

2022 Street Improvements

Owner: City of Willow Park | Engineer: Jacob Martin, LLC | Contractor: XIT Paving & Construction Inc.

Background

- Pre-construction
 - An inventory of the City’s existing streets was performed including arterial, collector, and local streets.
 - An evaluation was made of the condition of each street and improvements recommended based on the type of street, traffic volume, condition, and community input.
 - Local streets that saw lower traffic volume as well as lower weight vehicles were reconstructed, while streets that saw heavier traffic volumes and loads warranted more expensive concrete paving.

- Post-construction
 - A signed petition was submitted to the City Council on May 14th, 2024 from residents of Willow Park regarding remedies for roadway safety and property damage.
 - The key elements of the petition included speeding on Crown Road, narrow drive approaches, roadside ditch grading/slope, and landscaping damages.
 - City staff set forth to explore the issues comprehensively and present our ideas for a resolution.

Project Description

- The 2022 Street Improvements project consisted of removing and replacing approximately 36,500 square yards of existing asphalt pavement with concrete paving and replacing approximately 18,600 square yards of asphalt pavement with 2” hot-mix asphaltic concrete (HMAC) pavement. The project also included roadside ditch grading, driveway replacement, and new bike lanes.
- The streets included in the 2022 Street Improvements project were Crown Road, Ranch House Road, King's Gate Road, Sam Bass Road, Old Ford Road, Sam Bass Court, Trinity Court, Trinity Drive, Crested Butte Court, Ridge Haven Court, and Ridge Haven Court.

Project Goals

- Improve Road Infrastructure
 - Rehabilitate pavement
 - Promote bicycle mobility
- Improve Surface Drainage System
 - Protect property from the potential damages caused by storm water runoff.
- Reduce Infrastructure Costs
 - For the streets that were identified as in need of major rehabilitation, consideration was given to the type of improvement that resulted in the most economical solution while providing the longest life cycle for the street.

Residents' Concerns

- Roadside Ditch Grading/Slope
- Narrow Drive Approaches
- Landscaping Damages
- Neighborhood Traffic Calming

Roadside Ditch Grading/Slope

- Design Criteria
 - Earthen slopes shall have proper vegetative cover and be no steeper than three horizontal to one vertical (3:1)
 - Roadside ditches and culverts designed to convey the design storm
- Residents' Concerns
 - Steep roadside ditches
- Resolution
 - Ensure 3:1 ratio is met

Drive Approaches

- Design Criteria
 - Residential driveways to serve single-car garages, carports and/or storage areas shall be not less than eleven feet (11') nor more than fifteen feet (15') in width, measured at the property line.
- Residents' Concerns
 - Narrow drive approaches.
- Resolution
 - The estimated cost to widen the driveways on Crown Road an additional two (2) feet is **\$144,000**. The cost to widen driveways an additional four (4) feet is **\$192,000**.
 - The estimated cost to widen the driveways on Ranch House Road an additional two (2) feet is **\$39,000**. The cost to widen an additional four (4) feet is **\$52,000**.
 - All the driveways reconstructed on Crown and Ranch House Roads met or exceeded the city's design criteria.

Landscaping Damages

- Design Criteria
 - Roadside ditches must have proper vegetative cover to control erosion. Hydromulch seeding shall be in accordance with the Specifications located in the Contract Documents, Division 32 92 13 – Hydromulch Seeding, Section 2.1.
- Residents' Concerns
 - Vegetation is different from homeowner's cultivated landscapes.
- Resolution
 - Hydromulch (@ \$1.75/s.y.)
 - The estimated cost to hydromulch the city right-of-way along Crown Road is **\$17,000**.
 - Sod (@ \$15/s.y.)
 - The estimated cost to sod the city right-of-way along Crown Road is **\$145,725**.
 - Concrete Rip-Rap (@ \$89/s.y.)
 - The estimated cost of the total ditch area not already in concrete on Crown Road from the top of the hill to the end is **\$290,000**.

Neighborhood Traffic Calming

What is Traffic Calming?

According to the Federal Highway Administration (FHWA), traffic calming reduces automobile speeds or volumes, mainly through the use of physical measures, to improve the quality of life in both residential and commercial areas and increase the safety and comfort of walking and bicycling.

Traffic Calming programs involve:

- Applying road design and engineering measures to obtain appropriate speeds;
- Setting speed limits that are safe and reasonable;
- Applying enforcement efforts and appropriate technology that effectively address speeders and deter speeding.

Safety Benefits of Traffic Calming

Speed impacts crash severity

- Lower speeds result in greater survivability when crashes occur.

Slower speeds save lives

- Average risk of death for a pedestrian at impact rises as speed increases.
- A person walking struck by a person driving 40 mph is 8x's more likely to die than one struck by person driving 20 mph.

Slower speeds

- Promote safety in residential neighborhoods
- Prevent crashes
- Safer for pedestrians and cyclists, specifically where infrastructure does not exist.



