GEORGIA SMART
Enabling Resiliency and Sustainability through Academic Research and Public Sector Collaboration

City of Woodstock
2019-2020 Class
Final Report
9/3/20

Social Media Tag
#GeorgiaSmart
PROJECT OVERVIEW (YEAR 1)

Smart Woodstock Citywide Strategy
• A planning document to set overarching goals & vision
• Objective: Answer the question “What are we trying to achieve by becoming a Smart City?”

Smart Woodstock Downtown Corridor Study
• A more specific planning document with an identified study area
• Outlines issues in the corridor and recommends specific technical solutions
• Objective: Readiness to put technology on the ground in year 2

Study Area: Main Street, Arnold Mill Road, and Towne Lake Parkway, and the busiest intersection in town where they converge
The need to balance pedestrian comfort & safety with vehicular efficiency & commuter throughput in a booming walkable urban center.

**Downtown Activity:** It is estimated that over 100,000 people attended events in DT in 2018. Amphitheater, Farmer’s Markets, Scarecrow Invasion, Friday Night Live

**Commuter Traffic:** Main Street has 18,400 vehicles per day and Arnold Mill Road has 12,700 vehicles per day.
Dec 2019 & Jan 2020
Visioning and public engagement for the strategy

Jan – Mar 2020
Creation and completion of the strategy

April 2020
Main corridor study work

May 2020
Corridor study recommendations complete

Summer 2020
Ga Tech Intern on staff for research and next steps
PUBLIC ENGAGEMENT

Citywide Strategy Survey

- Project-defining question: When it comes to smart technology, which potential benefits are most important to you?

- 469 total responses
  - 95 in-person Intercept Interview sessions
  - 374 online survey responses

Potential SMART Technology Benefits

- Crime prevention and monitoring
- Improve vehicle, pedestrian, and bicycle safety
- Environmental benefits
- Cost savings and fiscal responsibility
- Improve transparency in government
- Infrastructure monitoring
- Potential return on investment
- Opportunity to create economic development
- Technology that won’t become obsolete quickly
- Improve transportation travel times

What is SMART technology?
The definition of SMART technology is broad and in many ways still emerging, but in general refers to the use of technology that collects and uses data to autonomously improve efficiency, reduce waste, and operate in a more sustainable manner.
Results from the Citywide Strategy Survey

469 Responses

Graphic produced by Pond
Downtown Corridor Study Survey

• This longer survey included multiple choice questions related to demographics and how people move to and through Downtown and a map component

• Mapping feature with commenting and ability to vote on comments is popular, currently 162 comments, not including up and down voting on comments

• Survey publicized with small sticker-flyers

• Please visit smartwoodstock.com or wdstk.ga/smart to access the final map comments
MORE COMMUNITY ENGAGEMENT!

181 initial pins
836 additional up/down votes
1,107 total comments
VIRTUAL TOURS & PANEL DISCUSSION
# Shortlisting Initiatives

**March 6, 2020 Work Session**

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Average Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve vehicle, pedestrian, and bicycle safety</td>
<td>3.0</td>
</tr>
<tr>
<td>Improve transportation travel times</td>
<td>5.0</td>
</tr>
<tr>
<td>Crime prevention and monitoring</td>
<td>3.0</td>
</tr>
<tr>
<td>Opportunity to create economic development</td>
<td>6.0</td>
</tr>
<tr>
<td>Cost savings and fiscal responsibility</td>
<td>5.8</td>
</tr>
<tr>
<td>Potential return on investment</td>
<td>5.0</td>
</tr>
<tr>
<td>Technology that won’t become obsolete quickly</td>
<td>6.6</td>
</tr>
<tr>
<td>Improve transparency in government</td>
<td>5.6</td>
</tr>
<tr>
<td>Environmental benefits</td>
<td>5.0</td>
</tr>
<tr>
<td>Infrastructure monitoring</td>
<td>7.1</td>
</tr>
</tbody>
</table>

