



Legislation Details (With Text)

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Title: Street Sweeping Operations Update
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Date	Ver.	Action By	Action	Result
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TO: Mayor and Members of City Council
THRU: Adam Lindsay, Assistant City Manager
FROM: Sheila Thomas-Ambat, PE, CCM, CFM, Public Services Director
Lee Jernigan, PE, Assistant Public Services Director
DATE: June 7, 2021
RE: Street Sweeping Operations Update
COUNCIL DISTRICT(S):
All

Relationship To Strategic Plan:

Desirable Place to Live, Work and Recreate

Executive Summary:

Staff has prepared an update to City Council on street sweeping operations in the City. Staff will present existing resources, describe sweeping operations, as well as, challenges encountered; and respond to Council's questions.

Background:

During a presentation at Council's regular meeting on April 12, 2021 about Illegal Dumping, Council asked questions regarding the Public Services Department Street Sweeping Operations. Staff advised they would return at an upcoming work session to provide information about street sweeping resources and operations.

Issues/Analysis:

Sweeping Resources

- 11 Total Street Sweepers
 - 9 Regenerative Air Type - These are the sweepers most commonly used in our operation. These sweepers use circulating brooms to direct the material toward the sled, which uses regenerated air to lift the debris into the filters that screen the material and recirculate the air back into the system. They are effective at collecting a variety of materials such as leaves, pine straw and light sand which is common in the Fayetteville area.
 - 2 Mechanical Sweepers - These sweepers are commonly focused on areas where debris may be bigger/thicker/heavier and use circulating brooms to direct the debris toward a conveyor belt that continuously feeds the debris into the hopper. These are effective at collecting heavier debris such as bigger limbs, stones and broken glass. These sweepers have the ability to 'high dump' remotely into a dump truck or roll off container, reducing travel time to and from the dump site.
- 8 FTE's
 - These employees cover 6 sweeping zones along residential streets and 2 sweepers are dedicated to sweeping NCDOT roads within the City daily.

Sweeping Zones

- 6 City Zones
 - Currently the City is divided into 6 sweeping zones along residential streets. There is 1 sweeper dedicated to each of these zones daily when sweeping operations are conducted, typically during a 10 hour work day, Monday - Thursday. The sweeper operates with a goal that every street within that zone (with curb and gutter) is swept within a quarter (once every 3 months). After the zone is completed, the sweeper starts over at the beginning of the zone.
- NCDOT Roads
 - Currently the City has extended a municipal agreement with NCDOT for reimbursement to sweep NCDOT streets every quarter (once every 3 months).
 - 2 sweepers are dedicated to sweeping NCDOT roads daily with the goal of sweeping every road (with curb and gutter) within a quarter (once every 3 months). Typically, staff exceeds this goal and routinely sweeps NCDOT curb and gutter streets 6 to 8 times per year.
 - The current agreement for 2021 outlines a reimbursement from NCDOT in the amount of \$125,991 and is reimbursed quarterly.
 - The current agreement added a section of NC 210 (Murchison Road) from I-295 northward to the end of the concrete barrier rail towards Spring Lake. City forces and NCDOT forces partnered on May 25, 2021 to conduct a comprehensive cleaning of the area so that future sweeping could be conducted more effectively along the inside lane concrete barrier wall. Approximately 30 cubic yards of material was collected and removed by all forces (approximately 3 dump truck loads.)
- Curb and Gutter vs Strip Paved Streets
 - Curb and Gutter - Sweeping operations are performed typically only on roads that have

curb and gutter drainage systems, or center raised concrete islands. These barriers are normally 4" - 6" tall and provide a restriction so the debris does not escape the roadway surface during rainfall. Instead, the debris deposits in the gutter so the sweeper can collect it.

- Strip Paved - Strip paved roads have a paved shoulder edge that adjoins a grass shoulder and/or an open drainage ditch. This drainage treatment does not restrict the debris from exiting the roadway during a rainfall event. Because the debris has exited the roadway onto the grass shoulder or ditch, the sweeper cannot collect it during an operation. Based on this we do not sweep strip paved roads on a usual basis which is consistent with the standard industry practice. Strip paved streets can be reviewed by staff on a case by case basis in the event an emergency situation or weather event has created an environment where one-time sweeping operations need to be conducted.
- Right of Way Asset Collection Assessment - Staff is initiating this study with a schedule to be complete in December 2021. This will be the tool to indicate which streets have curb and gutter and which streets have strip pavement. The data will provide improved mapping of the streets scheduled to be swept.

