CITY OF MANOR

Stormwater Fee Feasibility Study

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RAFTELIS

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1. Stormwater Program Summary

1.1. Background

The City of Manor provides numerous public services to its citizens to promote public safety, attract businesses, and maintain and improve the quality of life. Many of these services relate either directly or indirectly to management of the stormwater drainage system infrastructure, which includes storm sewers, roadside drainage, streets, and other components, or to improving water quality in the City's streams and receiving waterbodies. The costs associated with providing these basic services are increasing, as are the water quality regulations to which the City is subject. It is anticipated that the area will experience continued suburban expansion related to the growth of nearby urban center, Austin. Manor's stormwater management activities are performed using equipment from the Streets Department, personnel from the Streets department and GBA, the City's contracted Engineering consultant. These activities are currently funded under the Streets Department budget, which draws funding from property tax revenues.

1.2. Current Program

The City of Manor funds services to fulfill obligations required by the City's Phase II Municipal Separate Storm Sewer System (MS4) permit, issued in 2015 by the Texas Commission on Environmental Quality. The City maintains storm drainage systems, inspects construction sites, investigates suspicious and illicit discharges, and participates in public outreach and education. GBA helps draft documents required for MS4 compliance and the City submitted a renewal application in 2019.

The Streets department employs a full-time stormwater inspector, who conducts one-time inspections for any new development, annual inspections for post-construction devices and City sites, and inspections in response to suspicious and illicit discharges as required by the City's MS4 permit. The inspector also conducts bi-weekly inspections for construction site stormwater control measures and additional inspections following more than one inch of rainfall, as a part of each site's Stormwater Pollution Prevention Plan (SWPPP). SWPPP inspections are paid for by permitting fees. GBA schedules and reviews inspections and issues violations and notices to developers. The City is in the process of refining the permitting fees. Subdivision projects currently pay 3% of the total construction cost for utility inspections. No inspection fees are currently charged for general commercial projects. The City is also developing an ordinance to enforce sediment and erosion control requirements on home builders for individual home construction sites.

For public outreach, GBA drafts several mailers and pamphlets which the City distributes. These materials are purposed to educate the public on stormwater pollution. GBA is in the process of mapping the storm inlets in the City. GBA notifies the City or HOA (depending on the responsibly party) if storm inlet or detention pond maintenance is needed. One year and two year post-construction warranty inspections are also performed. The maintenance and inspection records are not currently recorded and stored in a computerized maintenance management software (CMMS). The existing storm sewer network, including pipe size, inlets, and connectivity, within the older parts of the City is mostly mapped and maintained in GIS. When a new development project is closed out, as-built CAD files are provided to GBA from the developer's engineer. GBA maintains a GIS layer of the storm sewer network and updates the storm network in GIS as this new information is provided.

For each storm inlet, it is planned that Streets staff will install a medallion which informs the public that the inlet drains to a water body. GBA also holds training sessions with City staff on Illicit Discharge Detection and Elimination (IDDE) and good housekeeping practices and performs updates to the City's Operations and Maintenance Manual.

The City's Streets crew oversees all drainage maintenance in Parks and public rights of way. The crew spends less than 5% of their time on drainage related activities. The City's Code of Ordinances states that residents are responsible for maintaining drainage ditches on their own property. The City does maintain a small number of roadside ditches to which the ordinance does not apply, including 34.13 acres of drainage easements. Roadside drainage is inspected whenever a road is constructed or repaved.

In recent memory, the City has implemented one capital project to improve stormwater drainage. In 2016-17, the City dug two new drainage ditches along Caldwell and Bastrop streets. The project was initiated after a Council member received calls from constituents due to frequent flooding and was funded with bond proceeds. Due to the need expressed by the community this project was prioritized over a street repaving project. The project was designed to convey a 25-year storm and addressed the frequent flooding in the area. The total project cost was $290,360.

The City's stormwater management plan was submitted to the Texas Commission on Environmental Quality (TCEQ) in July 2019 and has not yet been approved by TCEQ. The City is currently in year 3 of 5 of its MS4 permit term. There is currently no permit or TMDL requirements for installation of water quality BMPs. For new and redevelopment, stormwater detention of peak runoff flows is required such that post-construction peak flows do not exceed pre-construction peak flows from the site.

1.3. Future Operating Program

City leadership, public, and City staff have expressed attitudes toward an enhanced stormwater program that does more for the Citizens of Manor. Many residents have called the Streets department due to blockages, flooding, and standing water on their street. In addition to increasing the City's capacity to respond to these calls, staff want the program to evolve to be more preventative and proactive, through more frequent replacement and management of storm drains and stormwater infrastructure. Manor is a growing City. Enhancing the City's stormwater management is a necessary adaptation to growth and also makes Manor a more attractive location for businesses and new residents.

As stated earlier, property owners in the City of Manor are responsible for ditch maintenance (mowing) and keeping culverts and ditches free of obstruction. If property owners need assistance with removing debris or cleaning culverts, property owners can call or email Public Works for assistance. These roadside ditches often get blocked, which can lead to flooding or standing water spreading to nearby properties and the right of way. The City commonly gets calls related to these blockages. Staff anticipates the current ordinance may be changed at some point, in which case the City could begin maintaining these residential ditches and culvert pipes to prevent flooding. Additionally, staff expressed that it would be beneficial to establish more proactive maintenance of ditches, culvert pipes, and easements currently within the City's scope. Taking on these responsibilities would require the Streets department to add 2 to 3 more full-time personnel, additional equipment including a Gradall and Dump Truck, and payment of dumping fees. Hiring a drainage crew would reduce the workload of the Streets crew, allowing them to focus solely on streets maintenance and construction. As currently modeled, costs related to enhanced ditch maintenance kick in in FY2028, though

other future costs (above and beyond the current program), discussed below, are planned for nearer-term implementation.

The City's downtown storm drainage system is in generally good condition and the City experiences little flooding. However, it is an aging system and staff expressed that maintenance and possible replacement may be needed for some assets. The City wants to be prepared for storm events and address these issues early by proactively investing in existing infrastructure renewal. This repair and replacement work could be completed by additional crew members discussed above. The funding required depends on labor and material costs and the condition of the City's storm drains and downtown system. A closer inspection and survey of the City's storm drainage assets and addressing any gaps in the mapping of the existing storm sewer network will help the City develop a proactive schedule of maintenance and replacement.

