Assignment M2:
CS6750 Summer 2021

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Abstract—In this assignment, I will introduce a tool that is very relevant to my community. The tool is called DwellingLive, which is used by residents to pre-register their guests. Without a pre-registration in DwellingLive, the gate officer has to call the resident for a verbal authorization while the visitor's car is waiting in the visitor lane blocking other visitors approaching the gate. The concept of this tool is very straight forward, the interface is very simple, and most importantly it has a high impact to my community, that's why I think it's a good project to work on even though it isn't a popular tool known to many people.

1 PROBLEM SPACE

The problem is some residents don't use the DwellingLive tool often enough, as a result, many calls have to be made by the gate officer every day, which has caused the visitor lane backed up, and sometimes even causes the visiting cars overflow into the resident's lane, which blocks residents from entering the gate. The tool has two user interfaces, website and app. The app is a lot easier to use than the website, especially with the faster login authentication method via facial recognition or fingerprint. This project will focus on the app features more.

2 NEEDFINDING EXECUTION 1: SURVEY

2.1 How it's executed?

The survey was created at https://surveyplanet.com/, and the link was sent via the HOA community email to the entire community (roughly close to 1000 residents). 109 residents completed the survey within a week.

2.2 What's the raw result summary?

Here is the summary of all survey questions and results. On average, how often do you open DwellingLive (either app or website) in a month? 88% of participants

answered less than 10 uses a month. Everything considered, are you satisfied with DwellingLive tool (either app or website)? 68% of responses were either satisfied or very satisfied, and 15% of responses were either unsatisfied or very unsatisfied. On average, how many calls do you receive a call from the security gate in a month? 91% of participants had less than 10 calls, and 6 participants had over 20 calls. Are you aware of the monthly guard call limit of 20 per household? 94% of responses showed the full awareness of the call limit. In the past 3 months, was your access to the residence lane at the gate blocked by cars in the visitor lane? 63% of responses showed the experience of slow clearance. The full survey results are attached in Appendix 8.1.

2.3 What are the takeaways?

Although the people who are satisfied are outnumbered the people who aren't satisfied almost 5:1, clearly the tool can be improved to increase the satisfaction level. The gate blockage issue has affected 63% of survey respondents, which is the main issue to be resolved.

2.4 What are the concretes steps you took to control for the biases?

First, the survey was sent to all residents that have email registered with HOA, which essentially is almost 100% resident coverage. Second, the survey follows the principle of "less is more", and only 5 questions are asked in the survey. This will allow residents to finish the survey in less than a minute. Finally, 3 out of 5 questions are given the feedback/option option, which gives the opportunity to receive additional written information that's not defined by the standard options.

3 NEEDFINDING EXECUTION 2: INTERVIEW

3.1 How it's executed?

Two types of interviews were conducted. The first type was done in a group formed by 4 members of the HOA security committee. A special topic of DwellingLive review was introduced during the committee meeting. The second type was done during the resident training. It was a smaller group of 2 residents. The interview was done after the training was provided. Both interviews lasted about 15-20 minutes.

3.2 What's the raw result summary?

All interviewees used the tool App because it's more convenient than the website. Most of interviewees weren't aware that multiple users could be created in the tool. One interviewee complained that the gate officer still called the resident even after the guest was pre-registered by the resident. This means there isn't an easy name matching capability in the tool. One interviewee mentioned the feature of issuing the guest pass via email or text message. However, this feature is only available in the web, not in the App. Some residents hesitated to mark a guest as "permanent" unless the guest is a relative or a good friend. All interviewee liked the app more than the website, however one resident said he couldn't login for a long period until he reinstalled the app. He used an Android phone.

3.3 What are the takeaways?

The App has a few feature gaps. Issuing the guest pass via email and text should be available in the App. The tool doesn't allow any fuzzy matching or quick search capability, so the gate officer has to eyeball the guest entries to find a match. Also there are a few knowledge gaps. Most residents don't know how to setup multiple users, how to use the "permanent" guest feature. The IOS app is a lot more stable than the Android app, but reinstallation of the app seems a good resolution for the instability issue.

3.4 What are the concretes steps you took to control for the biases?

The interview questions were designed to collect the concrete facts, not opinions. The virtual meeting was conducted so that we can see each other via camera to make sure we can see each other's user experience. Finally, the interview group size (2 people and 4 people) was small to avoid the social desirability.

