



From Deciding what to Build to Lessons Learned:
A Mixed Waste Processing case study in Utah

SWANA Region 6 Conference
August 25, 2021




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About
GBB & Wasatch

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SOLID WASTE
MANAGEMENT
CONSULTANTS

We believe in a world where discarded materials are used as resources rather than wasted.

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About Wasatch

www.WIWMD.org

WASATCH
INTEGRATED
waste management district

- Waste management services to Davis and Morgan Counties and 15 member communities – managing 340,000 total TPY
- Owns/operates a local landfill (limited capacity) w/ drop-off and LFG-to-Energy system
- Green waste recycling and composting (yard debris) – 25,000 TPY
- Re-use store and HHW drop-off
- Owns an alternate landfill (80+ miles away)
- 420 TPD WTE plant (steam supply to Hill Air Force Base) closed May 2017 after 30 Years operation

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The GBB logo, consisting of the letters 'G', 'B', and 'B' in a bold, maroon, sans-serif font with a white outline, set against a grey background.

About Wasatch

www.WIWMD.org

WASATCH
INTEGRATED
waste management district

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Landfill Residential Drop-Off



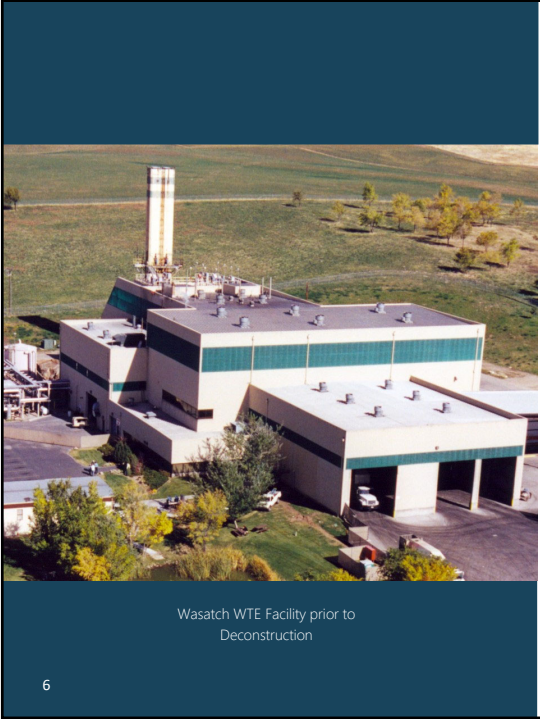
Composting Operation



Landfill Thrift Store



Admin Building



Wasatch's Changing Paradigm

- WTE System Operations
 - WTE plant started operations in 1987, mostly to supply steam to Hill AFB
 - System was due for major upgrades and refurbishments
 - March 2017 Board elects to close plant due to anticipated loss of steam contract and other costs
 - Increased tonnage to local landfill greatly shortening lifespan
- Wasatch Needs and Goals (SWMP)
 - Reduce Waste to Local Landfill (preserve life for local drop-off)
 - Maintain Control of Waste Management and Limit Cost Increases to Customers
 - Increase Regional Material Diversion through Recycling = Reducing Landfilling in General






Feasibility Analysis

A look at the possibilities

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Three Options Considered

| | | |
|--|---|---|
|  Transfer Station Only |  Transfer Station with MWP/MMP to produce recyclable commodities |  Transfer Station with MWP/MMP to recover recyclable commodities and Cement Kiln Fuel |
|--|---|---|

