City of Galveston

Architectural Projects
STAFF REPORT

March 12, 2019

To: Brian Maxwell, City Manager
Hon. Mayor and City Council Members

From: Dudley Anderson, Architectural Projects Manager

RE: Contract number - COG CON 18 176

Consider for approval authorizing the City Manager to amend a contract for professional services from Design Workshop, Inc. in the amount of $5,000 for a project to improve the pedestrian experience in the downtown area.

I. Background

A. The area bounded by 20th to 25th Streets and Church to Strand is scheduled for improvements to create a more secure and conducive experience for pedestrian traffic. We anticipate improvements to lighting levels, shade, and accessibility.

B. City Council approved a contract with Design Workshop, Inc. for professional services to design those improvements in the amount of $107,550 December 13, 2108.

II. Current Situation

A. The allowance for topographic survey services in the agreement has proven inadequate to cover the cost of those services.

B. The City requested Design Workshop include topographic survey services in their proposal with a limit of $20,000. Survey proposals were received by Design Workshop and ranged from $80,500 to $137,000.

C. City Staff discussed another approach to obtain the necessary survey information for the final design. This approach utilizes a mobile LiDAR system and is proposed by Design Workshop, Inc. at $25,000.

D. This is $5,000 more than the allowance included in the contract.

E. Engineering has confirmed this approach satisfies the need and Staff recommends the City proceed and asks Council to add $5,000 to the Design Workshop, Inc. contract.

F. Design Workshop, Inc. also asked for specific language to be added to the contract to acknowledge that they are not a licensed land surveying company. The City Attorney's office has reviewed this request and upon approval that language will be included in the contract amendment.

a. "The Work required by the Agreement shall be amended to include additional survey work by High Tide Land Surveying LLC ("Subconsultant") as outlined in the attached Exhibit A [ATTACH THE HIGH TIDE SCOPE LETTER AS EXHIBIT A TO AMENDMENT]. City acknowledges that Company is not a licensed land surveying company and shall not be required to become licensed as such, but that Company has agreed to retain the services of Subconsultant as part of the parties' Agreement as an accommodation to City. Company shall not be responsible for the quality or timeliness of Subconsultant's work, and neither the standard of care nor the indemnity provisions of the Agreement shall apply to Subconsultant's work. Instead, City shall be named as an intended third-party beneficiary of the subconsultant agreement between Company and Subconsultant, and shall look solely to Subconsultant for any alleged or claimed deficiencies in the work performed by Subconsultant."

G. Design Workshop, Inc. is ready to begin design immediately upon approval and execution of the amendment.

V. Alternatives in order of priority

A. Approve authorizing the City Manager to execute an amendment to the agreement for a design study for improvements to the downtown area in the amount of $5,000.

B. Do not approve the agreement.

VI. Recommendation

Approve authorizing the City Manager to execute an amendment to the agreement for a design study for improvements to the downtown area in the amount of $5,000.

VII. Fiscal Impact Report

Requested by:	J. Dudley Anderson, RA
	Architectural Projects Manager
Funding Source:	Public Infrastructure Silo
Costs of implementation:	$5,000

Respectfully submitted,

J. Dudley Anderson
Architectural Projects Manager

Design Workshop, Inc.
Landscape Architecture
Planning
Urban Design
Strategic Services

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Suite 401
Austin, Texas 78701
512.499.0222
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designworkshop.com

March 14, 2019

J. Dudley Anderson
City of Galveston
City Hall
823 Rosenberg
Galveston, TX 77550

Additional Services for: Downtown Galveston Pedestrian Study

Add Service Number: 1

Dear Dudley,

This letter is a request for approval to complete Additional Services associated with the survey for the Downtown Galveston Pedestrian Study. Based on the proposal for the survey from High Tide Land Surveying Inc [Exhibit A], which your office approved by email on February 14, 2019, we understand that the full scope for the survey exceeds the budget in our executed agreement with the City dated December 14, 2018, thus requiring this Additional Service agreement.