4 NEEDFINDING EXECUTION 3: EVALUATION

4.1 How it's executed?

One evaluation session was conducted within the security committee of 4 residents. During the evaluation, I specifically asked each participant to open the App, and conduct the evaluation when I asked the questions based on the evaluation script. The total evaluation time was about 30 minutes.

4.2 What's the raw result summary?

All participants can login without using password, which means the login step is fast within a few seconds. Different feedbacks were received on the home screen. 2 residents said the home screen was easy to navigate. 1 resident said the font on the screen was too small. Then 1 resident said the home screen was confusing because he had to think about what to do next on the home scree. On the Contact List screen, everyone can find the "Create New Guest" button almost immediately, but also all of the users were confused by the purpose of the contact list below the button. Nobody used the contact list feature. The Guest Form was the easiest step, no one had any questions on what to do on this scree. But no one knew if there were any fields optional, 1 resident said he filled out all fields, which took more time than he liked. See Figure 1 for the 3 screens on the app.
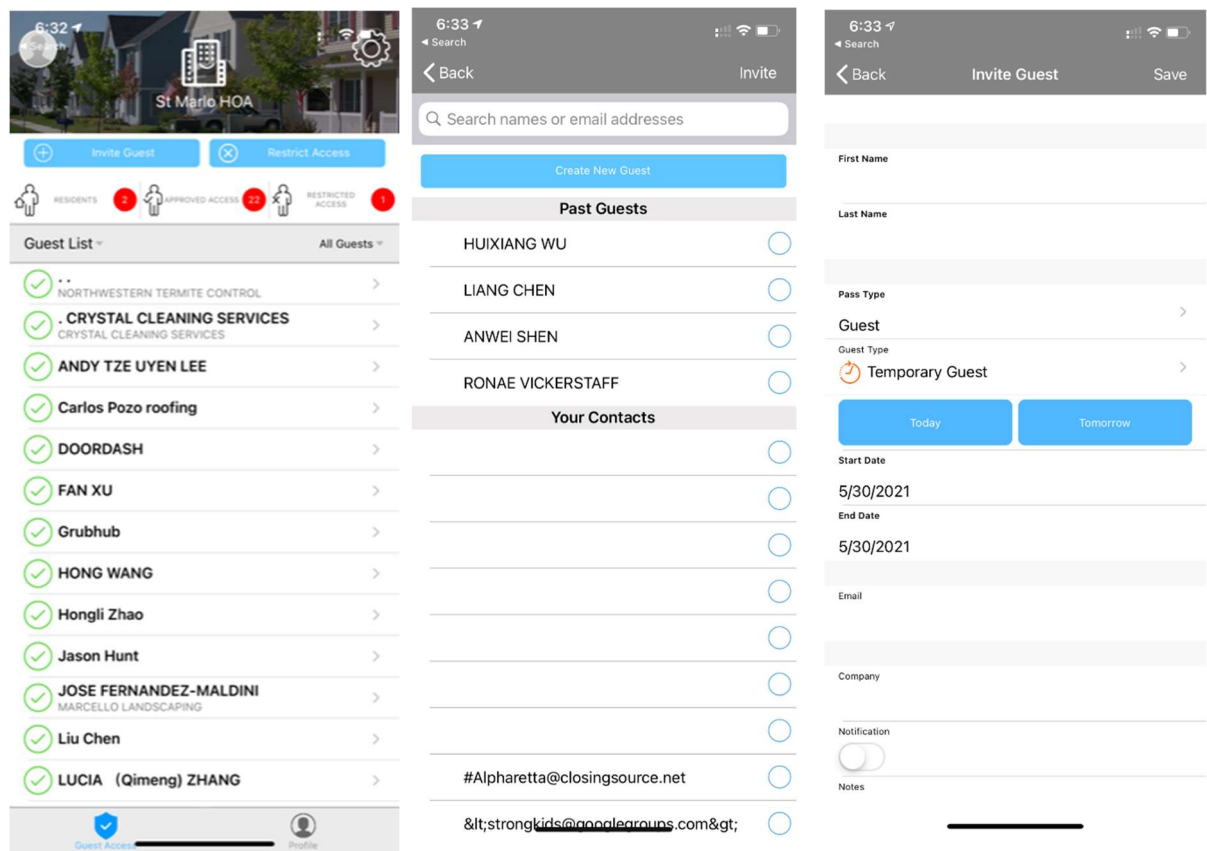

Figure 1—   DwellingLive App: Home
Screen, 'Create New Guest' Screen, 'Invite Guest' Screen

4.3 What are the takeaways?

All of the screens are either confusing or take more time than necessary for a user to perform the guest registration task. A few redesign ideas were popped out during evaluation, for example, removing less useful information, making the key action more prominent, and highlighting the required fields.

