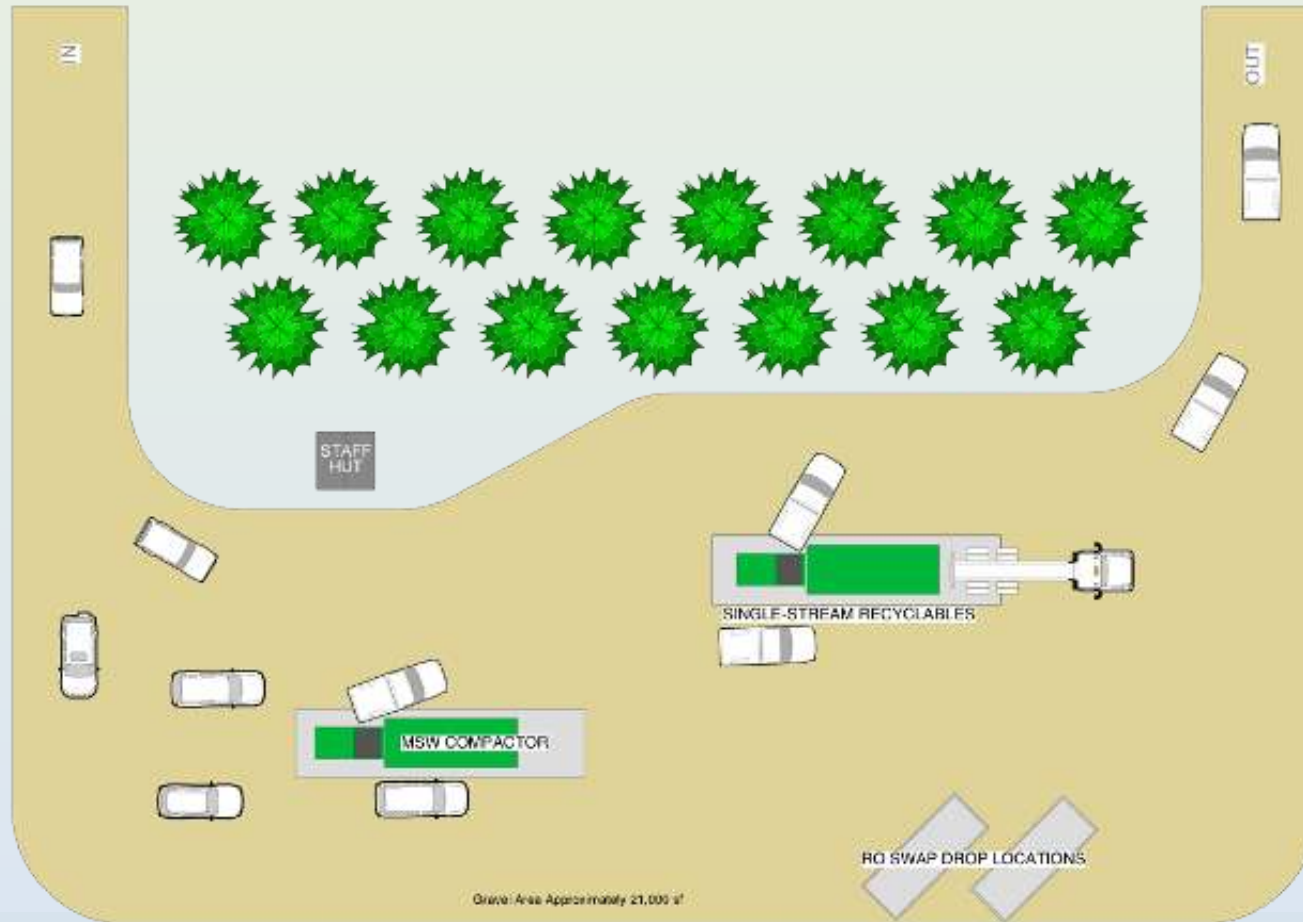


- Paving



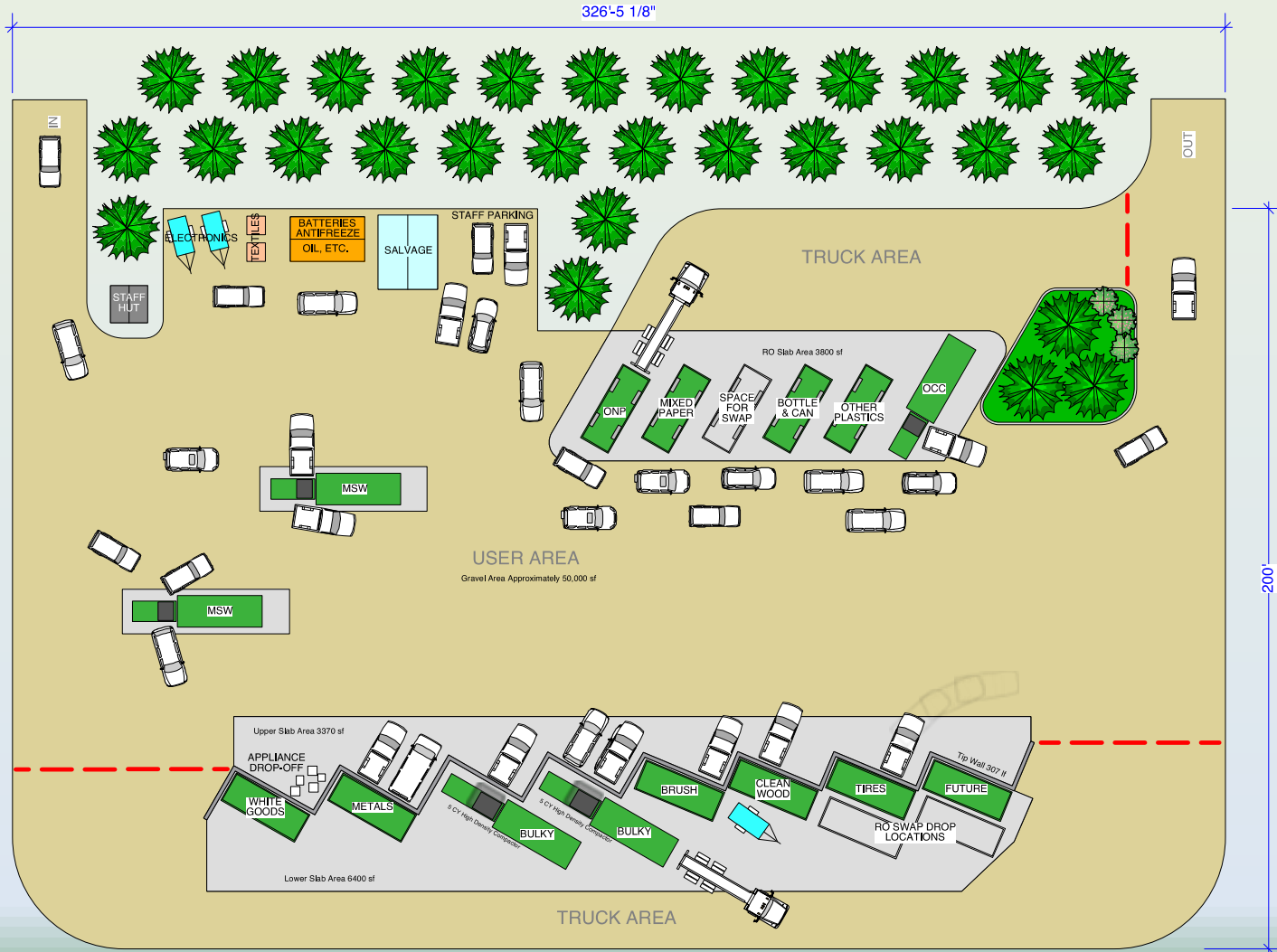


Sample Small Neighborhood Site Layout



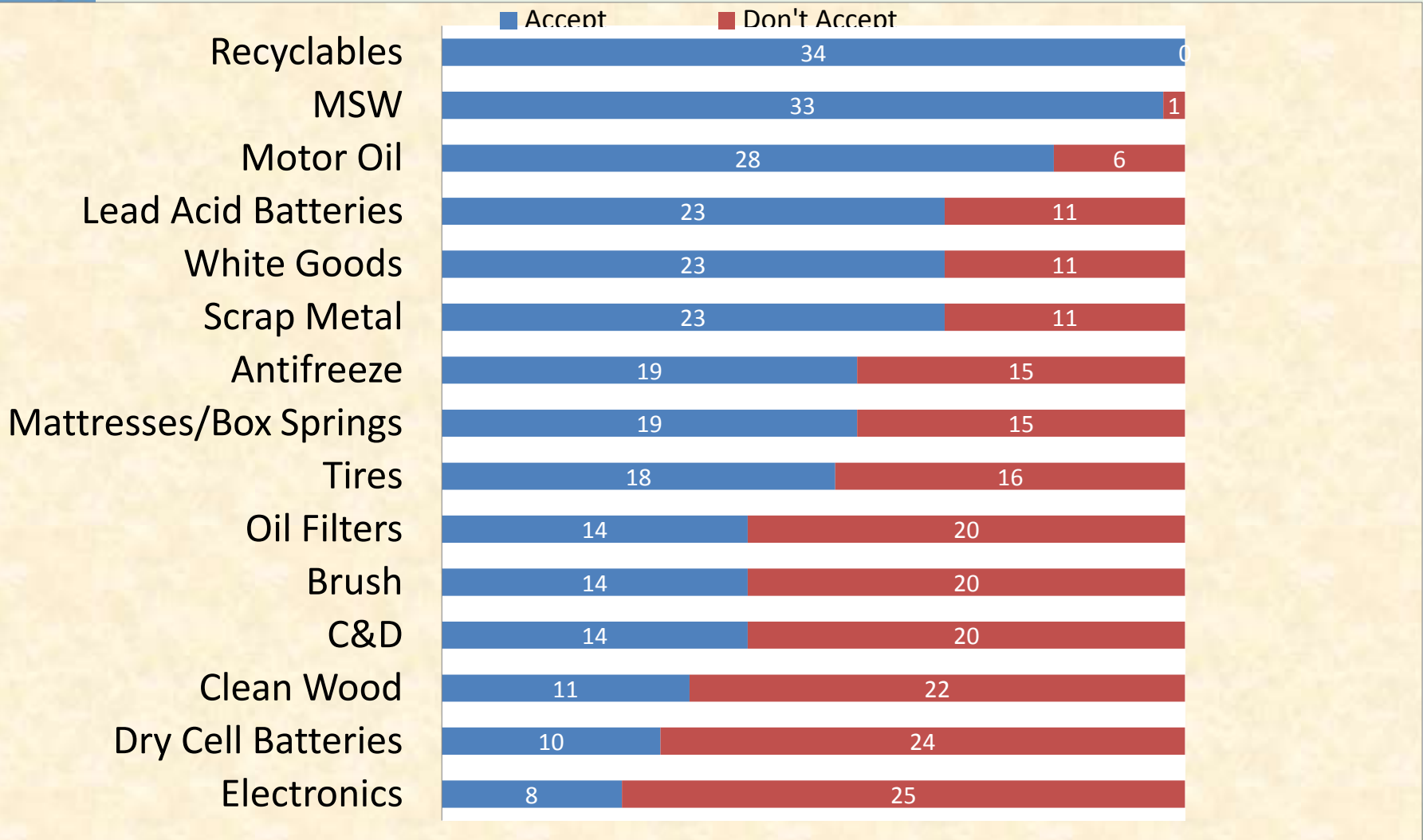


Sample Larger Sized Site Layout





SWCC Survey – Materials Accepted





Exploring Your SWCC System Potential

