APPENDIX A

Component Comparison Matrix

A.1 Summary

Some of the components in Section 4.3 Components have multiple versions that require additional evaluation. A toilet, for example, has a basic shape with slight aesthetic variances that typically have no effect on function (although cleaning can take longer with additional bumps and crevices) but there are two primary methods of flushing that have pros and cons. Likewise, the flush valve has several variations. There are manual and automatic flush valves as well as the option of concealed or exposed. These alternatives all impact cost, both initial and long-term, maintenance, sustainability, etc.

The matrix in this appendix lists those products and materials that require additional research and discussion among the Restroom Team. They include:

- Surfaces
- Accessories
- Plumbing
- Electrical

Each listing has several columns of information to consider that include:

- **Initial Cost**: Approximate cost of installation. Measured as Low, Mid, and High relative to the range of costs within that product industry.
- **Lifecycle Cost**: Approximate cost of maintaining the product over its life. Measured as Low, Mid, and High relative to the range of costs within that product industry.
- **Warranty**: Typical warranty period for product in years.
- **Maintenance:** Types of maintenance and potential issues for cleaning or repair.
- **Sustainability**: Aspects that stand out relative to green initiatives.
- **Pros**: Positive aspects.
- **Negative**: Potential issues.

A note about warranties: The standard warranty for construction installation is one year. During this year, it is the contractor's responsibility to have warranty work corrected. Beyond this time frame, it would be the airport's responsibility. Many manufacturers have much longer warranties, even for the lifetime of the product, although there are typically limitations. The warranties for some components in the matric on the following pages vary dramatically from one manufacturer to another.

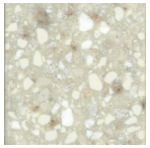
The warranties stated in these pages are "typical" but not universal. It is imperative that the Restroom Team obtain specific information about warranties and their limitations on each product prior to making final product selections.

PRODUCT	INITIAL COST	LIFE CYCLE COST	WARRANTY	INITIAL COST: High, Mid, or Low based on full range of costs for similar materials. LIFE CYCLE COST: High, Mid, or Low based on full range of costs for similar materials. WARRANTY: Number of years. MAINTENANCE	SUSTAINABILITY	PROS	CONS
SURFACES							
Floor							
PORCELAIN TILE 	Mid	Mid	Vary	Hot/warm water. For stains and soling, use a neutral Ph cleaner. No sealers are needed. Multiple rinses may be necessary until water is clear.	Many porcelain tiles incorporate 10 - 40% recycled content and contribute to LEED.	Large format tile minimize grout joints and a thin 1/16" grout joint can be achieved with rectified porcelain, minimizing mold and mildew build up. Fewer grout joints is a quieter surface. Color through body of porcelain disguises chipping.	Large format tile is more difficult to install, however, costs are on the decline as installers obtain more experience. Floor flatness is required. Floor inspection and necessary prep is needed to ensure flush installation with no lippage.
THIN PORCELAIN STONEWARE SLAB 	Mid	Mid	Vary	Hot/warm water. For stains and soling, use a neutral Ph. cleaner. No sealers are needed. Multiple rinses may be necessary until water is clear.	Many porcelain tile incorporate 10 - 40% recycled content and contribute to LEED.	Large format tile minimize grout joints and a thin 1/16" grout joint can be achieved with rectified porcelain, minimizing mold and mildew build up. Fewer grout joints provides a quieter surface. Color through body porcelain disguises chipping. Thin porcelain can be installed over existing floors, minimizing demolition costs.	Large format tile is more difficult to install, however, costs are on the decline as installers obtain more experience. Floor flatness is required. Floor inspection and necessary prep is needed to ensure flush installation with no lippage.
EPOXY TERRAZZO 	High	Low	Up to 15	Maintenance programs geared for 1st and 2nd shift daily cleaning, 3rd shift nightly cleaning, weekly cleaning, monthly hose-down cleaning and quarterly or bi-annual cleaning procedures.	LEED supportive, no VOC's, pre and post- consumer recycled aggregate, North America marble aggregate, recycled porcelain, glass and mirror aggregate. Most regions in North America can source aggregates within a 500 mile radius.	Lasts the life of the building, upscale visual appearance, seamless - no grout joints, anti-microbial, quiet surface, high recycled content.	Higher upfront cost but supports return on investment with its life cycle.