The scope of the survey is attached in Exhibit A and is based on our understanding from discussions at the project kickoff on January 18, 2019.

Assumptions and exclusions:

1. The work covered by this agreement will begin upon receipt from the City of a purchase order for the full survey cost of $25,000.
2. The Work required by the Agreement executed on December 14, 2018 shall be amended to include additional survey work by High Tide Land Surveying LLC ("Subconsultant") as outlined in the attached Exhibit A. City acknowledges that Design Workshop is not a licensed land surveying company and shall not be required to become licensed as such, but that Design Workshop has agreed to retain the services of Subconsultant as part of the parties' Agreement as an accommodation to City. Design Workshop shall not be responsible for the quality or timeliness of Subconsultant's work, and neither the standard of care nor the indemnity provisions of the Agreement shall apply to Subconsultant's work. Instead, City shall be named as an intended third-party beneficiary of the subconsultant agreement between Design Workshop and Subconsultant, and shall look solely to Subconsultant for any alleged or claimed deficiencies in the work performed by Subconsultant.

By signing this letter, you are authorizing Design Workshop, Inc., and its Subconsultant High Tide Land Surveying LLC to commence services for a fee of $5,000. This fee includes expenses required to complete the survey as originally identified in the contract executed on December 14, 2018.

Original Contract Amount: $107 ,550
Additional Services 1 Amount: $5,000
Total New Contract Amount: $112,550

Should you have any questions, please do not hesitate to contact me at (512) 647-2371 (office), 512.774.9191(cell phone), or chempel@designworkshop.com

Respectfully,

Claire Hempel

Claire Hempel, PLA, AICP CUD, LEED• Green Associate™
Principal

APPROVED BY CLIENT:
By: _____ Date:

Title:

Stephen C. Blaskey, RPLS 5856
8017 Harborside Drive, Galveston, TX 77554
P.O. Box 16142, Galveston, TX 77552 (Mailing)
(409)740-1517
Stephen@HighTideSurveying.com

Mrs. Erin McDonald:

It is our pleasure to provide you with the attached proposal, and if you have any questions or other things you would like to incorporate into this Scope of Work feel free to contact us.

1. INTRODUCTION

High Tide Surveying (HTS) is pleased to present the following proposal for the provision of LiDAR data acquisition and feature extraction services. HTS will provide:

- Real-Time RTK RTCMv3 (GPS and GLONASS) corrections
- Mobile LiDAR system
- Suitable Road Vehicle
- GPS/GLONASS and IMU Data Post Processing Services
- Final Cleaned and Registered Point Cloud in .LAS format
- Geo-referenced high resolution 4K digital imagery of the route
- Extracted features in AutoCAD format

2. PROPOSAL SUMMARY

This proposal covers the acquisition of LiDAR data, Georeferenced Video and Feature Extraction.

2.1. Establishment of RINEX Data Logging Station

Prior to any LiDAR data collection, a RINEX data logging station will be established in or around the center of the survey route. Normally the end-customer will provide the details of the preferred survey benchmark but in the absence of this information, HTS will establish a survey benchmark using the methods, procedures and guidelines for using survey-grade GNSS to establish vertical datum recommended by the local geodetic authorities. Raw RINEX GNSS data will be logged at the local survey benchmark throughout the duration of the project and combined with data from all other CORS stations in the area to facilitate GPS/GLONASS and IMU Data Post Processing.

2.2. Collection of scanning laser data (LiDAR) from both mobile and static laser scanners

The InteLAS™ range represents the very latest in mobile LiDAR technology, offering more features, and a superior price performance ratio, than any other mobile LiDAR system on the market today.