There are some activities under the City's MS4 stormwater program that staff feel could be enhanced to meet state permit requirements. One of these is street sweeping. The City is tasked with implementing a street sweeping program to keep trash and debris off of roads and prevent contaminants from flowing into waterways. Doing so would require the purchase of a street sweeper, the payment of dumping fees, and adding an additional staff member. Depending on the level of service for this program, this staff member could also be pulled into other stormwater and streets maintenance duties. Options for service include sweeping all streets on a cycle, or sweeping areas based on complaints. Additionally, the City seeks to reinforce its good housekeeping activities such as trainings and inspections moving forward.

A second area of improvement to meet permit requirements is the illicit discharge detection and elimination (IDDE) program. Staff have developed a handbook and a customer hotline is being setup in 2022. Currently, the City has limited capacity for IDDE inspections which they would like to improve in 2023 and beyond.

Currently the water department has a vactor trailer that is shared with the street/drainage department for stormwater work. The water department also shares shares a 6-yard dump truck and a 3-yard dump truck with the street/drainage department. For the 2023 budget, the street department has requested a XL3100 used Gradall truck for cleaning drainage ditches and a 12-yard tandem dump truck for hauling in and off materials. In the future, staff indicate the streets/drainage department will need their own vactor trailer, street sweeper (Timco 600 or equal), and a 12-yard dump truck.

1.4. Future Capital Program

The City has funded one stormwater capital project in the past in response to citizen complaints as noted above, but has not established a sustaining capital program dedicated to stormwater. Staff have identified some potential projects that have been talked about internally and through public comment. There are a few suburban streets in Manor which frequently hold standing water after a 1-inch rain event. These are a common source of calls. Manor staff report that fixing the standing water issues require reprofiling the roadways. The budget needed to reprofile these streets would depend on the size of the area being reprofiled, with work performed by the City's Streets crew. A list of roads fitting this description and estimated project costs is being developed by GBA. Other potential projects mentioned were the conversion of wide drainage ditches to multi-use areas, replacing ditches with curb-gutter, and converting roadside drainage to centralized drainage.

GBA will also be performing a stormwater master plan in the future which will take about 6 months to complete. The master plan will identify any additional areas of flooding and help prioritize additional capital investment needs. Placeholders for capital improvements will be included in the stormwater funding requirements and can be phased in and modified as the program matures.

1.5. Stormwater Program Costs Summary

Figure 1.1 Current Program

Category	Cost Description	SW Program Rationale	Annual Cost	Notes
MS4	1 FTE Salary & Benefits	Inspecting construction and post construction SCMs, City sites, retention ponds, illicit discharges	$76,100	Fully burdened cost for foreman confirmed by City. One FTE, began in 2020.
MS4	GBA Contract for MS4 Compliance	Outreach, Education, Trainings, Documentation, Inspection Review	$30,000	Oversees MS4 compliance.
Operations	Maintenance	Upkeep of easements and roadside ditches	$25,000	Maintains drainage in Parks and right of way. Estimate of 5% of Streets crew time.
Capital	Past capital projects	One project to address flooding protection up to a 25-year storm	$290,360	No other current projects.

Figure 1.2 Future Program

Category	Cost Description	SW Program Rationale	Cost	Notes
MS4	1 FTE Salary & Benefits	Inspecting construction and post construction SCMs, City sites, retention ponds, illicit discharges	$76,100/yr	Fully burdened cost for foreman confirmed by City.
MS4	GBA Contract for MS4 Compliance	Outreach, Education, Trainings, Documentation, Inspection Review	$30,000/yr	Oversees MS4 compliance.
MS4	Stormwater Master Plan	Determine current and future needs of stormwater system	$150,000	

Category	Cost Description	SW Program Rationale	Cost	Notes
MS4	Storm Drain Medallions	MS4 requirement	$6,000	Cost is for medallions only. Assumes staff can install as part of regular field work.
MS4	Complete mapping and inventory of storm system and inlets/outfalls within GIS	MS4 requirement and proactive asset management	$30,000	GIS system allows for efficient O&M and asset renewal.
MS4	CMMS purchase and setup	Allows for efficient management of O&M work orders and tracking ongoing costs	$50,000	This cost may change if the City would like to utilize a CMMS to manage other department's O&M activities in addition to stormwater.
Operations	3 FTE Salary & Benefits	Additional Drainage Crew (2) and Streets Crew (1)	$205,500/yr	Assumes 1 foreman ($76,100) and 2 crew persons ($64,700 each). Drainage crew workload influenced by residential drainage ordinance. Proactive storm drains asset management.
Operations	Dumping Fees for Streets and Drainage cleanup	For cleaning drainage ditches and disposal of debris	$3,050/yr	Assumes two 20-yard dumpsters filled and disposed of 4 times per year based on ditches cleaned quarterly. $381 disposal fee for each 20-yard dumpster.
Operations	Drainage and Street sweeping-sweeper, fuel, equipment maintenance	Remove debris and decrease stormwater pollution entering waterways	$140,000	Sweeping of all streets each year. Assumes cost of purchasing street sweeper ($120,000) plus annual labor and fuel costs ($20,000). Approximate cost = $300/mile.

Category	Cost Description	SW Program Rationale	Cost	Notes
Operations	XL3100 Used Gradall Truck	Clearing of drainage ditches	$60,000	Dedicated for streets/drainage department
Operations	Dump Truck	Clearing of drainage ditches	$280,000	Dedicated for streets/drainage department. Estimate based on recent purchase.
Operations	Vactor Trailer	Cleaning storm system	$155,000	Dedicated for streets/drainage department. Estimate based on recent purchase.
Operations	Maintenance and Repair-Small Projects	Preventative and proactive maintenance of storm system	$100,000	
Capital	GBA support on capital planning	Identify/prioritize capital projects for 10 year period	$35,000	
Capital	2025 Capital Project	Reduce standing water and flooding	$500,000	Projects identified based on outcomes of SW Master Plan
Capital	2026 Capital Project	Reduce standing water and flooding	$500,000	Projects identified based on outcomes of SW Master Plan

2. Units of Service Analysis

Part of the Stormwater Fee Feasibility involves consideration of different rate structures. Impervious area units of service are a critical input to the rate structure analysis and modeling of potential rates. The methodology for establishing units of service for the City are described in this section.

