How the Second-Fastest Growing City in the U.S. Became “Street Smart”

Greg Brown, GISP, CPM
GIS Manager, City of New Braunfels
The Problem
Pavement Management Problems

- Non-mobile solution that required paper documents by field crews
  - Non-standardized note cards and paper forms were submitted
  - Assistant City Engineer spent three weeks entering the paper documents
  - After data entry the function to update the scores took hours to execute and crashed frequently

- Non-map centric legacy Access database
  - New roads could not be created internally but required the vendor to add the new assets
  - GIS integration required table exports to an ArcGIS environment where parent and child keys were created
  - GIS QA/QC queries were created to identify errors as such null scores or disconnect streets where the vendor had to correct

- Multiple editors were not supported
- Project scenarios could not be created
- Reports could not be created
The Solution
Pavement Management Solution

- Cartegraph was selected to implement their OMS solution
  - Map centric solution
  - Fully functional work order management system
  - Minimal staff resource to maintain
  - Esri product integration
  - Device agnostic
- DTS was selected to scan the roads to produce accurate initial rating scores
  - Scanned roads output was easily integrated in OMS
OMS Functionality

- ArcGIS Online Integration
- User friendly interface
- Requests
- Work Tasks
- Work Orders
- Resources
- YourGov
- Reports
- Minimal staff to maintain
GIS Integration

- Map Updates are synchronized with OMS via ArcMap or OMS Administration using REST endpoint
- Data extraction using ArcPy
- Extracted feature classes consumed by web apps and Dashboard for

```python
print("Truncating wbMainGeneral in SDE...")
if arcpy.Exists(geoPublicWorks_wbMainGeneral):
    arcpy.TruncateTable_management(geoPublicWorks_wbMainGeneral)
print("*** Truncating Tables Complete ***")

def appendDef():
    print("Appending wbMainGeneral_Inspections staging feature class to SDE feature class...")
    arcpy.Append_management(paveMainGeneralInspections, geoPublicWorks_paveMainGeneral_Inspections, "NO_TEST", ",", ",")
    print("Appending wbTaskMainGeneral staging feature class to SDE feature class...")
    arcpy.Append_management(taskMainGeneral, geoPublicWorks_taskMainGeneral, "NO_TEST", ",", ",")
    print("Appending wbMainGeneral staging feature class to SDE feature class...")
    arcpy.Append_management(taskMainGeneral, geoPublicWorks_taskMainGeneral, "NO_TEST", ",", ",")
    print("Appending wbMainGeneral staging feature class to SDE feature class...")
    arcpy.Append_management(taskMainGeneral, geoPublicWorks_taskMainGeneral, "NO_TEST", ",", ",")
    print("Appending Complete ***")

def paveMainGenInsPtsDef():
    print("Deleting paveMainGeneral_Inspections_Pt from staging...")
    if arcpy.Exists(paveMainGeneralInspections_Pt):
        arcpy.Delete_management(paveMainGeneralInspections_Pt)
    print("Converting paveMain lines to points in staging...")
    if arcpy.Exists(paveMainGeneral_Inspections_Pt):
        arcpy.FeatureToPoint_management(paveMainGeneralInspections, paveMaingeneralInspections_Pt, "INSIDE")
    print("Truncating paveMainGeneral_Inspections_Pt in production...")
    if arcpy.Exists(geoPublicWorks_paveMainGeneral_Inspections_Pt):
        arcpy.TruncateTable_management(geoPublicWorks_paveMainGeneral_Inspections_Pt)
    print("Appending paveMainGeneral_Inspections_Pt from staging to production...")
    if arcpy.Exists(paveMainGeneral_Inspections_Pt) and arcpy.Exists(geoPublicWorks_paveMainGeneral_Inspections_Pt):
        arcpy.Append_management(paveMainGeneral_Inspections_Pt, geoPublicWorks_paveMainGeneral_Inspections_Pt, "NO_TEST", ",", ",")
    print("**** paveMainGeneral_Inspections_Pt Update Complete ****")
    if __name__ == '__main__':
        paveMainDef()
        paveInspsDef()
        paveMainInspsPrepDef()
```
ArcGIS Online Web App Builder
Pavement Management Dashboard

3898 Assets
347.54 mi
347.53517779

38 Requests

9078 Tasks
1107 Open
$1,056,689.36
$116.40
New Streets Maintenance Status
Results

- Assistant City Engineer now spends no time with data entry
- Street crews use iPads to complete tasks and work orders. No more non-standardized paper forms
- Public Works Administration can generate easily created custom reports or choose from many canned reports in OMS
- Public Works Administration can create different project scenarios to describe the final results of pavement tasks to City Admin and Council
- Legacy Access database has been replaced with SQL Server
  - No more annual new asset updates by the vendor by instantaneous updates with OMS
Future Plans

• Expand asset integration to include:
  - Signs and Supports
  - Drainage
  - Street Markings
  - Parks

• Incorporate the assets with the Office of Emergency Management (OEM)
  - Extract OMS assets to an ArcGIS environment
  - Generate post/recovery tasks in OMS to record asset replacement values and worker hours to report to FEMA for reimbursements
How the Second-Fastest Growing City in the U.S. Became “Street Smart”

Greg Brown, GISP, CPM
GIS Manager, City of New Braunfels