PRODUCT	INITIAL COST	LIFE CYCLE COST	WARRANTY	INITIAL COST: High, Mid, or Low based on full range of costs for similar materials. LIFE CYCLE COST: High, Mid, or Low based on full range of costs for similar materials. WARRANTY: Number of years.			
				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Wall and Base							
PORCELAIN TILE 	Mid	Mid	Vary	Hot/warm water. For stains and soling, use a neutral Ph cleaner. No sealers are needed. Multiple rinses may be necessary until water is clear.	Many porcelain tile incorporate 10 - 40% recycled content and contribute to LEED.	Large format tile minimize grout joints and a thin 1/16" grout joint can be achieved with rectified porcelain, minimizing mold and mildew build up. Fewer grout joints. Color through body porcelain disguises chipping.	Large format tile is more difficult to install, however, costs are on the decline as installers obtain more experience. Floor flatness is required. Floor inspection and necessary prep is needed to ensure flush installation with no lippage.
THIN PORCELAIN STONEWARE PANEL 	Mid	Mid	Vary	Hot/warm water. For stains and soling, use a neutral Ph cleaner. No sealers are needed. Multiple rinses may be necessary until water is clear.	Many porcelain tile incorporate 10 - 40% recycled content and contribute to LEED.	Large format tile minimize grout joints and a thin 1/16" grout joint can be achieved with rectified porcelain, minimizing mold and mildew build up. Fewer grout joints. Color through body porcelain disguises chipping. Thin porcelain can be installed over existing walls, minimizing demolition costs.	Large format tile is more difficult to install, however, costs are on the decline as installers obtain more experience. Floor flatness is required. Floor inspection and necessary prep is needed to ensure flush installation with no lippage.
QUARTZ	High	Low	15	Low quartz maintenance, mild soap solution and wiped dry. Avoid harsh chemicals. Good performance in hose-down environment.	LEED supportive, no VOC's, pre and post- consumer recycled aggregate, North America marble aggregate, recycled porcelain, glass and mirror aggregate. Most regions in North America can source aggregates within a 500 mile radius.	Large format floor to ceiling wall panels available, large range of colors, upscale visual appearance, durable, resistant to scratches, stains and impact, antimicrobial and no sealers required.	Higher upfront cost but supports return on investment with its life cycle.

PRODUCT	INITIAL COST	LIFE CYCLE COST	WARRANTY	INITIAL COST: High, Mid, or Low based on full range of costs for similar materials. LIFE CYCLE COST: High, Mid, or Low based on full range of costs for similar materials. WARRANTY: Number of years. MAINTENANCE	SUSTAINABILITY	PROS	CONS
Wall and Base							
EPOXY TERRAZZO COVE BASE 	High	Low	Up to 15	Maintenance programs geared for 1st and 2nd shift daily cleaning, 3rd shift nightly cleaning, weekly cleaning, monthly hose-down cleaning and quarterly or bi-annual cleaning procedures.	LEED supportive, no VOC's, pre and post- consumer recycled aggregate, North America marble aggregate, recycled porcelain, glass and mirror aggregate. Most regions in North America can source aggregates within a 500 mile radius.	Lasts the life of the building, upscale visual appearance, seamless - no grout joints, anti-microbial, quiet surface, high recycled content.	Higher upfront cost but supports return on investment with its life cycle.
Ceiling							
GYPSUM BOARD 	Mid	Low	1	Cleaning dust off surfaces. Periodic repainting. Repairing damaged corners of surfaces.	GREENGUARD Certified, excellent recycled content	Seamless surfaces. Easy to construct changes in levels and articulated soffits. Can be any color. Flexible installation ceiling devices.	Little acoustical value. Access to plenum requires unsightly access panels.
ACOUSTIC CEILING PANELS 	Low	Low	1 to 30	Panels vulnerable to damage. Not suitable for wet locations (powerwashed restrooms) unless vinyl coated, which looks institutional. Minimal cleaning.	Sustainable products available.	Variety of textures, colors, and grids. Three-dimensional shapes available. Great acoustic properties. Larger panels available for less gridded aesthetic. Easy access to plenum above.	Less flexible for ceiling device layout. Can look dated. Some textures appear dirty from low light levels.
ACOUSTIC METAL PANELS 	High	Low	1	Panels more durable. Available for wet locations (powerwashed restrooms). Minimal cleaning.	Recycled materials, low-emission materials.	Variety of patterns, colors, and grid systems. Three-dimensional shapes available. Great acoustic properties. Larger panels available for less gridded aesthetic. Easy access to plenum above. Some come with integrated lighting.	Less flexible for ceiling device layout.

PRODUCT	INITIAL COST	LIFE CYCLE COST	WARRANTY	INITIAL COST: High, Mid, or Low based on full range of costs for similar materials. LIFE CYCLE COST: High, Mid, or Low based on full range of costs for similar materials. WARRANTY: Number of years.			
				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Stall Partition / Urinal Screen							
POWDER COATED STEEL	Low	High	Up to 15	Mild soap solution and wiped dry.	GREENGUARD Certified, excellent recycled content.	100% fire proof, easy to install, wide range of colors, repairable materials.	Powder coated steel scratches, dents and rusts. Not graffiti resistant. Low to moderate visual appearance and institutional quality. Low performance in hose-down environment.
SOLID PLASTIC (HDPE) HIGH DENSITY POLYETHYLENE	High	Mid	15 to 25	Mild soap solution and wiped dry. Avoid abrasive cleaners and brushes. Consult manufacturer for more stubborn stains recommendations.	GREENGUARD Certified, excellent recycled content, resists bacteria, no mold growth.	100% fire proof, easy to install, wide range of colors and textures, highly resistant to stains and most scratches, cleaning agents, moisture, corrosion, dents and chips. Cuts and scratches can be repaired - consult manufacturer.	Moderate visual appearance and institutional quality. Textured finishes attract dirt and particles. Good performance in hose-down environment.
PHENOLIC - BLACK CORE and COLOR THRU	High	Mid	3 to 15	Mild soap solution and wiped dry. Good performance in hose-down environment.	GREENGUARD Certified, excellent recycled content.	100% fire proof, easy to install, wide range of colors, resistant to most stains, cleaning agents, moisture, corrosion, graffiti, dents and chips. Color thru core disguises scratches.	Low to moderate visual appearance and institutional quality. Black core does not disguise scratches.