2.1. Equivalent Residential Unit (ERU) Analysis

Generally, a stormwater utility's Equivalent Residential Unit (ERU) represents the typical impervious surface area of a single-family residential (SFR) property. Many utilities implement a simplified charge for all SFR customers. Single-family residential land parcels have similar characteristics, lending themselves to a simplified rate structure. They are also numerous and so it is also efficient, from an administrative viewpoint, to treat them the same. Since it is both equitable and efficient, many utilities adopt a single flat rate for this property class. Under a flat residential rate, customers are charged the same amount – typically for 1 ERU - regardless of size and amount of impervious area on an individual property. Fees for non-single family residential (NSFR) properties such as commercial, industrial, institutional, and multi-family properties would be calculated by their amount of impervious area per ERU or part thereof.

For this analysis, single-family residential parcels were identified through a visual review of City parcels. A parcel was selected if it contained 1-2 residences. Parcels intersected by the City boundary were included if the residence was contained within City limits.

The following analysis and results are presented by Raftelis to the City of Manor, Texas as a part of the Stormwater Rate Study. Task 3 of the agreed-upon scope of work includes an assessment to update the existing ERU value. The Rate Structure Analysis component will be provided in a separate deliverable.

2.1.1. Data

Raftelis' analysis was based 2020 aerial imagery of the greater Austin area taken by Sudex in 2020 and accessed on the Texas Natural Resource Information System. The analysis also used geographic tax parcels provided by the City in June 2022.

2.1.2. Methodology

A Raftelis analyst began by identifying parcels within the City that contained 1-2 residential structures, through a visual review of the aerial imagery. These 4,326 parcels were flagged as Single Family Residential. A random sample of 350 parcels was then taken from this grouping. This sample size was selected to ensure a reasonable level of confidence in the result. We ensured, by visual review of the sample parcels, that they encompassed a representative range of geography, structure age, and housing type. In some cases, an original randomly selected sample SFR property was not suitable to be included because it was obscured by vegetation or the residence was split between multiple parcels, both of which can impair the accuracy of measuring a typical residential property. In these cases, the analyst chose a visibly similar property from the same geographic region to replace that sample property. The final sample list is attached as Appendix A, and a map of the final, measured sample parcels throughout the City is shown below in Figure 2.1. The measured sample parcels are highlighted in yellow. Other parcels are in red.

Figure 2.1 SFR Sample Distribution

Using ArcGIS, overlaying parcels on top of 2020 imagery, the analyst created new spatial features to represent the impervious area on each property based on visual assessment of the property. Impervious surface is defined any surface that reduces the land's natural ability to absorb and hold rainfall. This includes areas that have been cleared, graded, paved, graveled, compacted, or covered with structures. Pools and decks were not considered impervious. The polygons were created to match the footprint on the ground of these surfaces, rather than rooflines which may be obscured by the angle of the aerial photography.

See Figure 2.2 below for a selection of digitized SFR properties. The sample property is outlined in yellow, the impervious area features created by Raftelis are translucent blue.

Figure 2.2 SFR Digitized Impervious Area Example

2.1.3. Results

Raftelis' 350 sampled parcels had a wide range of impervious area amounts, from a minimum of 1,111 square feet to a maximum of 17,965 square feet. The entire sample had a median value of 2,734 square feet of impervious area. The median is represented by the red line below.

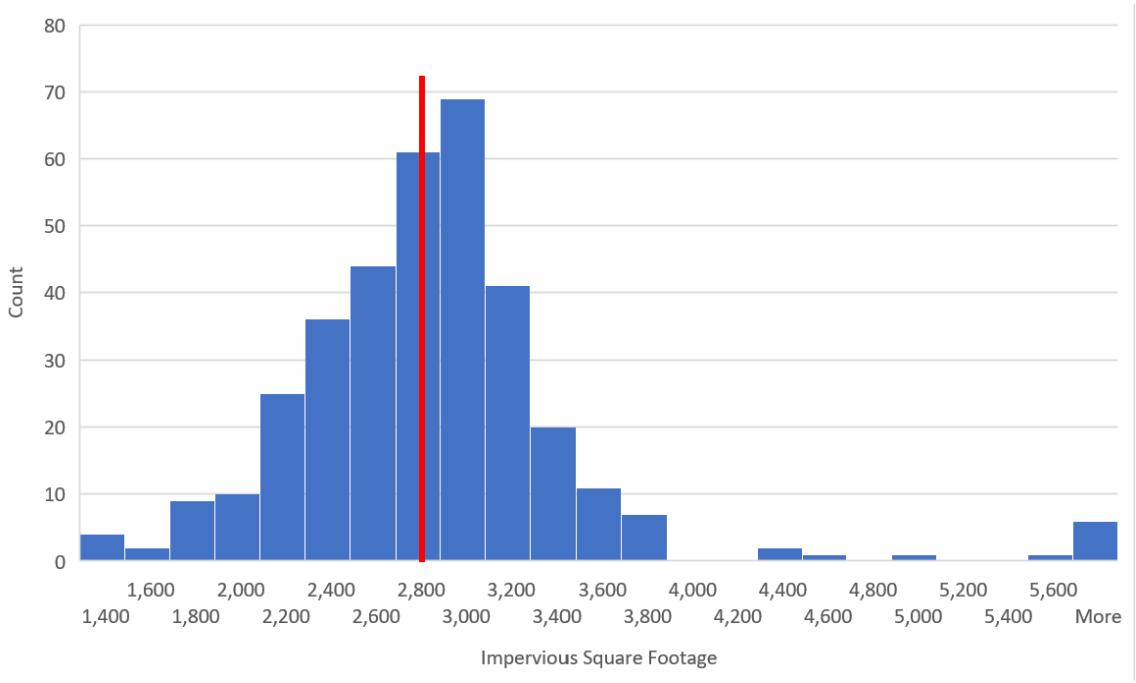

Figure 2.3 SFR Sample Impervious Area Distribution

Raftelis recommends that the City use an **ERU value of 2,730 square feet** in developing an impervious area rate structure for a potential stormwater fee. This value represents the median impervious surface area of sampled properties.

2.2. Total Units of Service Analysis

2.2.1. Methodology

For the ERU analysis above, a Raftelis analyst identified parcels containing 1-2 detached residences. Vacant parcels within platted residential subdivisions were identified as a separate class; SFR Future. These parcels are likely to have construction completed in the future and could be eligible to bill as SFRs once a certificate of completion is attained.

The remaining parcels were identified as Non-Single Family Residential (NSFR) properties. The distribution of SFR, SFR Future, and NSFR properties across the City is shown in Figure 4.