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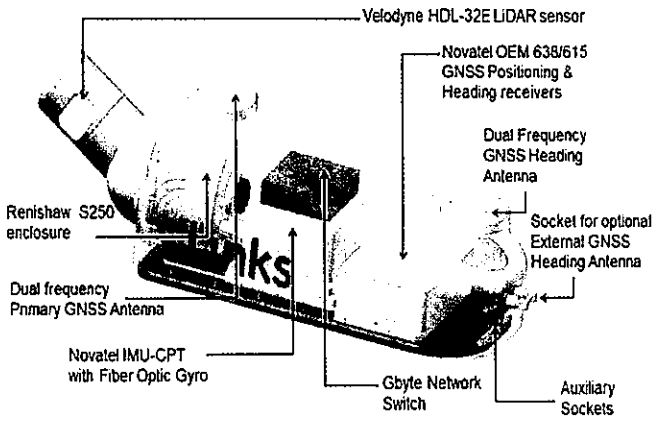
The InteLAS™ mobile LiDAR system is a stand-alone mobile LiDAR system comprising of the very latest motion sensing and positioning technology including a Tactical Grade Fiber Optic Gyro (FOG) based Inertial Navigation System (INS), a dual triple frequency GNSS positioning and heading system and a state-of-the-art scanning laser module (LiDAR).



The tightly coupled INS and GNSS sub-systems employ Novatel's proprietary SPAN (Synchronous Position, Attitude and Navigation) technology, enabling the system to deliver unrivaled real-time 3D position accuracies.

The InteLAS™, will be used to collect LiDAR data along the proposed survey area (Figure 1 below). The system is equipped with the Velodyne HDL-32E LiDAR sensor which comprises 32 individual laser pairs across a 40° vertical field of view and a capability to deliver up to 700,000 points per second at 100 meters range with unprecedented survey-grade accuracies of better that 0.1 – 0.2 foot. As the small errors introduced by the GPS/GNSS and IMU systems are magnified over range, the system accuracy will improve as the measured ranges become shorter.

2.3. Collection of geo-referenced images

A digital camera fixed to the LiDAR vehicle can collect geo-reference images from ground level. These images will be referenced in the same reference frame as the LiDAR data using the same RTK positioning source. Geo-referenced images have proven to be very helpful while analyzing the LiDAR data and aiding the feature extraction process.

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Proposed Survey Area - Approximately 72 acres

2.4. 3D Data Processing and DTM Modelling

To meet the challenges of collecting survey-grade LiDAR data from a vehicle moving at normal roadway speeds, GNSS IMU post-processing will be required. Raw GNSS and IMU data will be logged throughout the project at the local reference station, and on the mobile LiDAR system itself. The logged RINEX data will be downloaded from all available CORS reference stations in the area and combined into an adjusted network.

The vehicle trajectory will be re-computed both forwards and backwards along the route and the LiDAR data will be adjusted accordingly. If there are any traditional Land Survey ground shots available along the route, these can also be incorporated into the final 3D point cloud adjustment.

Novatel's Inertial Explorer post-processing software is a powerful, highly configurable processing engine that allows for the best possible static or kinematic GNSS accuracy using all available GNSS data. Inertial Explorer can