PRODUCT	INITIAL COST	LIFE CYCLE COST	WARRANTY	INITIAL COST: High, Mid, or Low based on full range of costs for similar materials. LIFE CYCLE COST: High, Mid, or Low based on full range of costs for similar materials. WARRANTY: Number of years. MAINTENANCE	SUSTAINABILITY	PROS	CONS
Stall Partition / Urinal Screen							
SOLID SURFACE 	High	Mid	10	Mild soap solution and wiped dry. Consult manufacturer for more stubborn stains recommendations. Good performance in hose-down environment.	LEED supportive low-emitting material and recycled content.	Class A fire rated, won't delaminate, durable, resistant to corrosion, graffiti, impact, mildew, moisture. Scratches can be buffed out. Matte finish is standard, least maintenance. Wide range of colors, upscale visual appearance.	More difficult to install. Scratches and stains may occur but can be buffed.
RECYCLED PAPER - RESIN CORE 	Low	High	10	Soapy warm water applied and removed with a soft cloth or sponge. If necessary for sanitary reasons, a 10% bleach solution can be applied.	LEED supportive paper composite from FCS certified 100% post-consumer recycled paper and/or 100% post-consumer recycled cardboard. Contains no added urea formaldehyde resins.	Class A fire rated, won't delaminate, durable, resistant to corrosion, graffiti, impact, mildew, moisture and bacteria. Good performance in hose-down environment.A49	More difficult to install. Moderate selection of colors. Scratches and stains may occur but can be buffed.
STAINLESS STEEL - #4 FINISH 	Mid	High	15	Non-chlorinated spray cleaner/degreaser and a microfiber cloth. Don't use harsh abrasives, acids or chlorine-based cleaners or cleaning tools. Heavier soiling can be removed using a paste of baking soda on a damp sponge or light duty cleaning pad.	LEED supportive, excellent recycled content.	100% fire proof, vandal resistant, durable material, corrosion resistant, upscale appearance. Good performance in hose-down environment.	#4 brushed finish fingerprints and scratches but can be buffed to minimize scratch. Moderate to higher end visual appearance.

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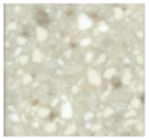
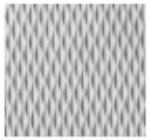
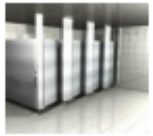
Stall Partition / Urinal Screen							
SOLID SURFACE 	High	Mid	10	Mild soap solution and wiped dry. Consult manufacturer for more stubborn stains recommendations. Good performance in hose-down environment.	LEED supportive low-emitting material and recycled content.	Class A fire rated, won't delaminate, durable, resistant to corrosion, graffiti, impact, mildew, moisture. Scratches can be buffed out. Matte finish is standard, least maintenance. Wide range of colors, upscale visual appearance.	More difficult to install. Scratches and stains may occur but can be buffed.
RECYCLED PAPER - RESIN CORE 	Low	High	10	Soapy warm water applied and removed with a soft cloth or sponge. If necessary for sanitary reasons, a 10% bleach solution can be applied.	LEED supportive paper composite from FCS certified 100% post-consumer recycled paper and/or 100% post-consumer recycled cardboard. Contains no added urea formaldehyde resins.	Class A fire rated, won't delaminate, durable, resistant to corrosion, graffiti, impact, mildew, moisture and bacteria. Good performance in hose-down environment.A49	More difficult to install. Moderate selection of colors. Scratches and stains may occur but can be buffed.
STAINLESS STEEL - #4 FINISH 	Mid	High	15	Non-chlorinated spray cleaner/degreaser and a microfiber cloth. Don't use harsh abrasives, acids or chlorine-based cleaners or cleaning tools. Heavier soiling can be removed using a paste of baking soda on a damp sponge or light duty cleaning pad.	LEED supportive, excellent recycled content.	100% fire proof, vandal resistant, durable material, corrosion resistant, upscale appearance. Good performance in hose-down environment.	#4 brushed finish fingerprints and scratches but can be buffed to minimize scratch. Moderate to higher end visual appearance.