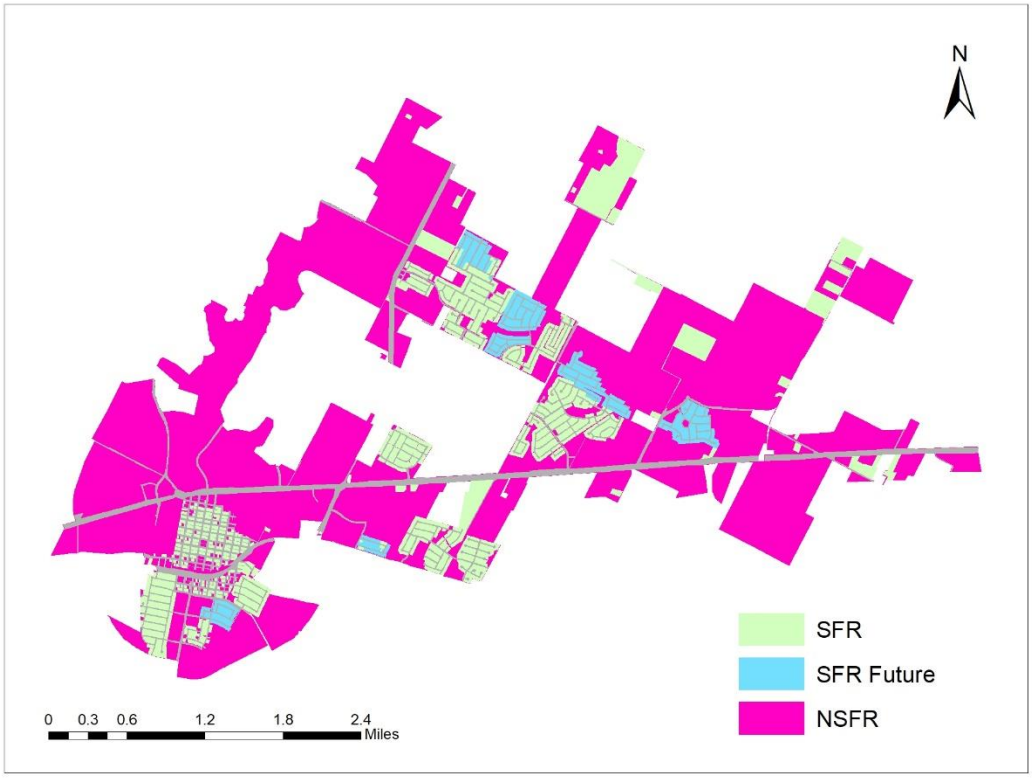

Figure 2.4 City of Manor Parcel Class Distribution

To estimate the impervious area for NSFR properties, our analyst reviewed each parcel and assigned a runoff factor by approximating the portion impervious area coverage on the parcel. Where a residence was split between two parcels, one parcel was identified as SFR and the associated parcel was tagged as NSFR with a runoff factor of 0. For each NSFR parcel the assigned runoff factor was multiplied by the gross parcel area to produce an estimated impervious area.

2.2.2. Results

The results of this estimate were compared with SFR properties using the 2,730 square feet ERU value estimated above. In Figure 2.5 below, each SFR property contains approximately 1 ERU of impervious area, or 2,730 square feet. The estimated impervious area for all NSFR properties (in square feet) was converted

into ERUs to produce an estimated **5,383** ERUs on non-residential properties, or **55%** of the impervious area in Manor. The proportion of ERUs is indicative of each class's contribution to stormwater runoff.

Figure 2.5 Parcels and Units of Service by Class

Class	Count of Parcels	ERUs	Percent ERUs
NSFR	863	5,383	55%
SFR	4,326	4,326	45%
SFR-F	1,340	-	0%
Total	6,536	9,223	

Because there is uncertainty in this initial estimate, we recommend using the resultant ERU values for the purposes of rate modeling, but acknowledge that calculated rates are preliminary and approximate until such time that the rate structure is determined and necessary data fully developed. A factor of conservatism is applied to these units through the collection rate in the inputs tab, described in Section 3.3.

3. Financial Planning Model

3.1. Overview

The financial planning model is a tool that summarizes the utility's revenues and expenditures in order to calculate the impact of a future event or decision. The model helps one visualize and plan the level of service of the utility and how each scenario impacts ratepayers. The model is meant to be a living document that is updated as the cost of expenditures changes and as new rates are approved. It is a customizable tool in which the user can manipulate rate increases, escalations, capital spending, debt, rate structure and more.

3.2. Dashboard

The dashboard is the focal point of the model. Use the dashboard to:

- Add an enhanced level of service (takeover of surface drainage maintenance)
- Change the year enhanced LOS scenario is implemented
- Add debt/bond proceeds to offset CIP
- Manually input rates and view resulting revenues against revenue requirements

Input values in the light blue boxes to drive the rate increase and LOS	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Stormwater Fee Increase			$ 6.50		$ 2.00	$ 1.50
Percent Change			100%	0%	24%	15%
Revenues			$ 719,409.00	$ 728,597.35	$ 964,955.96	$ 1,149,755.56
Revenue Requirements						
Total Operating Expenses	$ 131,100.00	$ 135,445.50	$ 483,912.62	$ 276,187.09	$ 267,721.13	$ 276,274.15
Total CIP	$ -	$ -	$ 143,221.50	$ 327,818.10	$ 675,305.29	$ 463,709.63
Total Debt Service		$ -	$ -	$ -	$ -	$ -
Subtotal: Revenue Requirements	$ 131,100.00	$ 135,445.50	$ 627,134.12	$ 604,005.19	$ 943,026.41	$ 739,983.78
Transfer from General Fund						
Surplus/Deficit			$ 199,526.00	$ 412,338.00	$ 639,338.00	$ 804,497.00
Ending Cash Balance						
Operating Reserve Fund			$ 24,095	$ 70,801	$ 3,018	$ 90,830
Operating Reserve Target			*$ 159,095*	*$ 90,801*	*$ 88,018*	*$ 90,830*
Unfunded/Debt Service Needed			$ -	$ -	$ -	$ -
Proposed Debt- Series Bonds						
Proposed Debt- SRF Loan						
Capital Reserve Fund			$ 32,210	$ 70,024	$ 101,841	$ 354,817
Capital Reserve Target			*$ 300,000*	*$ 300,000*	*$ 300,000*	*$ 300,000*

Figure 2.1 Dashboard

3.3. Inputs

The inputs tab has a variety of other settings which control the model.