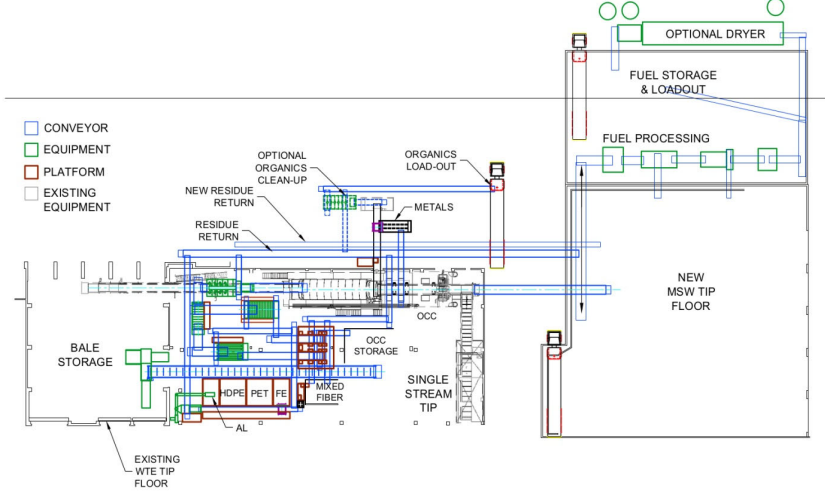
With Two Sub-Options

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Feasibility Analysis

Preliminary Layouts for Feasibility Estimates

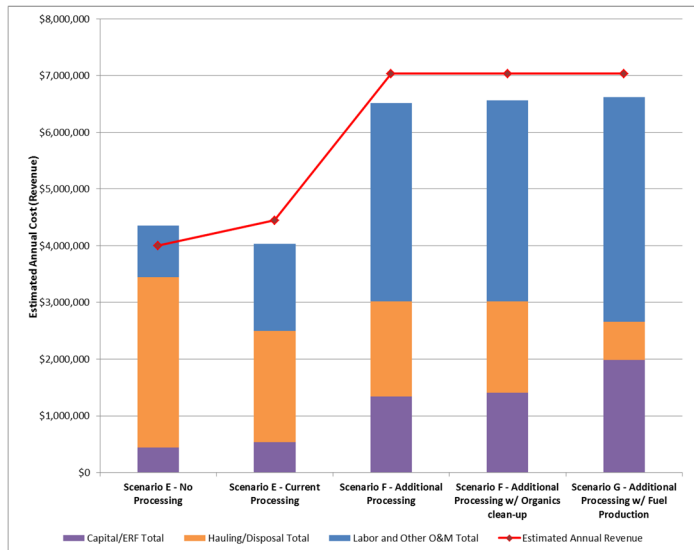


Transfer Station with MWP and Fuel Production



Feasibility Analysis

Costing Scenarios



Feasibility Analysis

Financing a New Facility

- Board Approval of Bonding
- Financing Options
 - Reserve Funds in part
 - New – long-term debt
 - Revenue Bonds (tax-exempt bonding status?)
 - Asset-secured financing
 - Private Partnerships – Offtakers purchase support for the equipment.
- Select Financial Advisor, Investment Banker and Bond Counsel (to place debt requirements)
- Present to Bond Rating Agency
 - Tell a compelling story
 - Firm Revenue Streams



Procurement Process

The RFP

Procurement Process

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The RFP Process

- RFP approach: Conventional (contracted separate), Design/Build, Design/Build/Operate
- Compiling the RFP Team and deciding on criteria
- Design/Build needs for the RFP (BOD)
 - Approximate Budget
 - Building if known, (limits if not known)
 - Outputs desired and location of outputs, if known
 - Detailed Composition of material to be processed
 - System Guarantees
 - System Reporting Needs
 - Building and Employee Heating/Cooling plans
 - Responsibilities
- Encourage system versatility/flexibility
- Distribution and time for adequate answers
- Scoring responses/Interviews/Finalizing first choice

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Procurement Process

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Proposal Design to Final Contract Design