Sweeping Operations

- Pre - Trip Inspection of Sweeper
 - Prior to departing to the sweeping zone to begin the operation the operator conducts a pre-trip inspection that includes a visual inspection of tires, brooms, lights, etc., to detect any missing or broken components. They also inspect the engine(s) (some sweepers have 2 separate engines that operate the vehicle and sweeping equipment independently) for appropriate fluid levels, belt wear, etc. Lastly, they ensure all components within the cab are operational and complete a vehicle inspection report for that shift. This inspection takes approximately 20 minutes, if no defects are found.
- Travel to sweeping zone
 - Depending on the location of the streets within the sweeping zone, the sweeper may travel 10 - 25 minutes to reach the destination. The Street Maintenance Facility is located closest to the downtown area (Alexander Street) therefore the western and northern areas of the sweeping zones take the longest times to reach.
- Begin sweeping operation
 - The typically sweeping speed is between 3 - 7 mph (miles per hour) and is dictated by the amount and type of debris being collected. This speed is similar to a person's walking speed. Heavier debris, such as thick leaves or piles of dirt require the sweeper to slow down and could require multiple passes to collect.
 - The sweeping time to fill the hopper is also dependent on the amount and type of material being collected and averages approximately 2.5 hours. Sand material compacts more efficiently in the hopper and increases the amount of sweeping time. Leaves for example, do not compact well and may drastically decrease the amount of sweeping time and require more dumping operations.
- Travel time to dump site
 - Depending on the location of the streets within the sweeping zone, the sweeper may travel 10 - 25 minutes to reach the dump site. The dump site is located closest to the downtown area (near Ann Street) therefore the western and northern areas of the sweeping zones take the longest times to reach. After reaching the dump site, the sweeper dumps it's hopper and cleans any residual material from the gate to ensure the hopper is sealed. This operation takes approximately 15 minutes.

- Refill water tank
 - Each sweeper is equipped with capability to spray water during the sweeping operation mostly to reduce dust during sweeping and dampen the material to reduce equipment damage. The tank holds 240 gallons of water and is filled by attaching to a fire hydrant. Filling the tank takes approximately 15 minutes.
- Travel back to sweeping zone
 - After dumping and refilling the water tank the sweeper travels back to the sweeping zone. This takes approximately 10 - 25 minutes. Depending on the location of sweeping, the sweeper can complete 3 - 5 loads per day.
- Complete sweeping operation
 - At the completion of the daily sweeping operation, the operator will conduct a washout of the hopper and exterior components of the machine. This takes approximately 30 minutes, after which, the operator fills with fuel and water, completes the daily report forms and prepares for the next day totaling approximately 1.5 hours.
- Sweeping time
 - For a typical 10 hour sweeping shift, the actual sweeping time is approximately 6 - 7 hours.

Sweeping Challenges

- Limb Removal
 - For the regenerative air sweepers, larger debris within the curb line, such as limbs, either have to be manually removed and placed in the hopper or avoided by the sweeper (not desirable). This prevents the sweeper from becoming clogged with the debris, which requires maintenance. This can slow the sweeping operation speed.
- Overgrown vegetation
 - Overgrown vegetation that enters the roadway surface restricts the sweeper from traveling along the curb and gutter line close enough to collect the debris.
- Travel time
 - Travel time to and from the sweeping location to the dump site varies depending on the location of the sweeping operation and impacts the amount of actual sweeping time.
- Garbage Cans in roadway
 - Garbage cans create a significant challenge to sweeping operations when they are placed in the roadway. Coordination between sweeping operations and solid waste collection schedules are complex due largely to the resource allocation for each. Typically, 8 sweepers operate daily in the City with a schedule to complete all streets in a particular zone within 3 months. This is compared to 17 garbage trucks and 10 yard waste trucks that operate daily in the City that typically service each household twice per week. Due to the speed at which each operation functions, sweeping operations are not capable of 'following' solid waste routes because they could not complete the route before the next scheduled solid waste pickup day. To compound this issue, solid waste routes are not impacted by rain, however, sweepers cannot operate once rain becomes moderate or heavy. This occurrence further complicates the ability to follow solid waste. Lastly, a routine issue that arises with garbage cans involve citizens that complain when a can is placed in their yard as opposed to the roadway. Enforcement of this code may lead to more significant customer service complaints related to can placement. One option to address streets that have a large number of cans or other obstructions is to skip the street on the regular schedule sweeping cycle and return on

a periodic basis to 'catch up' the route.

- Weather/Seasonal Issues
 - The street sweeping schedule is on a quarterly basis (once every 3 months), so the opportunity exists that weather events, especially isolated thunderstorms with high winds and heavy rains, create debris within the street between scheduled sweeping operations.
 - Additionally, sweeping that occurs during loose leaf season, although coordinated with Parks and Rec collection operations, still experiences additional debris that collects in the street prior to another scheduled sweeping cycle.

Budget Impact:

This is an informational update item.

Options:

Staff is presenting this item based on a request received from City Council at their regular meeting on April 12, 2021. Staff will present information on the existing street sweeping resources and operations; and request direction from City Council for any revisions.

Recommended Action:

Staff will receive direction from City Council on any revisions to the program they request.

Attachments:

Presentation