**Number of Responses**
- 10
- 25
- 50
- 75
- 100

**Score Allotment**

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Score</th>
<th>Differential from 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve vehicle, pedestrian, and bicycle safety</td>
<td>7.7</td>
<td>4.2</td>
</tr>
<tr>
<td>Improve transportation travel times</td>
<td>7.5</td>
<td>4.2</td>
</tr>
<tr>
<td>Crime prevention and monitoring</td>
<td>7.5</td>
<td>4.2</td>
</tr>
<tr>
<td>Opportunity to create economic development</td>
<td>7.5</td>
<td>4.2</td>
</tr>
<tr>
<td>Cost savings and fiscal responsibility</td>
<td>7.0</td>
<td>4.2</td>
</tr>
<tr>
<td>Potential return on investment</td>
<td>7.0</td>
<td>4.2</td>
</tr>
<tr>
<td>Technology that won’t become obsolete quickly</td>
<td>7.0</td>
<td>4.2</td>
</tr>
<tr>
<td>Improve transparency in government</td>
<td>7.5</td>
<td>4.2</td>
</tr>
<tr>
<td>Environmental benefits</td>
<td>7.5</td>
<td>4.2</td>
</tr>
<tr>
<td>Infrastructure monitoring</td>
<td>7.0</td>
<td>4.2</td>
</tr>
</tbody>
</table>

**Preliminary Score**

- Average Survey Rank (as of 2/18/20)
- Score Allotment (Differential from 10)
- Average Rank

**Project Types**

- **Average Survey Rank:**
  - 3: 5
  - 5: 5
  - 7: 5
  - 9: 5
  - 11: 5
  - 13: 5
  - 15: 5
  - 17: 5
  - 19: 5
  - 21: 5
  - 23: 5
  - 25: 5
  - 27: 5
  - 29: 5
  - 31: 5
  - 33: 5
  - 35: 5
  - 37: 5
  - 39: 5
  - 41: 5
  - 43: 5
  - 45: 5
  - 47: 5
  - 49: 5
  - 51: 5
  - 53: 5
  - 55: 5

- **Score Allotment (Differential from 10):**
  - 0: 0
  - 2: 2
  - 4: 4
  - 6: 6
  - 8: 8
  - 10: 10

- **Average Rank:**
  - 3: 3.0
  - 5: 5.0
  - 7: 7.0
  - 9: 9.0
  - 11: 11.0
  - 13: 13.0
  - 15: 15.0
  - 17: 17.0
  - 19: 19.0
  - 21: 21.0
  - 23: 23.0
  - 25: 25.0
  - 27: 27.0
  - 29: 29.0
  - 31: 31.0
  - 33: 33.0
  - 35: 35.0
  - 37: 37.0
  - 39: 39.0
  - 41: 41.0
  - 43: 43.0
  - 45: 45.0
  - 47: 47.0
  - 49: 49.0
  - 51: 51.0
  - 53: 53.0
  - 55: 55.0
CITY WIDE STRATEGIES

Prioritization Process

Each project was evaluated based on the seven performance themes. Each theme was weighted based on community and city staff input.
Each project was evaluated based on the seven performance themes. Each theme was weighted based on community and city staff input.
Illuminated Sidewalks

Description

The in-pavement illuminated sidewalks and crosswalks are embedded with lighting systems that are oriented towards oncoming traffic and to provide a lit walking path for pedestrians and notify drivers that pedestrians are in the crosswalk.
Real-time parking availability apps serve to inform drivers of available parking spaces based on street-level sensors that detect when a space becomes available. This may also be broadcasted using dynamic signage at the entrance to a parking lot or parking deck to show how many spaces are available. Can be integrated into existing app platforms.
Curb/Lane flexibility is all about repurposing the parking and/or travel lane. Space for parking cars along the curbs could be transformed into a multi-use space that is adjustable based on a city’s needs and goals. Usage can even change throughout the day; a loading zone in the afternoon (including micro-delivery), and a ride share drop-off space at night in an entertainment district. This is best paired with curbside occupancy sensors.

Description

Curb/Lane flexibility is all about repurposing the parking and/or travel lane. Space for parking cars along the curbs could be transformed into a multi-use space that is adjustable based on a city’s needs and goals. Usage can even change throughout the day; a loading zone in the afternoon (including micro-delivery), and a ride share drop-off space at night in an entertainment district. This is best paired with curbside occupancy sensors.
Downtown parking inventory

- 960 + parking spaces
- Spatially distributed across downtown
- Lots of street parking
- No parking decks
- Free parking
- Congestion caused due to visitors looping around to find parking
- Long term parking in prime spaces
- Lack of parking space rotation
- Lack of parking availability info
Parking Availability

Downtown parking on a weekday (Wed) reaches its peak in the evening hours.