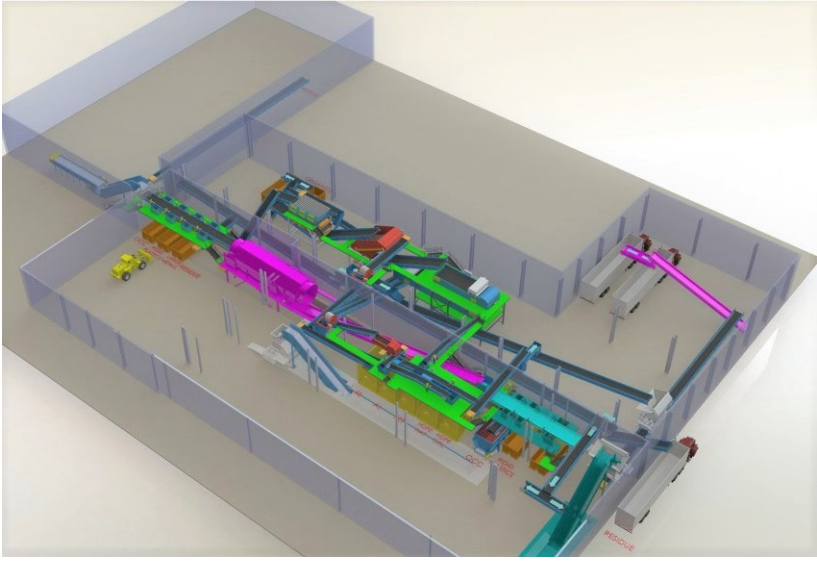
- Getting a second opinion on Proposed Design. Does the Proposal:
 - Fulfill the needs of processing and recovering materials?
 - Create the appropriate outputs?
 - Have design issues/bottlenecks that need to be addressed?
 - Identify potential hazards/confined spaces?
 - Have adequate maintenance access?
- Reuse of Existing Equipment/Buildings/Pits
- Finalizing testing protocol for system performance
- Finalizing Equipment/Building Ft²/Pricing
- Final Contract design is still conceptual but should allow for beginning of next steps

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Procurement
Process

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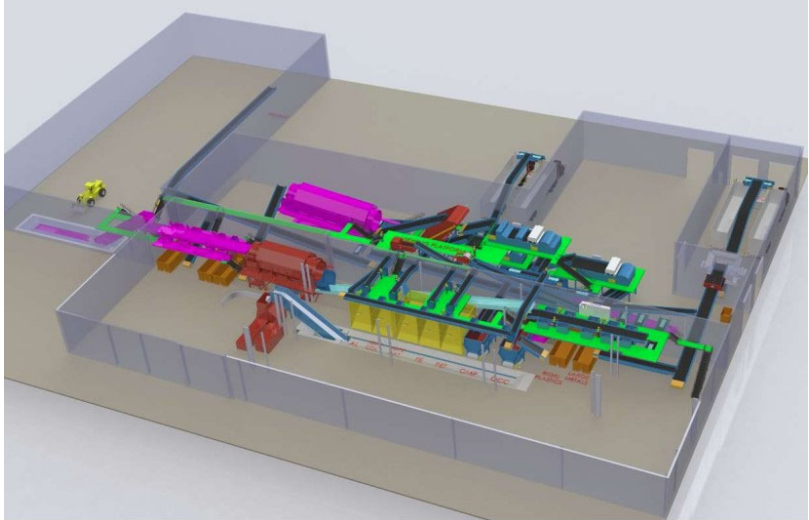
Chosen Proposal Design



Procurement
Process

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Final Contract Design



Procurement Process

Signed Contract

- Other possible negotiation points-
 - Payment Schedules
 - Performance Guarantees, Warranties, and Testing Protocol
 - Spare Parts Inventory Supplied with System
 - Break-in/Startup Support Period
 - Construction Sequencing
 - Timing due to production capabilities, weather, etc..
 - Performance Schedule
 - Liquidated Damages
 - Insurance

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Design & Construction

*From
Signed Contract
to Start-up*

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Design &
Construction

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Contract Design to Final Design to Engineered Design