4.4 What are the concretes steps you took to control for the biases?

The biases were controlled by focusing the evaluation questions on facts. The speed of each action was measured via a timer. Then more how and what type of questions were asked to find out deeper feedback than just simple Yes or No.

5 DATA INVENTORY

5.1 Needfinding 1: Survey

Who are the users?	The survey asked the users how often they used the tool. Most respondents were relatively frequent users.
Where are the users?	This wasn't asked in the survey.
What is the context of the task?	This question wasn't asked explicitly. It's implied that the user can complete the task at any time anywhere.
What are their goals?	Some residents gave feedback on tool features, and some felt the tool was difficult to use. Their goals are to use less time for them to create a guest entry, and their guests can pass through the gate quickly.
What do they need?	Some residents didn't know essential tool features, and they need the tool training.
What are their tasks?	Their task is to complete guest registration.
What are their subtasks?	Subtasks depend on the interfaces. Some users use the website, and some used the app. The app user subtasks include opening the phone, finding the app, login, getting to the registration form, filling the guest form, and submitting.

5.2 Needfinding 2: Interview

Who are the users?	There were 2 sets of users. The first set users used the tool frequently, and the second set users needed some training on the tool.
Where are the users?	This wasn't asked in the survey.
What is the context of the task?	This question wasn't asked explicitly. It's implied that the user can complete the task at any time anywhere.
What are their goals?	The goals for the first set users are to use less time for them to create a guest entry, and their guests can pass through the gate quickly. The goal for the 2nd set is simply to learn how to use the tool.
What do they need?	The 2nd set of users attended the tool training session, so clearly they need the tool training.
What are their tasks?	Their task is to complete guest registration.
What are their sub-tasks?	All users are app users. Subtasks are opening the phone, finding the app, login, getting to the registration form, filling the guest form, and submitting.

5.3 Needfinding 3: Evaluation

Who are the users?	The users are frequent users of the tool. However, they only use the tool in certain ways that they used to.
Where are the users?	This wasn't asked in the survey.
What is the context of the task?	This question wasn't asked explicitly. It's implied that the user can complete the task at any time anywhere.
What are their goals?	Their goals are to use less time for them to create a guest entry, and their guests can pass through the gate quickly.
What do they need?	They need a faster way to complete guest registration.

What are their tasks?	Their task is to complete guest registration.
What are their sub-tasks?	All users are app users. Subtasks are opening the phone, finding the app, login, getting to the registration form, filling the guest form, and submitting.

5.4 What you should have done differently

The questions of "Where are the users" and "What is the context of the task" should have been asked during all 3 needfinding exercises. Answers to those questions might bring out why residents don't use the tool more often. The tool might be something they can use at anytime and anywhere. By asking those questions, the needfinding exercises might discover additional requirements and areas for improvements.

6 DEFINING REQUIREMENTS

Most users have been using the tool for a while, the requirements will focus on efficiency improvements.

6.1 Requirements

The tool should provide a user interface that allows users to register a guest quickly. It should gather essential guest information for the purpose of identity verification. The interface should be intuitive so that the users can learn by themselves and no special training is required. The app should be available on both iOS and Android, and only residents who have a valid account can access the tool. The enhancements to the tool should be easy to implement to keep the cost low.

6.2 Success Metrics

The overall goal is to improve the guest registration speed. There are two metrics to measure the speed. How fast can a user get to the guest registration form page? It includes subtasks of opening the phone, finding the app, login, and getting to the registration form. The second measurement is how fast a user can fill in the guest form. It includes subtasks of form filling, verification, and submission.

7 CONTINUED NEEDFINDING

7.1 What remaining questions

Two remaining questions are "Where are the users" and "What is the context of the task". Those questions could help me discover additional requirements and areas for improvements.

7.2 What new questions

A new set of the users should have been considered. The gate officers use the tool to pull the guest registration information and screen the guest. They may have a different user interface, but they are the other side of the same coin. Unless they can process the guest registration information correctly and quickly, it will still be difficult to achieve the ultimate goal of speeding up the guest gate access. I need to find out what their tasks are, what the context, and what they need.

7.3 What types of exercises

I'll add a new needfinding exercise and perform naturalistic observations on gate officers to find out how they use the tool on their end. I'll conduct additional interviews and evaluations on the tool. The remaining questions will be asked along with more feature specific questions.