Downtown parking on a Saturday remains busy throughout the day.
Parking Availability

Fixed Camera

Image Store

Zone training data

Image Recognition / Object detection Tier

Occupancy Database Tier

Parking Space Envelopes (perspective view)

Network of signs

Parking Availability

Chambers St 300 ft
Chatt. Tech 1000 ft

FULL
AVAILABLE
View Overlooking Parking Lots
Approach to parking lots from 4 different directions

Deep Learning Methodologies:
R-CNN (Region - Convolutional Neural Network), Fast R-CNN, Faster R-CNN
R-FCN (R- Fully Convolutional Neural Network), YOLO (You Only Look Once), SSD (Single Shot Detector)

Computer vision based occupancy determination for Parking Spaces

Available  |  Occupied
Data Governance and Management

- Design Woodstock citizen-centric data governance and management charter – City departments, advisory council, private entities, external experts, and citizens.
- Adopt a responsive, scalable, and agile governance and management model for smart city needs now and far into the future.
- Negotiate with service providers to retain ownership of city data assets.
- Invest in solutions that are open, interoperable, and not tied to specific proprietary formats.
- Develop protocols for data ownership, storage, access control, open data, and interoperability.
CHALLENGES & LESSONS LEARNED

• **Challenge:** The nebulous nature of this project because it is a plan rather than a pilot project creates confusion with how to move forward and makes determining concrete roles difficult for the different entities involved - who can do what and to what extent?

• **Challenge:** Time constraints for city staff who have other full time duties. Smaller cities have fewer employees

• **Lesson:** Identify our internal subject matter experts earlier. For us it’s the Directors of Economic Development, Public Works, and Community Development. Creating a sub-committee or smaller project team with these vital people made for faster decision-making.

• **Lesson:** We need a recommended internal infrastructure for city operations to support whatever is going to happen; we need to plan for the staff and technological resources needed to be able to push this project forward.
100% PUBLIC-DRIVEN APPROACH

• We took 3 months to conduct face-to-face interviews at city events, farmers markets, coffee shops, and around our Downtown Corridor – a new input format for our City!
  • Received over 90 responses and had many in-depth conversations with the general public about where our focus for Smart Woodstock should be.

• Offered an online survey tool for those we couldn’t reach in person – this format allowed for not only survey feedback, but specific map-based feedback on specific problem areas in town.
  • We were able to use these map-based results to create heat maps of the most popular issues, which helped drive our decision making even further.

• ENGAGED OUR LOCAL ELECTED LEADERSHIP
  • Involved our Mayor, Council, Planning Commission, and State Representatives – support from these individuals is crucial to support any new city objectives, especially Smart Technology.
PILOT-SPECIFIC PUBLIC INPUT MEETINGS
- Holding more in-depth public input meetings about specific pilot projects will help us be sure that we’re implementing solutions that the public supports

ADDING SMART STRATEGIES TO EXISTING LONG-TERM PLANS
- Like our 10-year Transportation Plan, Comprehensive Plan, and the new LCI Update Plan we are about to start this fall

SHOWING PROGRESS PROVIDING SOLUTIONS TO POPULAR PROBLEMS
- Our public is very vocal about issues in Downtown Woodstock revolving around parking availability and pedestrian accessibility/safety – we’re looking forward to showing them that we’re trying to solve these issues in the best way possible.
WHAT'S NEXT

YEAR ONE
- Visioning & Goal Setting
- Community Engagement
- Research & Data Collection
- Strategy Recommendations
- Focused Corridor Study
- Specific Tech Recommendations

YEAR TWO
- Pilot Project Programming
- Community Engagement
- Bids & Purchasing
- Implementation
- Evaluation

YEAR THREE
- Ongoing Pilot Projects & Experiments
- Creation of 5-Year Work Plan
- Installation of Permanent Solutions
- Smart Corridor Ready
FUTURE FUNDING

• **LOCAL OPTIONS FOR FUTURE FUNDING INCLUDE:**
  • The City’s General Fund - Particularly the IRWL project could be piloted at one intersection for less than $20,000 and both the Mayor and City Manager over Public Works have expressed interest in self-funding this technology at one crosswalk
  • Livable Centers Initiative project grant funding
  • SPLOST (Special Purpose Local Option Sales Tax) Funds

• **STATE FUNDING OPTIONS INCLUDE:**
  • TAP (Transportation Alternative Program) from GDOT/FHWA
  • LMIG (Local Maintenance and Improvement Grant) from GDOT

• **FEDERAL FUNDING OPTIONS INCLUDE:**
  • Programs financed from the FAST (Fixing America’s Surface Transportation) Act
Project Team Contact Information

Community Lead:
Katie O’Connor, AICP, 770-592-6000, ext. 1601, koconnor@woodstockga.gov

Consultant Lead:
Eric Lusher, AICP, LusherE@pondco.com

GT Researcher:
Ramachandra Sivakumar, siva@design.gatech.edu