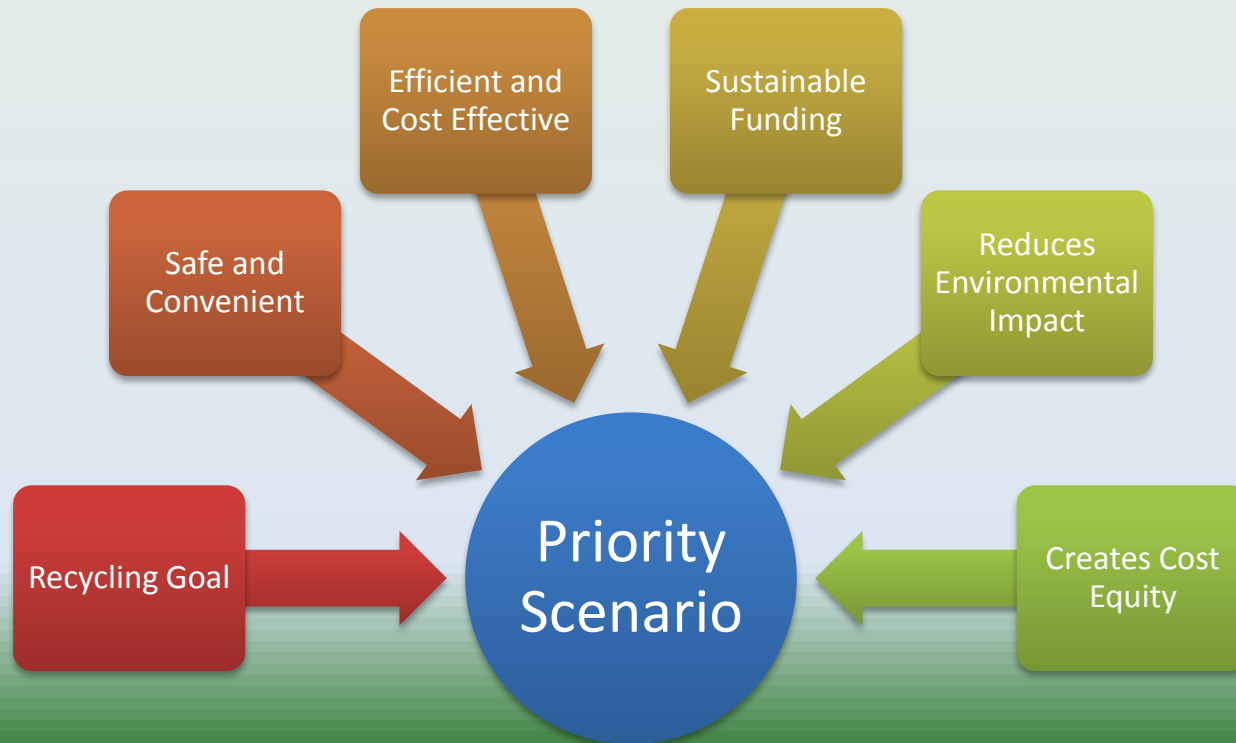
KEY OPPORTUNITIES

- Optimize Cost of Service
- Optimize Number of Sites in System
- Develop On-Site Processing Capacity
- Build Fee Based Revenue Potential
- Increase Volumes of Targeted Material
- Reduce Dual and Triple Handling
- Add Specialty Materials



How to Evaluate/Narrow Down Options

- Develop Technical Range of Options as Scenarios
- Evaluate Costs and Public Preferences
- Rate Options Against Weighted Decision Criteria
- Final Ranking and Recommendation





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QUESTIONS?

Providing Sustainability Solutions Since 1986

For the past 25 years Resource Recycling Systems has been directly engaged in driving environmental innovation and leadership by growing sustainable resource management infrastructure.