8 APPENDICES

8.1 Survey Report
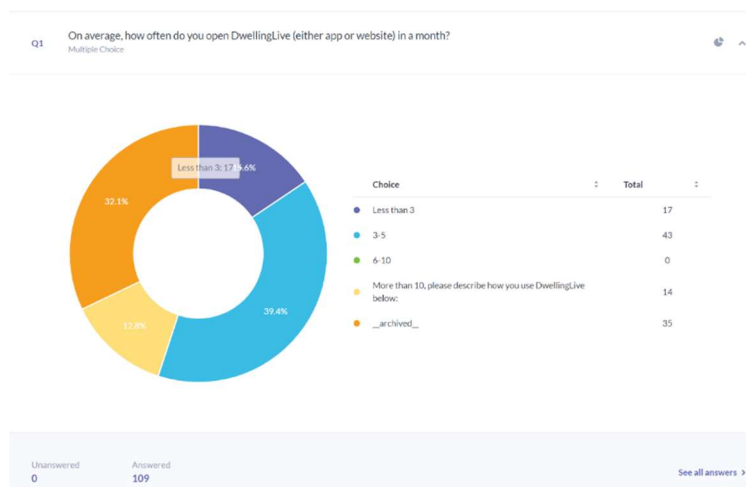
Q2 Everything considered, are you satisfied with DwellingLive tool (either app or website)?
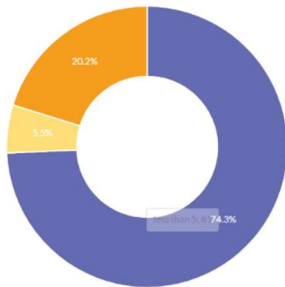Rating
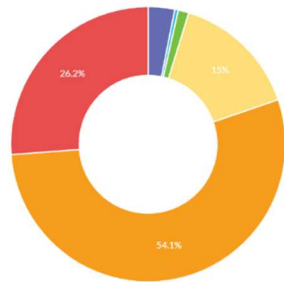
Choice	Rating	Total
1 - Very Unsatisfied	15	15
2 - Unsatisfied	2	1
3 - Somewhat Unsatisfied	6	2
4 - Somewhat Satisfied	72	18
5 - Satisfied	260	52
6 - Very Satisfied	126	21

Unanswered	Answered	Average Rating	
0	109	4 - Somewhat Satisfied	See all answers >

Q3 On average, how many calls do you receive a call from the security gate in a month?
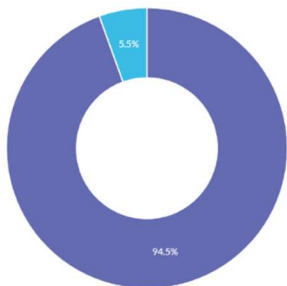Multiple Choice

Choice	Total
less than 5	81
6-10	0
11-20	0
More than 20, please explain any difficulty in using DwellingLive below:	6
__archived__	22

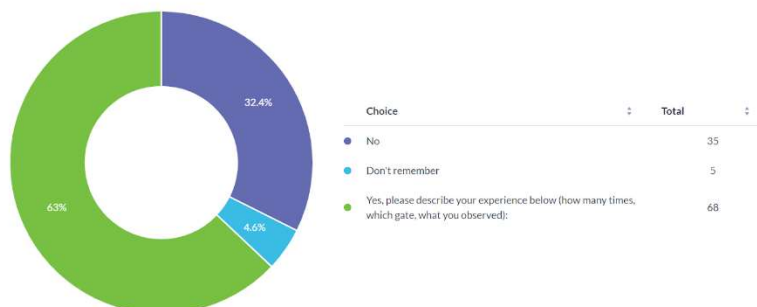| Unanswered	Answered	
0	109	See all answers >

Q4 Are you aware of the monthly guard call limit of 20 per household? If the household exceeds the limit for the first time, training will be required. If a household repeatedly exceeds the limit, the...
Multiple Choice

Choice	Total
Yes	103
No	6

Unanswered	Answered	
0	109	See all answers >

Q5 In the past 3 months, was your access to the residence lane at the gate blocked by cars in the visitor lane?
Multiple Choice

Choice		Total
● No		35
● Don't remember		5
● Yes, please describe your experience below (how many times, which gate, what you observed):		68