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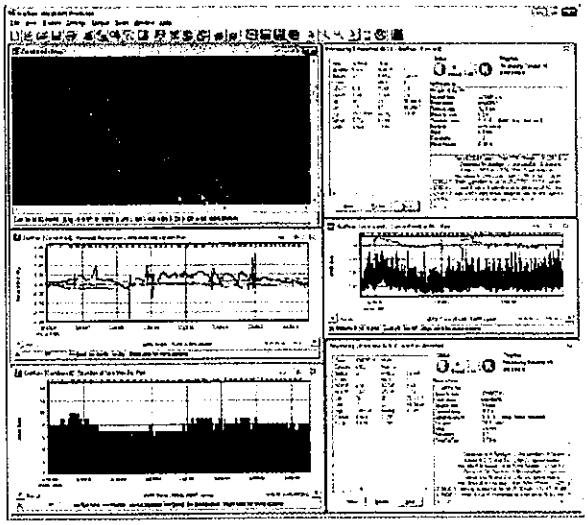
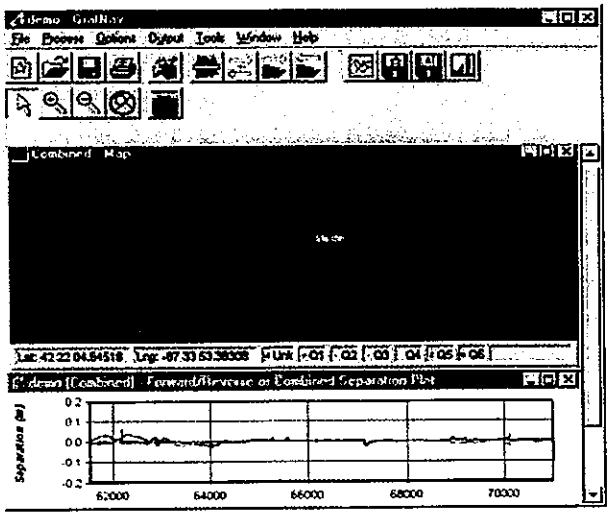
be configured to optimize the GNSS positioning results, even in the most extreme conditions. The software will be configured to makes use of the newly established base station data to achieve centimeter level position accuracy.

A float static solution is available for long and/or noisy baselines. Built-in ionospheric processing improves accuracies for dual-frequency users.

Inertial Explorer Key Features

- Full dual frequency GPS, GLONASS, BeiDou, Galileo and QZSS support within differential processor
- Dual frequency GPS, GLONASS and BeiDou supported in PPP processor
- Support for up to 32 base stations
- Compatible with multiple receiver manufacturers for maximum flexibility
- Static and kinematic processing
- Improved accuracy through forward and reverse processing
- Heading determination between two fixed antennae on the same moving vehicle
- Moving baseline processing: relative positioning and velocity between two kinematic antennas





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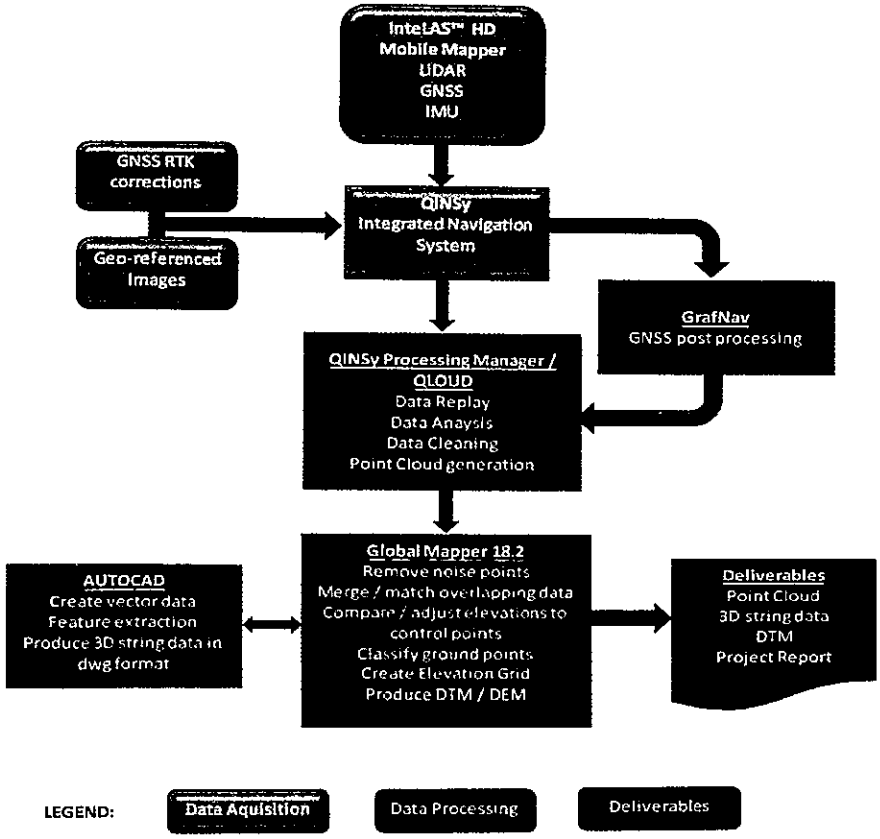