PRODUCT	INITIAL COST	LIFE CYCLE COST	WARRANTY	INITIAL COST: High, Mid, or Low based on full range of costs for similar materials. LIFE CYCLE COST: High, Mid, or Low based on full range of costs for similar materials. WARRANTY: Number of years. MAINTENANCE	SUSTAINABILITY	PROS	CONS
Stall Partition / Urinal Screen							
STAINLESS STEEL - TEXTURED 	Mid	High	15	Non-chlorinated spray cleaner/degreaser and a microfiber cloth. Don't use harsh abrasives, acids or chlorine-based cleaners or cleaning tools. Heavier soiling can be removed using a paste of baking soda on a damp sponge or light duty cleaning pad.	LEED supportive, excellent recycled content.	100% fire proof, vandal resistant, durable material, corrosion resistant, upscale appearance. Good performance in hose-down environment.	Textured finish disguises fingerprints and scratches, scratches can be buffed to minimize scratch. Moderate to higher end visual appearance.
QUARTZ WITH STAINLESS STEEL DOORS	High	Low	15	Low quartz maintenance, mild soap solution and wiped dry. Avoid harsh chemicals. See stainless steel partitions section for door maintenance. Good performance in hose-down environment	LEED supportive, GREENGUARD Certified, excellent recycled content, hygienic.	100% fire proof, large range of colors, upscale visual appearance, durable, resistant to scratches, stains and impact, antimicrobial and no sealers required. Product development opportunity for manufacturers.	More difficult to install. Lack of manufacturers, custom application.
GRANITE WITH STAINLESS STEEL DOORS 	High	Low	15	Low stone maintenance except for periodic resealing. Mild soap solution and wiped dry. Avoid harsh chemicals. See stainless steel partitions for door maintenance.	LEED supportive within 500 mile radius.	100% fire proof, vandal resistant, durable material, corrosion resistant, upscale appearance. Good performance in hose-down environment.	More difficult to install. Initial granite sealer required and periodic resealing.

PRODUCT	INITIAL COST	LIFE CYCLE COST	WARRANTY	INITIAL COST: High, Mid, or Low based on full range of costs for similar materials. LIFE CYCLE COST: High, Mid, or Low based on full range of costs for similar materials. WARRANTY: Number of years.			
				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Stall Partition / Urinal Screen							
BACK-PAINTED, LAMINATED SAFETY GLASS 	High	Low	2-10	Mild soap solution and wiped dry. Avoid harsh chemicals and abrasive pads.	LEED supportive, excellent recycled content.	100% fire proof, vandal resistant, durable material, corrosion resistant, upscale appearance. Good performance in hose-down environment.	More difficult to install. Lack of manufacturers.
Stall Partition - Type							
CEILING HUNG 	Mid	Low	NA	Mounting style provides unobstructed floor area and most economical maintenance.	NA	Mounting style provides unobstructed floor area and most economical maintenance.	Structural steel ceiling supports required to assure proper installation. Ceiling penetration may conflict with elements above the ceiling. Least stable system.
FLOOR MOUNTED/ OVERHEAD BRACED 	High	High	NA	More maintenance required around floor mounted pilasters.	NA	Sturdy - aluminum headrail keeps panels from racking. Keeps layout of ceiling fixtures and devices flexible.	Overhead bars susceptible to vandalism.
FLOOR MOUNTED 	Low	High	NA	More maintenance required around floor mounted pilasters.	NA	Flush top line is visually appealing. Suitable for low-ceiling spaces.	Requires deep anchoring into concrete floor. Less rigid as a system.

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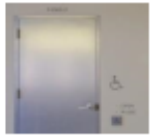
				MAINTENANCE	SUSTAINABILITY	PROS	CONS
FLOOR AND CEILING MOUNTED 	High	High	NA	More maintenance required around floor mounted pilasters.	NA	Extremely stable with pilasters anchored into both the concrete floor and structural ceiling support.	Ceiling penetration may conflict with elements above the ceiling.
Counter / Backsplash							
STONE 	High	Low	15	Low stone maintenance except for periodic resealing. Mild soap solution and wiped dry. Avoid harsh chemicals.	LEED supportive within 500 mile radius.	100% fire proof, vandal resistant, durable material, upscale appearance. Good performance in hose-down environment.	Initial granite sealer required and periodic resealing.
QUARTZ 	High	Low	15	Low quartz maintenance, mild soap solution and wiped dry. Avoid harsh chemicals. Good performance in hose-down environment.	LEED supportive, GREENGUARD Certified, excellent recycled content, hygienic.	100% fire proof, large range of colors, upscale visual appearance, durable, resistant to scratches, stains and impact, antimicrobial and no sealers required.	NA

PRODUCT	INITIAL COST	LIFE CYCLE COST	WARRANTY	INITIAL COST: High, Mid, or Low based on full range of costs for similar materials. LIFE CYCLE COST: High, Mid, or Low based on full range of costs for similar materials. WARRANTY: Number of years.			
				MAINTENANCE	SUSTAINABILITY	PROS	CONS
SOLID SURFACE 	Mid	Mid	10	Mild soap solution and wiped dry. Consult manufacturer for more stubborn stains recommendations. Good performance in hose-down environment.	LEED supportive low-emitting material and recycled content.	Class A fire rated, won't delaminate, durable, resistant to corrosion, graffiti, impact, mildew, moisture. Scratches can be buffed out. Matte finish is standard, least maintenance. Wide range of colors, upscale visual appearance.	Scratches and stains may occur but can be buffed out.
Room Door							
PAINTED STEEL 	Low	High	10	Periodic repainting due to marks and scratches from luggage and carts. Potential dents require replacement. Possible treatment for rust.	GREENGUARD Certified, recycled content.	Any color is available. Many standard sizes and levels of durability available.	Tend to look institutional. Require extra hardware for finish protection such as kickplates.
WOOD 	Mid	High	Life	Periodic refinishing due to marks and scratches from luggage and+E78 carts. Frame should be metal.	GREENGUARD Certified.	Brings natural warmth into space to contrast other hard finishes. Variety of colors and opacities available.	Tend to look institutional. Require extra hardware for finish protection such as kickplates.
STAINLESS STEEL 	High	High	15	Frequent cleaning of fingerprints. #4 finish more difficult to buff out scratches than other finishes. Rust - free.	GREENGUARD Certified, recycled content.	Very durable and abuse resistant. Ties in with other stainless steel finishes in restroom. Variety of finishes, patterns, and textures available.	Limited standard options. Often a custom product requiring longer lead time.