Collection Rate- Percent of customers for which the utility expects to collect full payment. Entering a value less than 100 assumes a reduction in collections as a result of non-payment. Non-payment is sometimes higher for stormwater-only customers, or customers with only stormwater service on the account. Reducing the collection rate also effectively accounts for a range of error in the non-residential units of service estimation (Section 2.2).

Credit Reduction- An additional percent reduction in billing units resulting from customer participation in credit or discount programs. Other utilities who have implemented credit programs typically see impacts totaling less than 2% of revenues. Credit program participants usually see a maximum 20-50% reduction in their bill.
Customer Growth- percent increase in billing units by class, indicative of construction of new impervious areas. Insights such as permit applications and COs issued can help inform these growth rates.
Residential Tiers- When "On", the model assumes the use of residential tiers in place of a flat rate for all SFR customers (see Section 4, Rate Structure Analysis). A tiering scenario alters the number of residential ERUs, and associated revenues, by a small amount.
Operating Reserve Goal- number of days the utility could sustain the program using operating reserves, based on the operating costs listed for each fiscal year. As the model is currently built, revenues must meet the operating reserve goal before flowing to the capital reserve fund.
Capital Reserve Goal- dollar amount that acts as an arbitrary target for the capital fund. Goal is on the fund proof and fund balances but does not affect any calculations.
Escalation Rates- annual percent increase in costs which accounts for inflation. Can be altered based on category of cost, as selected in the operating tab.

Adjusted Revenues			
	FY 2024	**FY 2025**	**FY 2026 & beyond**
Collection Rate	95%	95%	96%
Credit Reductions	0.0%	0.5%	1.0%
Customer Growth			
Residential	1.00%		
Non-Single Family Residential	1.50%		

Figure 2.2 Inputs

3.4. CIP

The City has not identified any specific capital improvement projects, but projects will be identified through the stormwater master plan and other capital planning initiatives. The model currently includes placeholders for a project in 2025 and 2026 and $100,000 annually reserved for ongoing maintenance, repair and asset renewal.

Account	Description	Escalation	FY 2021	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
			Revised Budget	*Actual*	*Budget*	*Projected*	*Projected*	*Projected*	*Projected*	*Projected*	*Projected*
Future	Maintenance and Repair- Small Projects	General	$ -	$ -	$ -	$ -	$ 106,090	$ 109,273	$ 112,551	$ 115,927	$ 119,405
Future	GBA support on capital planning	General	$ -	$ -	$ -	$ -	$ 37,132	$ -	$ -	$ -	$ -
Future	Future Project Placeholder	General	$ -	$ -	$ -	$ -	$ -	$ 218,545	$ 337,653	$ -	$ -
Future	Future Project Placeholder	General	$ -	$ -	$ -	$ -	$ -	$ -	$ 225,102	$ 347,782	$ -
Future	Future Project Placeholder	General	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Future	Future Project Placeholder	General	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 358,216
Future	Future Project Placeholder	General	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Future	Future Project Placeholder	General	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Subtotal -			***$ -***	***$ -***	***$ -***	***$ -***	***$ 143,222***	***$ 327,818***	***$ 675,305***	***$ 463,710***	***$ 477,621***

Figure 2.3 CIP

3.5. Operating Costs

Costs in this section were developed based on the program summary and discussions with City staff. The bottom section of this tab shows costs in 2022 dollars, and the top section escalates costs based on factors defined by category in the inputs tab. Costs in red in the bottom section are linked to the enhanced LOS scenario (surface drainage).

Note: The version of the model at time of this report has descriptions in the bottom section formatted to call attention to certain costs. Items in red are linked to the enhanced level of service associated with the Future Program, as described above.

Year	Description
2022	1 FTE Salary & Benefits
2022	GBA Contract for MS4 Compliance
2022	Stormwater Master Plan
2022	Maintenance
2022	Storm Drain Medallions
2022	Complete mapping and inventory of storm system and inlets outfalls within GIS
2022	CMMS purchase and setup
2022	Street Sweeper
2022	2 FTE Salary & benefits- Foreman & Crew Member
2022	1 FTE Salary & benefits- Crew Member
2022	Dumping Fees for streets and Drainage Cleanup
2022	XL3100 Used Gradall Truck
2022	Fuel and Maintenance
2022	Dump Truck
2022	Vactor Trailer

Figure 2.4 Operating Costs

3.6. Units of Service

The NSFR units in this tab were estimated using the method described in 2.2.1.
SFR units can be shown as either a flat rate or tiered rate. Using a switch on the Inputs tab, the user is able to turn residential tiers "On" or "Off". Switching between rate structures leads to a slight adjustment in units. For further explanation of the distinction between these rate structures, see Section 4.

The number of parcels for each residential tier is calculated using a runoff factor. The runoff factor, or C-factor, is the portion of the parcel covered by impervious surfaces. This factor was determined using the sample of 350 residential parcels measured in 2.2. A runoff factor was calculated for each parcel individually, by dividing impervious area by gross parcel area. The average for the sample was 0.43 or 43% impervious. For each Single Family Residence (SFR) in the "Parcels" tab, this runoff factor is multiplied by the gross area to produce an impervious area and corresponding tier.

Tier breakpoints are adjustable and influence the size and ERU within each tier. Parcels are placed in Tier 1 if they are less than or equal to the breakpoint. Parcels are placed in Tier 2 if they are greater than the first breakpoint, and less than or equal to the second breakpoint. Parcels are placed in Tier 3 if they exceed the second breakpoint.

The tier ERU is the median impervious area within the tier, divided by the ERU. The user is able to manually enter an ERU for each tier, informed by this calculated value. The number of units is the product of the tier ERU and parcels within the tier.

	Runoff Factor (Used to predict impervious area)	0.43						
	ERU	2,730					FY 2024	FY 2025
Single Family Residential	*Selected Rate Structure:*	Flat						
Tiers								
Tier	**Breakpoints (sq. ft.)**	**Median within Tier**	**Tier ERU**	**Rounded Tier ERU**	**Number of Parcels**	**Units of Service**		
1	2,400	2,145	0.79	0.80	1,097	878	886	895
2	3,400	2,581	0.95	1.00	2,609	2,609	2,635	2,661
3	Over	4,116	1.51	1.50	620	930	939	949
					Sum:	4,417	4,461	4,505
Flat Rate					4,326	4,326	4,326	4,369
					Subtotal: Residential Units	4,326	4,326	4,369
					% Change			*1.0%*
Non-Single Family Residential					865	5,383		
					Subtotal: Non-Residential Units	5,383	5,383	5,463
					% Change			1.5%
Future Residential					1,340	0		
					Conservative Adjustment:	-5%		
					Total ERUs:	**9,223**	**9,223**	**9,341**
					% Change			1.3%

Figure 2.5 Units of Service

3.7. Fund Proof

This tab summarizes the source and flow of revenues into the operating fund and capital fund and how those revenues are used.