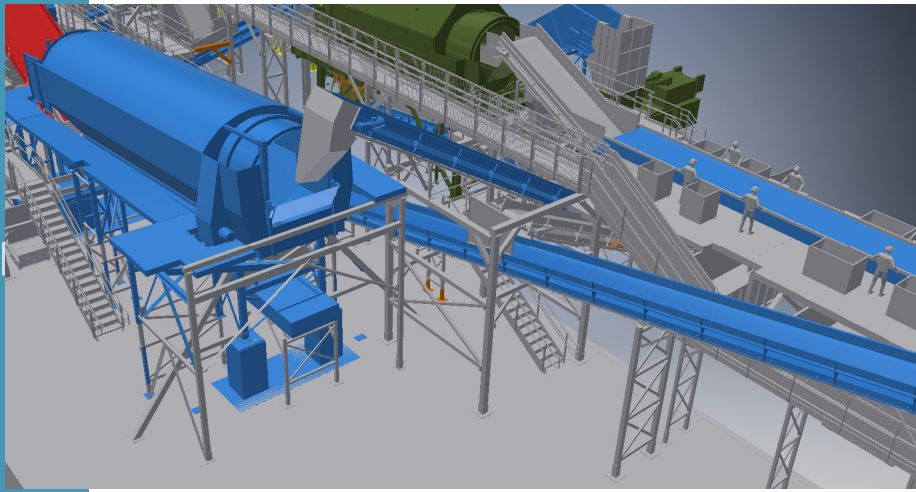
- Allow adequate time to create the final conceptual design that will be basis of engineered design
- Include necessary details not present in proposal design such as:
 - Final equipment locations
 - Access and Egress locations (stairs, etc.)
 - Offices and Worker accommodations
 - Building Doors and equipment pass-through locations
 - Vehicle and maintenance access lanes
 - Pits and other floor modifications
 - Building columns and footer locations
 - Sprinkler Riser room location/Electrical locations
 - Compressor Location(s)
- Coordinating Equipment Vendor and Building Designer



Design &
Construction

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Engineering Design



Engineered Design with Supports



Design & Construction

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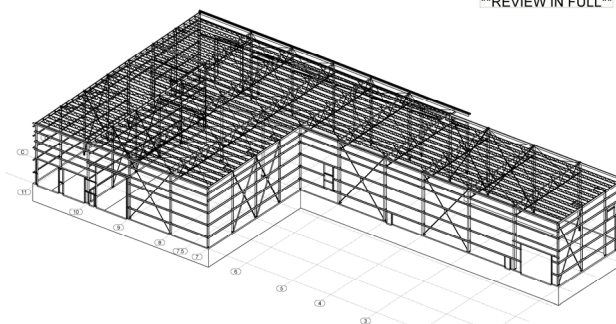
Final Permitting

- Prior to RFP
 - Prior Operating Permits (Solid Waste, Leachate, Stormwater, Air, etc....) for existing system
- Prior to Contract/Construction
 - Building and Construction Permits
- Prior to Start-Up
 - Fire and Occupancy Permits (including Temporary)

WASATCH MIXED WASTE PROCESSING FACILITY

3404 NORTH 650 EAST
LAYTON, UTAH 84041

PERMIT SET
REVIEW IN FULL



Other Considerations (usually by Owner)

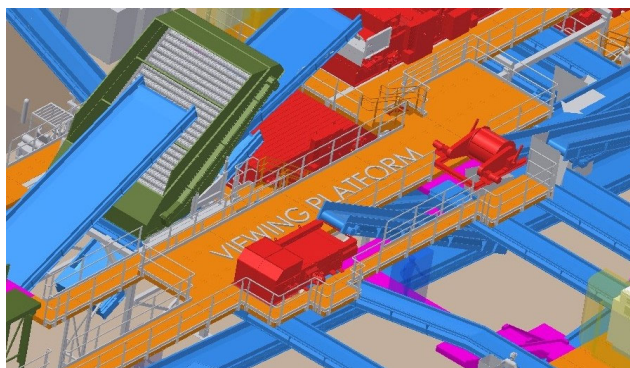
- Infrastructure (Electric, Water, Sewer, Other)
- Traffic, Scales, Fire Suppression (Sprinklers, Deluge, Fire Rover)
- Noise, Trash, Education Access
- Machine Vision
- Maintenance needs
 - Electric or Air outlets on equipment for cleaning
 - Hoists and Gantries for heavy shafts/motors etc..
 - Lift points for heavy equipment access