Once the GNSS positioning data has been post-processed, the new vehicle trajectory will be loaded back into the data acquisition software and the LiDAR data will be replayed. This will produce a new accurate post-processed point cloud data set. The point cloud will then be cleaned. The LIDAR data acquisition and GNSS post-processing workflow is shown in the diagram below.

2.5. Project Deliverables

- Station Descriptions of the Survey Benchmarks used (if applicable)
- Cleaned and registered 3D Point Cloud in in .LAS, .LAZ or .XYZ format
- Geo-Referenced Images of the survey route
- Accuracy within 0.1 to 0.2 foot

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- Extracted Features in AutoCAD format
  - Approximate ROW Boundary
  - Building Face
  - Tree Wells
  - Site Furnishings (including lighting, trash, planters)
  - Surface Utilities
  - Spot Elevations

3. PRICES

3.1.	**Mobilization / Demobilization of Vehicle, Equipment & Personnel**	
	LiDAR vehicle preparation and system calibration	**$ 2,500.00**
3.2.	**LiDAR Data and geo-referenced Imagery Acquisition**	
	LiDAR data and Hi-Resolution video acquisition	**$ 10,000.00**
3.3.	**GNSS & IMU Post-Processing and Feature Extraction**	
	Data Post Processing, Cleaning and Feature Extraction	**$ 12,500.00**
	TOTAL COST	**$ 25,000.00**

4. COMMERCIAL TERMS

A Purchase Order from Client must be executed prior to the mobilization of the survey equipment and personnel.

Should you require any clarifications or additional information relating to this proposal, please do not hesitate to contact the undersigned directly.

Sincerely,

Stephen C. Blaskey
High Tide Land Surveying, LLC
RPLS 5856

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5. EXAMPLES OF SIMILAR LiDAR SURVEYS