Cash flows into the operating fund where it is spent on operating expenses. Cash flows to meet the operating reserve fund goal defined in the inputs tab. Any surplus to that goal flows into the capital reserve fund to be spent on capital projects.

Rather than showing a negative balance, the capital reserve fund will show the unfunded portion of projects, or the amount of debt needed to complete the projects in the CIP tab. Any available funds are spent on projects listed for the fiscal year, without accounting for the reserve target. If there is a surplus of funds transferred from the operating fund after project costs, they accumulate in this fund.

The user can add additional transfers between the operating and capital reserve funds as desired.

Stormwater Capital Fund	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
FY Beginning Fund Balance		$ 32,210	$ 70,024	$ 101,841	$ 354,817	$ 102,196	$ -
Transfer to Operating Fund	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Transfer from Operating Fund	$ 175,431	$ 365,631	$ 707,121	$ 716,685	$ 225,000	$ 314,989	$ 649,838
Proposed Debt- Series Bonds	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Proposed Debt- SRF Loan	$ -	$ -	$ -	$ -			
Planned CIP	$ 143,222	$ 327,818	$ 675,305	$ 463,710	$ 477,621	$ 491,950	$ 506,708
Surplus/ (Deficit)	$ 32,210	$ 37,814	$ 31,817	$ 252,976	$ (252,621)	$ (176,961)	$ 143,131
Unfunded/Debt Service Needed	$ -	$ -	$ -	$ -	$ -	$ 74,765	$ -
Capital Reserve Target	*$ 300,000*	*$ 300,000*	*$ 300,000*	*$ 300,000*	*$ 300,000*	*$ 300,000*	*$ 300,000*
FY Ending Fund Balance	$ 32,210	$ 70,024	$ 101,841	$ 354,817	$ 102,196	$ -	$ 143,131

Figure 2.6 Fund Proof

3.8. Debt Schedule

This tab is not currently being used but is capable of showing debt service calculations, if needed. The user can input proceeds in the dashboard tab and view the schedule of repayment on this tab based on the input term and interest assumptions.

			FY 2023	FY 2024	FY 2025	FY
FY 2024 Series Bonds				*1*	*2*	
Issuance	$	100,000				
Insurance	$	-				
Issuance Costs	$	2,000				
Debt Service Reserve (1)	$	7,018				
Principal	$	109,018		$1,505.04	$ 1,587.82	$
Interest				$ 5,996.00	$ 5,913.22	$
Less: Capitalized Interest						
Total Payment				$ 7,501.04	$ 7,501.04	$
Year End Principal Balance				$ 107,513.11	$ 105,925.30	$ 1

FY 2024 Series Bonds Assumptions

Term	30
Interest Rate	5.50%

Figure 2.7 Debt Schedule

3.9. Rate Calculation

This tab shows information related to categories of costs and revenue requirements. It calculates an annual rate that is each year's revenue requirements divided by the units of service and benchmarks this rate against the override rate entered in the dashboard.

The calculated rate does not account for the buildup of reserve funds and allows rates to fluctuate up and down based on yearly revenue requirements. Where the calculated rate is less than the override rate, additional funds are being absorbed into reserves. Where the calculated rate exceeds the override rate, this indicates a higher-cost year where funds are being drawn from reserves. In any year the calculated annual rate shows the minimum rate needed to sustain the utility at its current level.

Calculated Annual Rate per ERU	$ 75.63	$ 72.30	$ 108.42	$ 109.04
Annual Rate per ERU	$ 78	$ 78	$ 102	$ 120
		0%	*31%*	*18%*

Figure 2.8 Rate Calculation

4. Rate Structure Analysis

Raftelis held discussions with City staff on 10/06/22 and 11/29/22 in which several rate structure options and their advantages and disadvantages were presented. The rate structure ultimately depends on what the charge is based upon, so discussions first focused on the data basis for the fee, then shifted into the structuring of how properties may be charged.

4.1. Basis

The industry standard for stormwater fees is to charge based on each property's impervious area (IA). Impervious area defines surfaces that are covered or compacted with material that slows infiltration of stormwater; such as pavement, concrete, pavers/stones, structures, and compacted gravel and dirt. The amount of impervious area on a parcel is most directly related to the quantity of stormwater to be handled by the system. Impervious surface causes the peak discharge volume of runoff from a parcel of land to be higher than it would otherwise. It also contributes to increased concentrations of pollutants in the runoff as these pollutants are not able to soak into the ground.

Impervious area can be estimated using an intensity of development factor (IDF) or runoff factor (C-factor). In some cases it can be estimated using tax assessment data. The most accurate way to measure impervious area is to capture it using GIS tools. Raftelis looked into a predictive equation for impervious area using parcel and tax data. Raftelis did not believe the results of the equation were accurate enough to apply to the City's stormwater billing. As part of the Units of Service Analysis, a runoff factor was assigned to each non-residential parcel to predict impervious square footage. In the City of Manor, there are 241 non-residential parcels identified as having impervious area. Increased accuracy could be achieved by measuring this subset of parcels using GIS tools.

A few agencies use gross area as a component in their charge. As opposed to impervious area, gross land area contributes proportionately more to the nutrients and pollutants that stormwater runoff may pick up and less to the sheer volume of runoff to be managed. Pervious cover absorbs more rainfall and contributes less to runoff. However, pervious land still contributes pesticides, fertilizers, leaves, and other undesirable materials to the runoff that does occur.

4.2. Structure

Utilities typically bill properties based on their classification. Most commonly customers are identified as Single Family Residential (SFR) or Non-Single Family Residential (NSFR), or similar terms in order to distinguish commercial and residential properties. Agencies with a significant portion of other distinct land uses or parcel types sometimes opt for additional classifications, for example agricultural land or townhomes.