Yes, please describe your experience below (how many times, which gate, what you observed):: I've sat thru 3 lights on Old Atlanta waiting to turn left into the neighborhood--I live on that side of the neighborhood so it's pretty inconvenient
Yes, please describe your experience below (how many times, which gate, what you observed):: Back gate
Yes, please describe your experience below (how many times, which gate, what you observed):: The back gate is blocked often in the am,but it's not a long wait and they do a good job of trying to get everyone in quickly
Yes, please describe your experience below (how many times, which gate, what you observed):: a few times,back gate
Yes, please describe your experience below (how many times, which gate, what you observed):: Several times at front gate
Yes, please describe your experience below (how many times, which gate, what you observed):: Rear gate blocked by long line of cars and once by a non resident
Yes, please describe your experience below (how many times, which gate, what you observed):: maybe once or twice car got in wrong lane or scanner wasn't working properly
Yes, please describe your experience below (how many times, which gate, what you observed):: Back Gate: most of the time is backed up, waiting at light for a long time.

Yes, please describe your experience below (how many times, which gate, what you observed):: Big trucks or cars overflowing from visitor side
Yes, please describe your experience below (how many times, which gate, what you observed):: Back gate - delay in aditting non-residents, primarily service companies, make a left turn from Old Alabama Road very slow.
Yes, please describe your experience below (how many times, which gate, what you observed):: On the back gate due to backup of the visitor lane I Was not able to make the left turn from old Atlanta road.
Yes, please describe your experience below (how many times, which gate, what you observed):: Back gate....really a dangerous situation
Yes, please describe your experience below (how many times, which gate, what you observed):: Me and my family, several times, and sometimes stuck out on the main road waiting to turn in!
Yes, please describe your experience below (how many times, which gate, what you observed):: Morning and Afternoon at the Back Gate more
Yes, please describe your experience below (how many times, which gate, what you observed):: Twice at the back gate I have had to pull out into the 'straight' lane to go around visitors. Twice at the front gate I have had to wait at the light, unable to pass visitors for entry.
Yes, please describe your experience below (how many times, which gate, what you observed):: Old Atlanta entry may need a deeper (for more waiting vehicles) access area
Yes, please describe your experience below (how many times, which gate, what you observed):: Today 2021-04-28, while coming through the rear gate around 1:20 pm, a Massey's truck was sitting at the security gate. The line went out into the street.
Yes, please describe your experience below (how many times, which gate, what you observed):: delivery car was waiting on resident's area
Yes, please describe your experience below (how many times, which gate, what you observed):: Sometimes there are long lines at the back gate which also block the turn at the intersection. This causes significant delay for residents to enter.

Yes, please describe your experience below (how many times, which gate, what you observed):: Yes - both gates - very dangerous! Probably a total of 5 occasions

Yes, please describe your experience below (how many times, which gate, what you observed):: Front gate- two times the line was backed up to where I could not turn into the subdivision at all from the light

Yes, please describe your experience below (how many times, which gate, what you observed):: several times, front gate, too many vehicles in visitor lane.

Yes, please describe your experience below (how many times, which gate, what you observed):: Back gate

Yes, please describe your experience below (how many times, which gate, what you observed):: A few times at the front gate. Quite the conga line of cars. I also see delivery vehicles lined up when they should be using the back gate only.

Yes, please describe your experience below (how many times, which gate, what you observed):: Back gate - several times due to commercial business vehicles

Yes, please describe your experience below (how many times, which gate, what you observed):: very often during weekends

Yes, please describe your experience below (how many times, which gate, what you observed):: About once a week, back gate backed up at various times of the day. For each lengthy back up you have to wait for the traffic light to change signals further delaying arrival to your home

Yes, please describe your experience below (how many times, which gate, what you observed):: Back gate--Cars making left turn into guest lane were backed up onto Old Atlanta, and cars making right turn into guest lane were backed up onto Old Atlanta, making it impossible for any resident to gain entry to resident lane.

Yes, please describe your experience below (how many times, which gate, what you observed):: Trucks - both gates- twice at back gate and once at front gate. Waited it out until the trucks got out of the way on two occasions. On the other occasion, the guard let us go through the visitor side because it was taking a long time.

Yes, please describe your experience below (how many times, which gate, what you observed):: A few times, mostly during the day at the back gate

Yes, please describe your experience below (how many times, which gate, what you observed):: Back gate, a few times/month during the day. Not a big issue

Yes, please describe your experience below (how many times, which gate, what you observed):: Twice, back gate. Could not turn left towards the neighborhood due to visitors.