DEATH DUE TO SPEED

U.S. DEPARTMENT OF TRANSPORTATION, LITERATURE REVIEWED ON VEHICLE TRAVEL SPEEDS AND PEDESTRIAN INJURIES, MARCH 2008.
SOURCE: <http://www.fhwa.dot.gov/infrastructure/infrastructure.cfm>

Traffic Calming Tools

- Vertical Deflection countermeasures create a change in roadway height that forces a vehicle to reduce speed. Examples include:
 - Speed Humps
 - Speed Bumps

Vertical Deflection

Speed Bumps

- Raised areas of pavement primarily used in parking lots
- They pose a safety hazard for vehicles traveling too fast and can be more damaging to vehicles.
- Emergency Response Impact - unknown as bumps are used primarily in parking lots



Speed Bump

Vertical Deflection

Speed Humps

- Rounded raised areas of pavement typically 12 to 14 feet long, often placed in a series (spaced 260 to 500 feet apart) at mid-block locations
- Appropriate for residential streets and residential collectors that are one-lane/two-lane and have posted speed of 35 mph or less
- Not typically used on major roads, bus routes, or primary emergency response routes.
- Series of speed humps may result in traffic diversion
 - Comprehensive traffic calming approach needed to ensure problem isn't moved to another roadway.
- Emergency Response Impact – Approximately 3 and 5 seconds delay per hump for fire trucks and up to 10 seconds for ambulances with patients.



Speed Hump

City of Willow Park Design Criteria

Subdivision Ordinance

Division 9. Subdivision Standards and Specifications

Sec. 10.02.243 Streets

(9) Driveways.

(A) One- and two-family residential driveways.

(ii) Residential driveways to serve single-car garages, carports and/or storage areas shall be not less than eleven feet (11') nor more than fifteen feet (15') in width, measured at the property line. Residential driveways to serve two (2) car garages, carports and/or storage areas shall be not less than eleven feet (11') nor more than twenty-four feet (24') in width, measured at the property line.

Sec. 10.02.244 Drainage

(6) All drainage facilities shall be designed and constructed in conformance with Exhibit A “Storm Drainage”.

Exhibit A “Storm Drainage”

B. Design of Facilities

1. Design of all bridges, culverts, underpasses and open channels are to be based on the 100-year frequency.

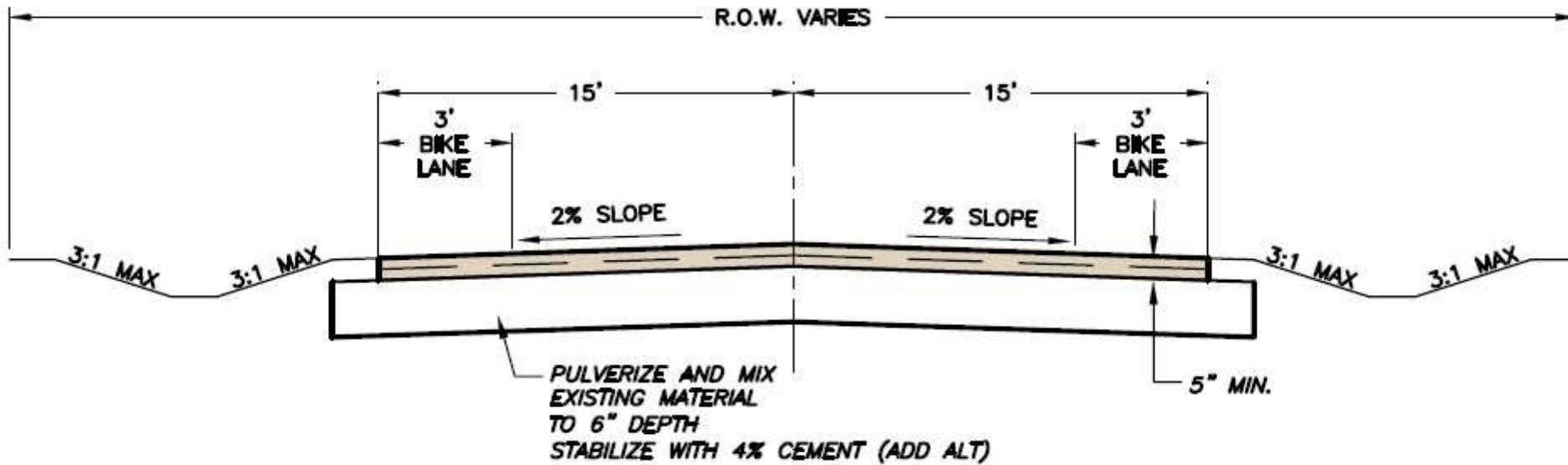
Street System Improvements

Priority and Type of Improvements

| Priority | Street | Begin | End | Length (LF) | Street Classification | Recommendation |
|----------|---------------------|------------------|--------------------|-------------------|-----------------------|----------------|
| 1 | Crown Road | Ranch House Road | Crown Valley Drive | 3,850 | Arterial | Concrete |
| 1 | Ranch House Road | Bridge | Castlemount | 2,378 | Arterial | Concrete |
| 1 | King's Gate Road | Crown Road | Vista Drive | 2,400 | Arterial | Concrete |
| 1 | Sam Bass Road | Squaw Creek Road | Ranch House Road | 3,650 | Local | Concrete |
| 1 | Old Ford Road | Squaw Creek Road | End | 1,600 | Local | Reconstruction |
| 1 | Sam Bass Court | Sam Bass Road | End | 1,300 | Local | Reconstruction |
| 1 | Trinity Court | Trinity Drive | End | 900 | Local | Reconstruction |
| 1 | Trinity Drive | Sam Bass Court | Ranch House Road | 1,450 | Local | Reconstruction |
| 1 | Crested Butte Court | Old Ford Road | End | 200 | Local | Reconstruction |
| 1 | Ridge Haven Court | Old Ford Road | End | 220 | Local | Reconstruction |
| 1 | Pleasant Court | Old Ford Road | End | 400 | Local | Reconstruction |
| | | | | Total Linear Feet | 18,348 | |
| | | | | Miles | 3.48 | |

Source: 2022 Capital Improvement Plan, Table V.1

Street Section Detail



REINFORCED CONCRETE PAVEMENT

N.T.S.

Source: 2022 Street Improvements Plans