SFR properties are typically charged a single, flat rate (1 ERU) or placed into tiers and charged one of several rates. The utility may choose square foot breakpoints to manipulate how many properties fall in a tier and what they are charged. In order to tier properties, the impervious area for each property must be predicted or measured. In Manor, there are approximately 4,326 residential parcels to measure. Some utilities elect to place a cap on the SFR class, in which outlier properties with impervious area above a certain threshold are charged as NSFR. This approach also requires measurement of residential parcels.

NSFR Properties are typically charged per Equivalent Residential Unit (ERU) of impervious area. It is common to charge NSFR properties a minimum of 1 ERU. The number of ERUs can be rounded up or down to the nearest whole integer or the utility may charge for portions of ERUs. Rounding ERUs arguably simplifies billing and communication, as many customers receive similar charges. Charging for fractional ERUs in some ways conflicts with the purpose of a billing unit like an ERU, as it is conceptually similar to charging per impervious square foot. On the other hand, charging for partial ERUs prevents customers from being "tipped over" into a higher ERU.

It is standard practice to exempt NSFR properties with less than some threshold of impervious surface area (for Manor, we propose 400 square feet). This helps reduce billing errors resulting from minor inaccuracies in parcel geometry, such as impervious area overlapping onto a neighboring property. Properties fitting this description, as calculated by the runoff factor approach, were exempted from the Units of Service estimation.

Another approach brought to the attention of the City was the use of a base charge. A base charge covers fixed costs that are the same for all accounts regardless of impervious area. Billing and collections, data management and updating, programming, and customer support may fall within this category. These costs, then, are distributed evenly to each account holder by being allocable to a fixed charge per parcel.

5. Recommended Rate Structure and Rates

5.1. Rate Structure

This recommendation considers industry standards, data availability, equitability, administrative burden, and stormwater program cost drivers. Manor's program is developing and focused on MS4 permit compliance and flooding prevention. Manor is not subject to any TMDLs or other major water quality requirements that largely impact the cost of the program.

As part of analyses performed in Section 2, an analyst reviewed parcels in the City against 2020 imagery. A runoff factor was assigned to each NSFR parcel. During this analysis, the analyst noted the following:

- There was a wide range of resulting runoff factors
- A majority of NSFR parcels had a runoff factor of 0 indicating no development or impervious area, including parcels holding natural areas or streams
- There are several large undeveloped or mostly undeveloped properties with a runoff factor below 5 percent

In summary, the gross area of parcels in the City is not always related to the owner's ability to pay, the extent of development on the property, or the property's impacts to the City's stormwater cost drivers.

In regards to fixed costs, the City does not have a substantial amount of easily identifiable costs that could be reallocated towards a base charge. A charge of this nature also increases the complexity of the rate structure. This option could be reconsidered as the City incurs additional costs.

Raftelis recommends using **impervious area** as the basis for the stormwater fee. Impervious area is both a simple and accurate rate structure that is closely tied to the amount of runoff a property contributes. The City's costs relate directly to the conveyance of this runoff. Impervious area is a defensible approach as it is the industry standard for stormwater utilities.

Raftelis recommends billing customers as **Single Family Residential** or **Non-Single Family Residential** based on their land use. This is a common approach to Stormwater billing and aligns with billing practices for other City utilities.

Raftelis recommends charging Single Family Residential properties a **flat rate** of 1 ERU. A tiered structure requires capturing or estimating impervious area for approximately 4,325 properties. Additionally, tiering adds administrative burden due to an uptick in customer calls when neighboring properties are placed in different tiers. This presents data management and customer service challenges for the City. A flat structure is equitable, requires sufficient revenue, and is an accepted method used by utilities throughout the US.

Raftelis recommends charging Non-Single Family Residential properties **per whole ERU**, with a **minimum of 1 ERU** charged to properties with impervious area exceeding 400 square feet. Raftelis recommends measuring this subset of properties for the most accurate billing.

	Recommendation	Discussion
Basis	Impervious Area	Industry Standard Simple & accurate
Single Family Residential Structure	Charge a flat rate of 1 ERU per property	Simple to administer Widely used
Non-Single Family Residential Structure	Charge properties per ERU based on measured IA Charge a minimum of 1 ERU if the IA exceeds 400 sq ft	Closely relates to impacts Widely used

Figure 5.1 Summary of Rate Structure Recommendations

5.2. Rates

As described in Section 3, the model is highly adjustable to fit different scenarios and levels of service. This rate recommendation funds the stormwater program to a level prescribed below:

- The City takes on additional surface drainage responsibilities for an enhanced level of service beginning in FY 2028
- The City cash funds a robust capital program including planning, asset maintenance and repair, and two large projects
- The City initially prioritizes capital projects over building an operating reserve to meet the operating reserve target. This is accomplished through interfund transfers from the operating fund to the capital fund according the following schedule, as input in the Fund Proof tab:

FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
$135,000	$20,000	$85,000		$225,000

- The City funds the following capital projects. Costs will be refined through near-term study of watershed and drainage needs:
  - 2025 Capital Project
  - 2026 Capital Project
  - Smaller Projects related to Maintenance and Repair

Based on this scenario the recommended rate per ERU for the City is as follows:

FY 2024	FY 2025	FY 2026	FY 2027
$6.50	**$6.50**	**$8.50**	**$10.00**

Figure 5.2 Rate Recommendation

Based on the results of this study, this schedule of rates should allow the City to fully cash anticipated operating and capital costs. Future rates beyond FY 2027 may need further adjustment to meet these criteria.

5.3. Summary

Sections 1 through 5 of this document summarize the results of tasks 1-4 as part of the Stormwater Fee Feasibility Study Scope of Work. Section 6 enumerates implementation recommendations as part of task 5, and task 6 involves the drafting and presentation of this report.

The City of Manor performs a number of services to support stormwater management. There is desire for the City to ramp up these activities for a more proactive program that supports the quality of life in Manor and makes it an attractive location for businesses and residences. Recovering these costs through a stormwater fee benefits the City by providing a stable and sufficient revenue stream, increasing awareness of stormwater management in the community, establishing reserve funds to grow and mature the stormwater utility over time, and funding activities and projects for a resilient, safe, and clean community. An impervious area rate structure is an effective way to link the cost drivers of the stormwater program, i.e. stormwater runoff, with impacts to ratepayers.

6. Implementation Recommendations

Recommendations and results from the feasibility study, documented in sections above, propose an approach to charging a stormwater fee to property owners in Manor. The City's chosen rate structure and planned program determine how stormwater fees will be generated for each customer.