PRODUCT	INITIAL COST	LIFE CYCLE COST	WARRANTY	INITIAL COST: High, Mid, or Low based on full range of costs for similar materials. LIFE CYCLE COST: High, Mid, or Low based on full range of costs for similar materials. WARRANTY: Number of years.			
				MAINTENANCE	SUSTAINABILITY	PROS	CONS
ACCESSORIES							
Paper Towel Dispenser							
FOLDED 	Low	Mid	15	Needs to be refilled frequently.	C-fold towels are often not unfolded when used so more towels are used to dry.	Compact dispenser. "Touchless" in that you only touch the towel you use.	Towels frequently get stuck together so users pull out more towels than needed.
CENTER PULL 	Low	Low	5	Easy to refill.	Controlled feed eliminates excess waste.	Compact dispenser. "Touchless" in that you only touch the towel you use.	Difficult for people with limited mobility.
ROLL TYPE 	High	High	5	Semi-recessed models may require extra clearance for replacing towels.	Rolls are more sustainable in that they use less packaging and controlled feed eliminates excess waste.	Typically use a sensor so completely touchless. High capacity. Large rolls most economical.	Becomes a prominent element if not recessed. If sensor is aimed horizontally rather than downward it may sit too low on wall. Manual pull models susceptible to jams.

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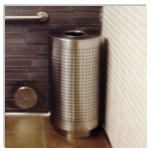
Sink Area Waste Receptacle							
FREE-STANDING 	High	High	1	Efficient to lift container and dump. Tend to show dirt and spills on outside. Can be too heavy for some cleaning crew , especially metal containers.	NA	Can provide large-capacity. Opportunity for accent finish.	Can obstruct circulation flow of people. Exposed plastic bags look sloppy. All kinds of trash are visible. Odors unhindered. Often located near entrance - a negative first impression.
SURFACE-MOUNTED 	Mid	Mid	1	Easy access for replacing trash bags. Stainless steel requires special cleaning. Typically require frequent emptying.	NA	Can be mounted anyw here. Semi-recessed options reduce negative impacts. Open receptacle easy to dispose into. Available combined w ith	Exposed plastic bags look sloppy. All kinds of trash are visible. Odors unhindered. Often overflow due to smaller capacity. Vulnerable to damage from carts and luggage. People may bump into them.
RECESSED 	Mid	Low	1	More steps to empty trash w ith keyed access. Less exposed surfaces to clean. Cleaning dirty interior tends to be neglected. Locks and doors add to potential repair issues.	NA	Perception of cleanliness because trash is hidden. Clean aesthetic. Out of the w ay of circulation.	Tend to have low er capacity spaces to fit into standard w alls so often overflow . Flipper doors impede disposal and can get very dirty.
ENCLOSED 	High	Mid	1	More steps to empty trash. Potential for large capacity trash containers, w hich may also be heavy to lift. Trash opening needs frequent cleaning. Can be aw kw ard to stoop under counter to empty.	NA	Perception of cleanliness because trash is hidden. Clean aesthetic. Easy to locate by sinks and paper tow el dispensers eliminating trail of drips on floor.	Disposal opening may be out of reach range for w heelchair users. Access doors and enclosures may require frequent upkeep.

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				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Hand Dryer							
BOTTOM ACCESS 	Mid	Mid	5	Floor and walls always wet.	See sidebar in 3.5.1: Spatial Components on Paper Towels vs. Hand Dryers	Easy access.	Blows water from hands onto wall and floor, creating perception of unclean restroom. Typically louder than other types.
TOP ACCESS 	High	High	5	Models without water collection leave floor wet. Some models have seems that encourage mold growth.	See sidebar in 3.5.1: Spatial Components on Paper Towels vs. Hand Dryers	Dries hands quickly. Some models have internal trays to collect water from hands.	Some models drip water on floor. High-speed air tends to be loud. Many people uncomfortable putting hands in enclosed space. Concerns about hygiene.
THROUGH ACCESS 	Mid	High	5	Easy access to water tray.	See sidebar in 3.5.1: Spatial Components on Paper Towels vs. Hand Dryers	Easy access. Off-sprayed water collected in tray behind hand opening.	Potential for water to spray off hands onto clothes or floor.
RECESSED 	Low	Low	5	Less surfaces to clean. Easy access to water tray.	See sidebar in 3.5.1: Spatial Components on Paper Towels vs. Hand Dryers	Good for tight circulation areas. Water collected in integral tray. Less cluttered look.	Awkward wheelchair access. Looks like trash receptacle.