Yes, please describe your experience below (how many times, which gate, what you observed):: The Friday of the garage sale the front gate was blocked turning in from McGinnis Ferry. I had to wait through a couple of light cycles

Yes, please describe your experience below (how many times, which gate, what you observed):: Back gate is often stacked up with vehicles and vendors trying to get in. Just this morning I had to leave the turning lane to go around all the cars waiting in line to try and get to the resident lane. Sort of dangerous.

Yes, please describe your experience below (how many times, which gate, what you observed):: Old Atlanta Road gate

Yes, please describe your experience below (how many times, which gate, what you observed):: 3 times, the back gate trying to turn left from McGinnis Ferry. I observed a number of work trucks that took most of the guest entrance. Some residence were actually going around left turning traffic because the guest lane was so backed up!

Yes, please describe your experience below (how many times, which gate, what you observed):: twice - front gate - once by a truck that could not fit under the visitors lane and the other by a car. Not sure if it was a resident who couldn't get through or a visitor

Yes, please describe your experience below (how many times, which gate, what you observed):: To many cars in the visitor lane blocking the residence lane

Yes, please describe your experience below (how many times, which gate, what you observed):: At the front gate there is often a long line in the visitor side around lunchtime.

Yes, please describe your experience below (how many times, which gate, what you observed):: This has occurred at the back gate multiple times. It seems that there are times of the day when the back gate is backed up and cars are unable to turn into the lanes causing cars to do some go arounds to get in. In some cases, the light on Old Atlanta cycled 3 times with no movement. If there is a way to move cars to a waiting area when trying to get approval for a car to enter, this will help allow residents in.

Yes, please describe your experience below (how many times, which gate, what you observed):: Both gates. Visitor lane was backed up.

Yes, please describe your experience below (how many times, which gate, what you observed):: Once at the front gate due to many cars at the visitor lane.

Yes, please describe your experience below (how many times, which gate, what you observed):: Back gate especially.... Major problems back there.... It is also very dangerous with cars trying to go around the backed up lane.

Yes, please describe your experience below (how many times, which gate, what you observed):: Front gate several times couldn't turn left into st. Marlo

Yes, please describe your experience below (how many times, which gate, what you observed):: This actually happens weekly at the back gate. If you are turning left into the neighborhood and the visitor line is backed up, it backs up into the turning lane into St Marlo. Also if you are turning right to enter from Old Atlanta and a visitor is in front of you and the visitor lane is full, you again are stuck waiting until it clears.

Yes, please describe your experience below (how many times, which gate, what you observed):

Yes, please describe your experience below (how many times, which gate, what you observed):: back gate

Yes, please describe your experience below (how many times, which gate, what you observed):: Front gate, 3 times, either large truck in the residence lane(1) or cars and small trucks lined out to the street and blocking access to the residence lane.

Yes, please describe your experience below (how many times, which gate, what you observed):: Rear gate. Once.

Yes, please describe your experience below (how many times, which gate, what you observed):: At least twice at the front gate for a long time 10 min at least and at the back gate once for 15 min

Yes, please describe your experience below (how many times, which gate, what you observed):: Several times. Mostly at back gate. Once at front. Guard processing of visitors is SLOW.

Yes, please describe your experience below (how many times, which gate, what you observed):: Back gate. It's mostly blocked because the visitor lane line is so long that we cannot access the resident lane. There are other times that a visitor goes in the resident lane and holds everything up, but that is more like once a month.

Yes, please describe your experience below (how many times, which gate, what you observed):: Back gate is always backed up in the am

Yes, please describe your experience below (how many times, which gate, what you observed):: Atleast once a week at the backgate

Yes, please describe your experience below (how many times, which gate, what you observed):: Mostly the back gate. Approximately 10 times. Front gate twice.

Yes, please describe your experience below (how many times, which gate, what you observed):: back gate coming from laurel springs direction in the morning around 9:15-9:30ish, I couldn't turn right as visitor lane backed up and visitors/contractors had nowhere to go except sit in turn lane

Yes, please describe your experience below (how many times, which gate, what you observed):: Can't make left turn from Old Atlanta into resident's lane

Yes, please describe your experience below (how many times, which gate, what you observed):: It was the back gate. The line stretched back to the street and there were additional guests (I'm assuming) in the left turn lane from Old Atlanta Rd. I simply went around that line and made the left into the resident lane.

Yes, please describe your experience below (how many times, which gate, what you observed):: Many times, it happen vey often at back gate in the morning

Yes, please describe your experience below (how many times, which gate, what you observed):: Back gate. Just once.

Yes, please describe your experience below (how many times, which gate, what you observed):: Front gate; many cars backed up trying to gain access