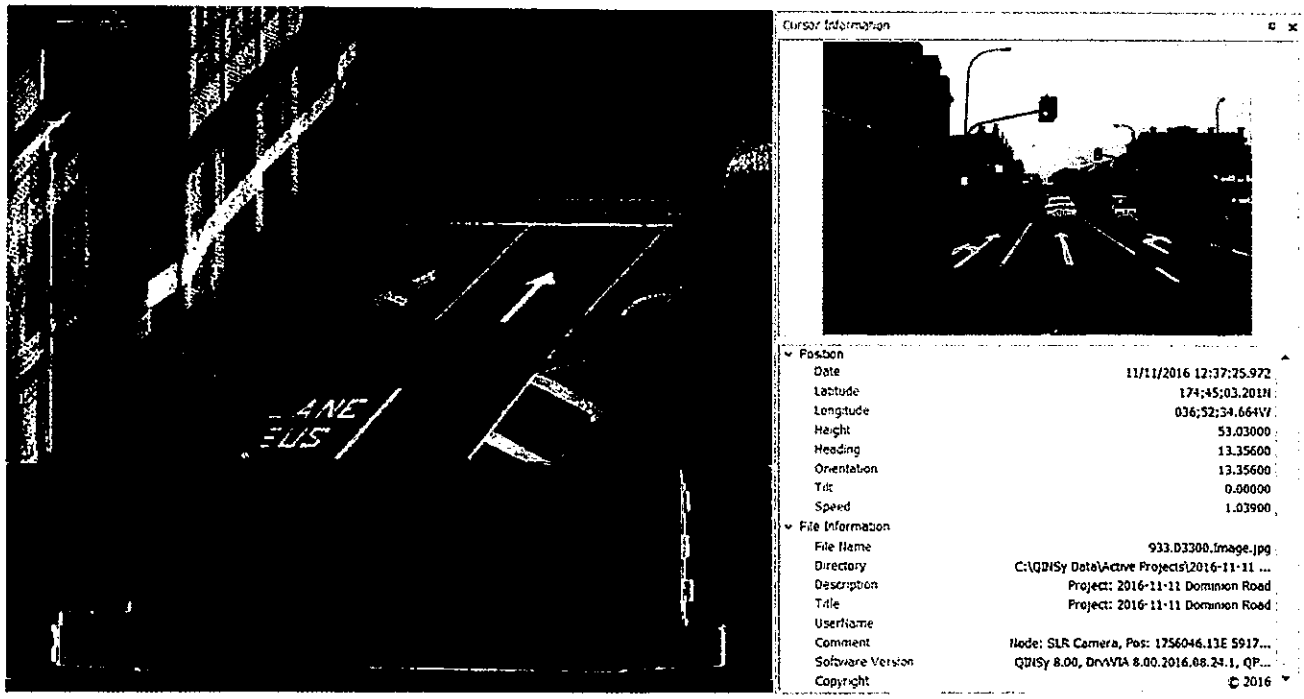

Figure 1 – LiDAR Data with corresponding Geo-Referenced Image

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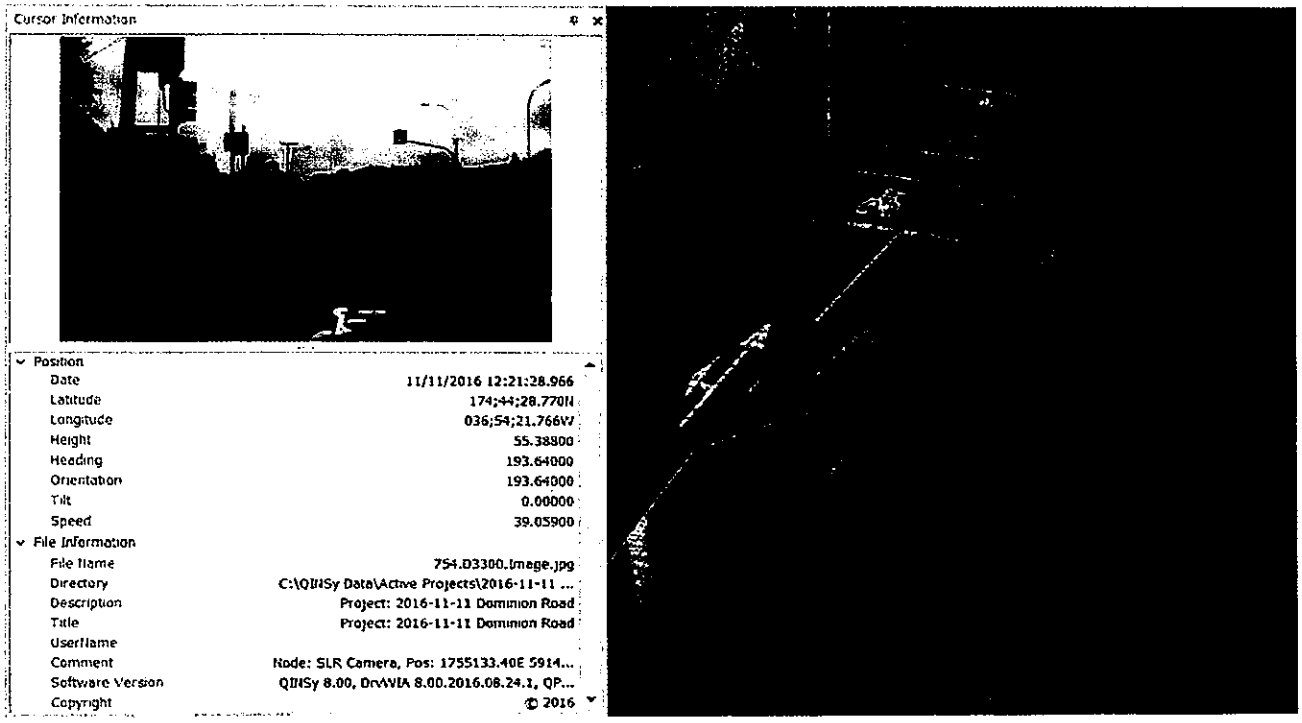