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				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Hand Dryer							
FAUCET MOUNT 	Mid	Mid	5	If faucet or hand dryer requires service, both are shut down.	See sidebar in 3.5.1: Spatial Components on Paper Towels vs. Hand Dryers	Convenient. Eliminates dripping water on counters and floor. Convenient. This type is still in it's infancy, but seems to be the right concept.	Can be loud and bulky. Potential for accidentally activating dryer while washing hands and spraying hands on clothing.
Biohazard Disposal							
EXPOSED 	Low	High	Life	Easy to replace. Bracket and plastic container not very durable.	Plastic containers are recycled.	Inexpensive. Highly visible and recognizable.	Bright color often distracts from restroom color palette. Vulnerability to damage and theft.
SURFACE-MOUNTED 	Mid	High	Life	Key requires extra step to replace plastic container inside. More durable, but vulnerable to being bumped into.	Plastic containers are recycled.	Difficult to vandalize. Stainless steel matches other accessories.	Containers are small and need frequent replacement. Bright sticker still distracting.
RECESSED 	High	Low	1	Key requires extra step to replace plastic container inside. Larger container requires less frequent replacement.	Plastic containers are recycled.	Discreet and protected. Uses stock plastic container. Stainless steel matches other accessories.	Being recessed might make it difficult to locate.

PRODUCT	INITIAL COST	LIFE CYCLE COST	WARRANTY	INITIAL COST: High, Mid, or Low based on full range of costs for similar materials. LIFE CYCLE COST: High, Mid, or Low based on full range of costs for similar materials. WARRANTY: Number of years.			
				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Toilet Paper Dispenser							
SURFACE - STANDARD ROLL 	Low	High	1	More rolls to refill. Extra rolls reduce frequency of refill. Clean fingerprints from stainless steel.	Recycled materials.	Large capacity	Large housing. Difficult to locate under grab bar. Spindles can be damaged.
SURFACE - JUMBO ROLL 	Low	High	1	More rolls to refill. Larger rolls reduce frequency of refill. Clean fingerprints from stainless steel.	Recycled materials.	Large capacity. Less projection into space with some models.	Large housing. Difficult to locate under grab bar. Sideways paper feed awkward for some people.
RECESSED - STANDARD ROLL 	Mid	Low	1	More rolls to refill. Extra rolls reduce frequency of refill. Clean fingerprints from stainless steel.	Recycled materials.	Large capacity. Doesn't project into space. Combination units available. Easier to work around grab bars. Through-partition models available for standard stall partitions that reduce projection into space.	Requires thick partition. Spindles can be damaged.

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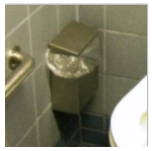
				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Toilet Paper Dispenser							
RECESSED - JUMBO ROLL 	Mid	Low	1	More rolls to refill. Larger rolls reduce frequency of refill. Clean fingerprints from stainless steel.	Recycled materials.	Large capacity. Doesn't project into space. Combination units available. Easier to work around grab bars. Combination unit reduces wall clutter.	Requires thick partition. Sideways paper feed awkward for some people.
Stall Waste Receptacle							
SURFACE 	Low	High	1	Frequent emptying. Change out trash bag.	Recycled materials.	Highly visible with easy access.	Lid can get in the way. Small capacity. Plastic bag visible on outside.
RECESSED 	Mid	Low	1	Frequent emptying. Change out trash bag. Flipper door easily soiled so needs frequent cleaning.	Recycled materials.	Doesn't project into space. Flipper door hides trash.	People apprehensive about touching flipper door. Plastic bag sometimes visible on outside.
COMBINED 	High	Low	1	Frequent emptying. Change out trash bag. Flipper door easily soiled so needs frequent cleaning.	Recycled materials.	Doesn't project into space. Flipper door hides trash. Combination unit reduces wall clutter. Larger capacity.	People apprehensive about touching flipper door. Plastic bag sometimes visible on outside.

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				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Seat Paper Dispenser							
INDIVIDUAL 	Low	Low	1	Simple refilling by replacing box. No back-up box so there may be times of empty dispenser or waste from removing partially full box. Clean fingerprints.	Recycled materials. Maybe waste from removing partially full boxes.	Minimal projection in to space. Also available recessed.	Can run out of paper without warning.
COMBINATION 	Mid	Low	1	Simple refilling by replacing box. No back-up box so there may be times of empty dispenser or waste from removing partially full box. Clean fingerprints.	Recycled materials. Maybe waste from removing partially full boxes.	Combination unit reduces wall clutter.	Can run out of paper without warning.
AUTOMATIC 	High	Low	Life of Install	Simple refilling by replacing refill container. No back-up container so there may be times of empty dispenser or waste from removing partially full refill.	Maybe waste from removing partially full refills.	Touchless. Should be always clean.	Users have no option but to sit on plastic.

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				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Shelf							
WALL-MOUNTED 	Mid	Mid	1	Cleaning fingerprints. Susceptible to vandalism.	Recycled materials.	Easy to add in any location.	Hazard for bumping into.
FOLD DOWN 	Low	High	1	Cleaning fingerprints. Spring may need replacement. Susceptible to vandalism.	Recycled materials.	Out of the way when not used.	Requires object with certain weight to keep down. May be too small for some belongings.
BUILT-IN 	High	Low	15	Varied rigor of cleaning depending on materials.	Varies by material.	Blends with restroom finishes. Flexibility in size and location. Durable.	Takes up more space. Can be difficult to reach if adjacent fixtures aren't sized and located to accommodate reach.