Sprinkler Riser Room

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Educational
Viewing
Platform



Design & Construction

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Material and Offtake Agreements

- (Incoming Material & Markets for commodities or off-takers of products)
- Rework incoming material contracts as necessary
 - Warn of logistics changes, if necessary, during construction
- Identify and acquire offtake agreements
 - Residue
 - Fines/Organics
 - Recyclable Commodities
 - Fuel (a proportion and mix of recyclable commodities and non- recoverable recyclables)
- Backup Agreements for Transfer and Disposal

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Design & Construction


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Equipment Installation


- Necessary Infrastructure (Electrical, Footings, Ventilation, Etc.)
- Room for Staging
- Identifying Critical Installs (Blocking other work/installs)
- Inadvertent Confined Spaces



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Back Side of New Buildings



New OCC Collection Conveyor


Change Orders

Total of 39 Change Orders – 5.5% of Original Contract

Examples include:

- Snow Drift Modifications
- Fire Suppression Additions
- Additional Site Grading and Soft Spot Repair
- Added Asphalt and Changes in Concrete Needs
- Additional OCC Transfer Conveyor
- Additional Downspout Drainage

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Start-Up and System Testing

Team Training, Punch Lists and Final Testing and Commissioning


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System Startup & Testing

Training and System Review

- Team training
- Requires input from operator and vendor with an emphasis on the following:
 - Safety
 - Maintenance
 - Operations
 - System Variables

Pre-Sort Team Members



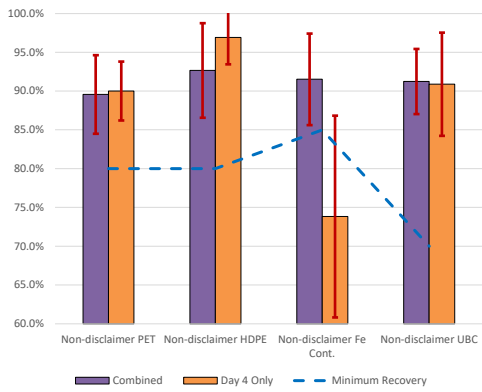
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Testing

Final System Testing


- Robust testing with statistical analysis (Over 4 Days)
- Recommend third party testing (not Vendor)
- Coordination between vendor and operator needed for smooth tests
- Will interrupt normal processing at times so logistics with haulers may be needed

MSW Testing Results - Recovery



| Material Category | Combined Recovery (%) | Day 4 Only Recovery (%) | Minimum Recovery (%) |
|-------------------------|-----------------------|-------------------------|----------------------|
| Non-disclaimer PET | ~90.0 | ~90.0 | 80.0 |
| Non-disclaimer HDPE | ~93.0 | ~96.0 | 80.0 |
| Non-disclaimer Fe Cont. | ~92.0 | ~74.0 | 85.0 |
| Non-disclaimer UBC | ~92.0 | ~91.0 | 74.0 |

Test Sample Sorting Area



Public Education & Preliminary Results

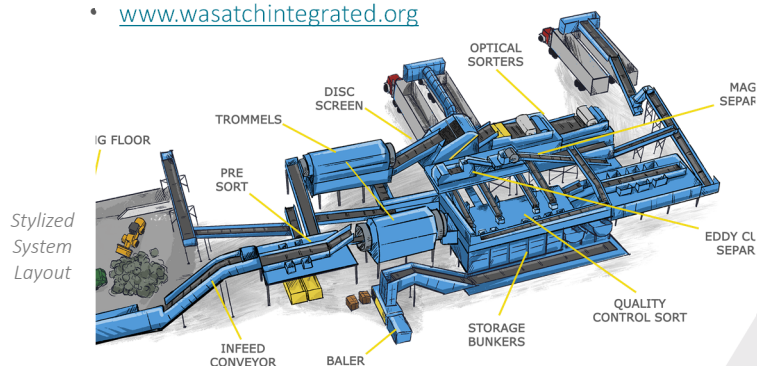
*Involving the
Community*

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Public Education

Outreach, even during the COVID-19 pandemic:

- New Website, Saltworksdigital.com
- Web videos posted to website (Construction, operations, etc.)
- Robust and accessible education materials available on website
Which focus on the why and how
- Recycling/Diversion counters
- Tours / Virtual Tours to Students / Education Center
- Press releases announced on Website
- www.wasatchintegrated.org



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Preliminary Results:

- Transfer Operations Working Well
 - Transferring up to 700 tpd
- Processing Equipment Performing Well
 - Currently running about 85 to 90% availability
- Producing high quality recyclables moving to market
 - 3.5% diversion
- Producing well accepted feedstock for cement plant
 - 7.5% diversion
- Still working on organics offtake
 - Potential for 20% to 40% diversion



Next Steps

Into the Future:

- Mattress Processing
- RDF Densification
- Organics/Fines Outlets
- Potential source for alternative conversion experimentation with Universities or other entities

Fines and Organics Outfeed



Open Q&A

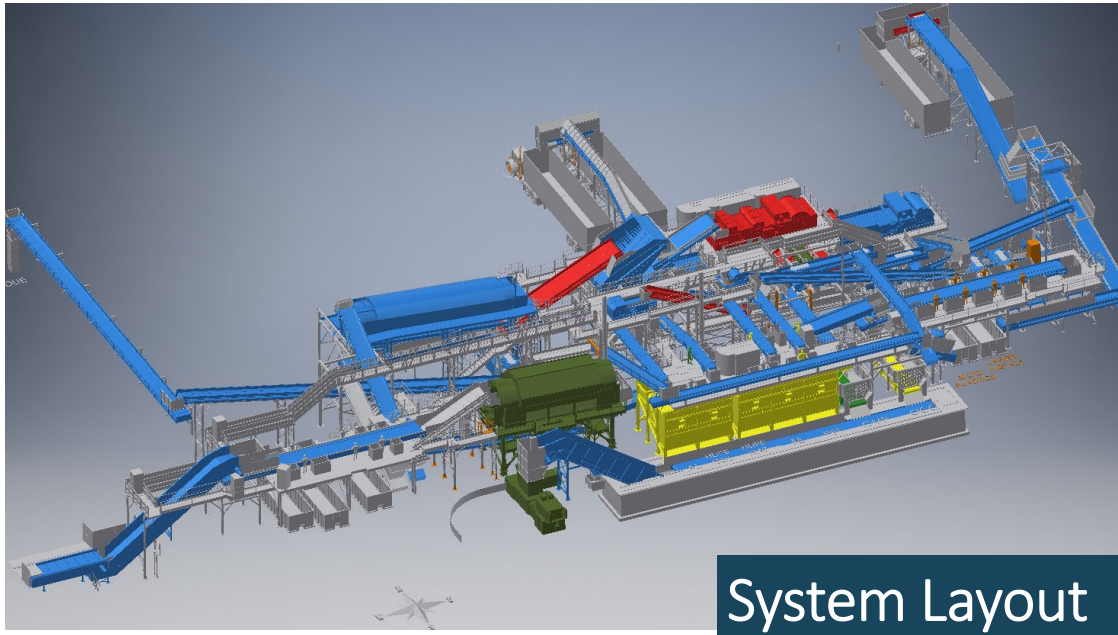


Brad Kelley

Direct 703 663 2097

Email bkelly@gbvinc.com

*Time for your
Questions*



System Layout