Figure 2 – LiDAR Data with corresponding Geo-Referenced Image

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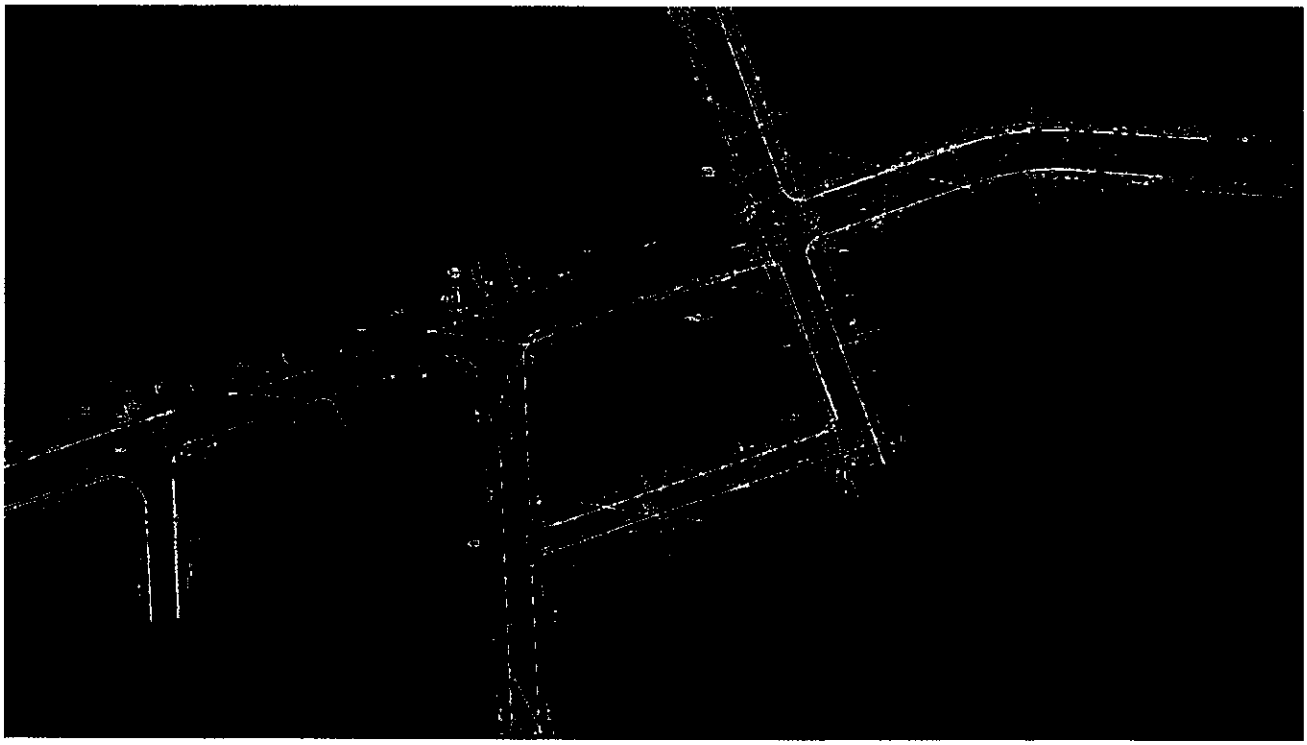

Figure 3 – Feature Extraction Example