Applying calculated stormwater fees to customer's accounts accurately and completely, maintaining trust in the utility billing system, fostering understanding of changes to customer's bills, and responding to customer inquiries, among other responsibilities, require a separate phase of planning to ensure a successful fee implementation and fee process moving forward.

6.1. Data Development

The proposed rate structure is based on impervious area. The impervious area for residential properties is estimated to be 1 ERU per property. For non-residential properties, 5,383 ERUs were estimated in the Units of Service Analysis (Section 2.2). Increased accuracy could be achieved by measuring the 241 parcels identified as having impervious area. This measurement could be performed in GIS and would take approximately 30 hours to complete.

6.2. Data Maintenance

After go-live, updated customer data related to the stormwater fee will need to be consumed on a regular basis, and customer's fees updated accordingly. Such data includes new aerial imagery (impervious area removals and additions), parcel changes (subdivisions, recombinations, lot line adjustments, ownership), inclusion of new customers (issuing of COs, new permit applications), and updates in response to customer complaints or appeals. Imperious area data will need to be maintained and tracked in response to all these sources. A change detection table is one method used to track IA updates.

New stormwater-only accounts (charged only for stormwater service) will need to be created as impervious area changes are detected on parcels without an existing account. A customer may be eligible to charge for stormwater before they apply for water or sewer service. Customers who do not currently pay for water, sewer, solid waste, or other City services are also eligible, provided they fall within City limits and contain impervious area. Discussions with City staff indicate that there would be a limited number of these types of accounts.

6.3. Public Outreach

Materials such as FAQs, fact sheets, website content, flyers, and bill inserts can help educate customers on how and why the City is changing its approach to stormwater funding. Messages can be communicated at Council meetings, public meetings, and community events.

6.4. Customer Service

Customer Service staff will need to be educated on how to answer basic customer questions, and how to elevate more challenging calls to related to the stormwater fee. Customer Service can expect the largest volume of calls at go-live and additional help such as a call center or hotline may be needed.

6.5. Billing Policies

Some customers may call the City and appeal the amount of their stormwater fee. Establishing policies for how these cases are handled can help the utility prepare for and effectively respond to these calls.
Other billing policies include hierarchy of payments, penalty for nonpayment, discounts, and credits.

6.6. Staffing and Workload

Maintaining customer data, responding to customers, and ensuring accurate and complete billing adds workload for City staff. Defining roles, workflows, and responsibilities can help these processes run more efficiently.

6.7. Billing System Configuration

In most cases, impervious area data related to stormwater is housed outside of the billing system, typically in a geodatabase. The City's billing system will need to be configured so that updates to this data can be consumed and applied to customer's bills. Updates could be performed manually or through an automated interface. The billing system may need to allow discounts or credits based on billing policies developed by the City.

6.8. Bill File Development

An initial bill file will need to be developed and QCed prior to go-live to be loaded into the City's billing system. The format and fields contained in this file will need to be determined by City staff based on specifications of the billing system.

Appendix A
Final SFR Sample Parcel IDs

233620206	239690322	241770307	243750203
233620303	239690728	241750909	243750504
233621731	239690111	239770913	243750215
233621718	239690215	245720358	243750305
233621702	239690921	245720379	243750615
233650410	239690905	245720373	243750620
233621517	239690911	245720396	243770429
233621714	239690915	245720804	243750632
233650111	239690333	233591606	237621305
233650112	239690701	235690639	242800290
233621626	235720424	235721506	231620118
233621613	239750502	235690905	231590816
233622002	239690821	235721312	231620324
235690504	239690316	235690644	231620326
235690522	239690717	235690649	231620303
235690510	235720474	235721009	231620302
235690524	235720467	239890105	231620301
243720522	235721217	235690916	233622104
243720527	235721213	245720148	241750610
245720332	235720479	245720105	241770114
243720712	235720480	245720932	241750613
243720426	237690115	245720933	241750614
243720433	233650311	245720971	241750322
245720321	235590905	247690112	241771210
245720343	235591303	247690406	241770820
243720513	242700310	247690410	241771212
243720710	239750308	247690407	241771637
245750306	239750407	247690415	241750621
233720118	241750507	245720945	241771635
233720111	241750518	245720964	241771508
235720513	241750519	247690104	241771217
235720522	231590627	245720926	247720341
235720405	231590621	245720956	247720234
235720203	231590613	239771106	247720230
235690720	231590509	241770908	247720227
235720207	231590506	241770921	247720223
235690706	231590707	241770922	247720328
235690715	231590433	239770901	247720405
235720402	231590210	241770711	247720401
235720221	231590223	243750307	247720502
235720212	231590208	243770411	247720305
235720805	231590306	243770512	241771612
235720956	231590636	243770414	243751011
235720423	233591505	243770204	247750101
235720957	233592231	243770401	247720916
239750419	233592233	245770106	247720808
235720432	233591513	245690415	247720813
239750429	233592123	245690508	247720818
239750606	233591321	245690713	247720815
239750620	233592105	245690510	247721001
239770206	233592010	247690605	235691313
239750625	235592103	245690304	243751403

235720413	233591431	245721608	243751306
235720959	233591430	245721410	243751223
235720431	233591104	245721603	243751231
239750426	233591022	245720994	247720921
239750430	233590903	245721503	247720554
237621402	233591723	245721504	247720453
237621402	233591721	243720302	247720551
237622201	233591728	243720308	247720931
235590802	233591729	245720949	247720451
235621803	233591715	245720946	247720933
235623306	233591417	241770810	247720944
237621601	233591301	241770903	247720430
235620503	233591332	245720993	247720539
235621304	233591604	239771306	247721013
235622406	239750518	241770616	247721123
235622605	245750406	241790103	247721119
237621309	245720703	241790204	247721111
237620805	245750233	241770710	247721115
235590402	245750235	241770713	233590401
235621103	245750242	239771301	233620619
235621403	235690627	241790206	233590701
235591103	235721604	239790102	233590804
235591402	235721605	239771316	233590313
239690103	235721402	239771317	237590603
239690210	235721408	239771322	245750209
239690609	235622102	241771022	245750216
239750519	239750718	245720525	241771304
239750520	239750716	245721241	241771313
239691041	239750714	245720537	241750615
239691023	239750907	247720106	241750323
239691001	239750910	247720105	241771326
239690513	239750903	247720103	241771324
239690832	239750746	247720202	241771609
239690834	233592019	241770706	245650116
239690310	235592002	243770430	
239690711	245720136	243750630	