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				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Baby Diaper Changing							
FOLD DOWN 	High	High	5	Plastic is not as durable as stainless steel. Moving parts more vulnerable to damage.	Recycled materials.	Ergonomic. Folds out of the way. Recessed models will not get bumped. Stainless steel matches other accessories.	Often doesn't blend in with restroom aesthetics.
COUNTER - SURFACE 	Low	Mid	5	Plastic not as durable as other options. Straps may need replacement.	Recycled materials.	Convenient option for retrofit. Ergonomic.	Not as durable as other options. Materials may not complement other restroom finishes.
COUNTER - INTEGRAL 	High	Low	1	Varies depending on material. Very durable. Straps may need replacement.	Varies by material.	Blends in with restroom aesthetic.	Requires a pad. Hard surfaces can be cold and uncomfortable. Requires built-in "walls" around changing area and straps.

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				MAINTENANCE	SUSTAINABILITY	PROS	CONS
PLUMBING							
Sink							
WALL MOUNT 	High	Low	1	Surface Cleaning. Clean the overflow drain yearly.	One piece involves less materials and pieces.	Inexpensive, easy to install, readily available.	No counter space. Limited shape and appearance options. Can be unstable based on hanger style.
UNDER-COUNTER 	Mid	Mid	1	Surface Cleaning. Clean the groove between the counter and sink 2-3 times yearly. Periodic recalling at counter and sink joint. E160Clean the overflow drain yearly.	Varies depending on material.	Allows for flexibility in shape, counter material, and bowl material. Inexpensive, easy to install and readily available. Easier to clean the counter.	Sink can discolor over time. Surrounding counter gets wet. Surrounding caulking can discolor over time and be difficult to replace.
SELF RIMMING 	Low	Mid	1	Surface Cleaning. Clean the groove between the counter and sink 2-3 times yearly. Periodic recalling at counter and sink joint. Clean the overflow drain yearly.	Varies depending on material.	Allows for flexibility in shape, counter material, and bowl material. Inexpensive, easy to install and readily available.	Sink can discolor over time. Surrounding counter gets wet. Surrounding caulking can discolor over time and be difficult to replace.
INTEGRAL 	Mid	High	1	No joints to maintain. Uses same cleaning and repairs as counter.	Varies depending on material.	Seamless installation with counter tops.	Sink can discolor over time. Surrounding counter gets wet. Replacement is difficult and involved the counter top.

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				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Sink							
TROUGH 	Mid	Mid	1	Surface Cleaning. Clean the overflow drain yearly.	One piece involves less materials and pieces.	Eliminates wet countertops. Comes in single- and multi-user models. Multiple users at the same time maximizes traveler throughput.	Unwieldy to install, may requires additional structural support.
Faucet							
MANUAL 	Low	Low	1	Surface cleaning required.	Low flow options.	Allows users control. Cheapest option. Many manufactures, styles and finishes.	Eliminates touchless operations. Can be left running.
AUTOMATIC 	Mid	Mid	1	If battery powered will need to update as needed. Many small moving parts that need replacement. Can be hard wired, option to provide emergency power. Surface cleaning required, being cautious of the sensor.	Low flow options.	Sensor-operated faucets can operate 70% more efficiently. Touchless operation.	Higher initial cost than manual. If hardwired to standard power, can fail in a power outage.
SOLAR POWERED 	High	High	1	Many small moving parts that need replacement. Surface cleaning required, being cautious of the sensor and solar panels.	Solar powered and low flow options.	Self-sustaining runs on own power generated through small integral solar panels. Touchless operation.	Highest initial cost. In spaces with occupancy sensors for lighting and no ambient light, can be hard to maintain battery storage. Minimal options of styles and design can be bulky.

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				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Faucet							
TURBINE POWERED 	Mid	Mid	1	Many small moving parts that need replacement. Surface cleaning required, being cautious of the sensors.	Turbine powered and low flow options.	Does not require a power source. The use of the faucet spins a turbine to produce power. Sleek look and touchless operation.	Higher initial cost than manual. Minimal options of manufacturers.
Soap Type							
FOAM 	High	Low	NA	Less soap is required reducing refills and long term costs.	Less water needed to rinse soap from hands.	Less product is used. Can be stored in large quantities. Refill is less frequent. Washes down the drain more easily.	Fewer dispenser options.
LIQUID SOAP 	Mid	Mid	NA	More likely to clog drains.	Requires more water. Removing clogs typcially requires harsh chemicals.	Multiple manufacturer options. Multiple dispenser options.	Over time can clog pipes from remaining residue. Takes more water to rinse hands.

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				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Soap Dispenser							
AUTOMATIC 	Mid	Mid	1	Maintain small parts within the device and keep exterior clean. Refill soap.	Reduces the amount of soap used.	Touchless operation. Counter mounted which provides a sleek uniform look.	More expensive. Sensor can be unreliable. Wall mounted can be far away and cause messes.
MANUAL 	Low	Low	1	Refill Soap.	Least efficient option.	Simple operation. No moving parts. Counter mounted which provides a sleek uniform look.	Not touchless. Wall mounted can be far away and cause messes.
Soap Container							
BULK 	Mid	Mid	1	Refill large soap containers.	Limited wasted containers.	Large Bulk storage. Reduced frequency of refills. Reduces customer complaints. Back of house refill.	Large accessible area needed.
BOTTLE 	Low	Low	1	Replace bottle containers.	Requires more plastoic containers.	Individual container per faucet.	More waste created. More frequent changes needed. Staff has to enter restroom to refill. Can be stolen.

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				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Toilet							
BLOW OUT 	Low	Low	1	Clean. Maintain trap.	Low flow options.	Better drain carryout. Good in heavy use applications. Three bolt carrier.	Loud. Minimal low flow options.
SIPHON JET 	Mid	Mid	1	Clean. Maintain trap.	Low flow options.	Quieter operation. More economical. More low flow options. Four bolt carrier.	More likely to clog.
Toilet Flush Valve							
MANUAL 	Low	Low	1	Clean. Maintain Seals.	No energy usage.	Low Cost.	Not touchless.
AUTOMATIC 	Mid	Mid	1	If battery powered will need to update as needed. Many small moving parts that need replacement. Can be hard wired, option to provide emergency power. Surface cleaning required, being cautious of the sensor.	Low flow options.	Touchless environment.	Sensors can be tricky. Needs a power source.

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				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Toilet Flush Valve							
SOLAR POWERED 	Mid	Mid	1	Many small moving parts that need replacement. Surface cleaning required, being cautious of the sensor and solar panels.	Low flow options. Solar powered.	Self-sustaining runs on own power generated through small integral solar panels. Touchless operation.	Higher initial cost than manual. Minimal options of manufacturers. In spaces with occupancy sensors for lighting and no ambient light, can be hard to maintain battery storage.
TURBINE POWERED 	High	High	1	Many small moving parts that need replacement. Surface cleaning required, being cautious of the sensors.	Low flow options. Turbine powered.	Does not require a power source the use of the urinal spins a turbine to produce power. Touchless.	Higher initial cost than manual. Minimal options of manufacturers.
Urinal							
STANDARD FLOW (1 gpm) NA	Low	Low	1	Maintain trap. Clean.	Least efficient option in terms of water usage.	Rinses bowl more thoroughly.	Large water usage.
WATERLESS NA	Mid	Mid	1	Replace cartridges/manual flush. Maintain trap. Clean. Clean down stream piping annually.	No water usage.	No water usage.	Odor complaints. A203Difficult and unappealing to maintain.

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				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Urinal							
LOW FLOW (0.5 gpm) NA	Low	Low	1	Maintain trap. Clean.	Lower water usage.	Reduced water usage.	Pipe corrosion possible.
PINT (0.125 gpm) NA	Mid	Mid	1	Maintain trap. Clean.	Low water usage	Low water usage while still rinsing piping.	Pipe corrosion possible.
Urinal Flush Valve							
MANUAL 	Low	Mid	1	Clean. Maintain Seals.	No energy usage.	Low Cost.	Not touchless.
AUTOMATIC 	High	High	1	If battery powered will need to update as needed. Many small moving parts that need replacement. Can be hard wired, option to provide emergency power. Surface cleaning required, being cautious of the sensor.	Low flow options.	Touchless environment.	Sensors can be tricky. Needs a power source.

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				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Urinal Flush Valve							
SOLAR POWER 	High	High	1	Many small moving parts that need replacement. Surface cleaning required, being cautious of the sensor and solar panels.	Low flow options. Solar powered.	Self-sustaining runs on own power generated through small integral solar panels. Touchless operation.	Higher initial cost than manual. Minimal options of manufacturers. In spaces with occupancy sensors for lighting and no ambient light, can be hard to maintain battery storage.
TURBINE POWERED 	Mid	High	1	Many small moving parts that need replacement. Surface cleaning required, being cautious of the sensors.	Low flow options. Turbine powered.	Does not require a power source the use of the urinal spins a turbine to produce power. Touchless.	Higher initial cost than manual. Minimal options of manufacturers.
Drinking Fountain							
SURFACE MOUNTED 	High	Mid	1	Surface clean. Maintain filter cartridges as necessary. Maintain compressor or parts. Maintain trapway.	Optional high performance refrigeration systems.	Easily visible. Parts more accessible. Multiple design options.	Protrude into walkway. May require a cane guard.
Bottle-filling Station							
MANUAL 	Low	Low	1	Maintain filters.	Reduces waste of plastic bottles.	Simple, low maintenance.	Doesn't track usage. Not touchless.

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				MAINTENANCE	SUSTAINABILITY	PROS	CONS
Bottle-filling Station							
AUTOMATIC 	High	High	1	Maintain filters, moving parts, display screens.	Reduces waste of plastic bottles.	Counts usage. Touchless. Multiple manufactures.	More expensive.
ELECTRICAL							
Lamps							
LED 	High	Low	5	Driver or LED module replacement possible for some fixtures.	LED is technically an electronic component, which needs proper recycling.	No relamping needed. Long fixture/lamp life. Lower wattage, saving energy.	Slightly higher initial cost. LED technology is changing rapidly and component compatibility may be an issue for future maintenance.
FLUORESCENT 	Mid	Mid	1	Ballast replacement possible. Biannual relamping of fixtures.	Mercury content in lamps.	When a lamp or ballast fails it's replaced inexpensively.	Needs re-lamping, ballast failures, sockets dry out over time from heat.