The Center for Resilient Cities and Landscapes (CRCL) uses planning and design to help communities and ecosystems adapt to the pressure of urbanization, inequality, and climate uncertainty.

Through interdisciplinary research, visualization of risk, project design scenarios, and facilitated convenings, CRCL works with public, nonprofit, and academic partners to deliver practical and forward-thinking technical assistance that advances project implementation. Through academic programming, CRCL integrates resilience thinking into design education, bringing real-world challenges into the classroom to train future generations of design leaders.

Founded at the Columbia University Graduate School of Architecture, Planning and Preservation in 2018 with a grant from The Rockefeller Foundation, CRCL extends Columbia’s leadership in climate-related work and support of the interdisciplinary collaborations and external partnerships needed to engage the most serious and challenging issues of our time. Allied with the Earth Institute’s Climate Adaptation Initiative, CRCL works across the disciplines at Columbia by bridging design with science and policy with the goal of improving the adaptive capacity of people and places.

100 Resilient Cities - Pioneered by The Rockefeller Foundation (100RC) is dedicated to helping cities around the world become more resilient to the physical, social, and economic challenges that are a growing part of the 21st century.

100RC supports the adoption and incorporation of a view of resilience that includes not just the shocks, such as earthquakes, fires, floods, but also the stresses that weaken the fabric of a city on a day-to-day or cyclical basis.

CONTRIBUTORS

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100 Resilient Cities: Sam Carter (Director of Resilience Accelerator), Femke Gubbels (Program Manager)
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The Hague has an opportunity to more effectively plan transportation infrastructure that learns from past mistakes, anticipates future trends, builds a coalition across fields, and brings multiple benefits to its residents by studying how transportation projects are conceived, planned, implemented, used, and monitored.
The Leyenburg Corridor presents an opportunity for The Hague to demonstrate the ability of transit-oriented development to integrate a broad range of long-term objectives, such as strengthening social cohesion at the neighborhood scale, catalyzing urban densification, increasing public investment, giving access to economic opportunities, and increasing the efficiency and accessibility of health resources.

A transportation infrastructure project in The Hague will contribute to urban resilience by addressing the challenges of shifting populations, poverty, and exclusion throughout the planning process.

Den Haag Centraal, The Hague’s central transit hub, provides access to all three of the city’s passenger train systems: The state-wide Nederlandse Spoorwegen (NS), the city trams, and the Rotterdam Metro Erasmuslijn, which provides commuter access to the Hague’s nearest metropolitan neighbor and points in between.

Centraal was a fitting place for us to start our visit to The Hague, where we met with civil servants and stakeholders to discuss the city’s nascent plans to build a new rail line—the tentatively named Leyenburg Corridor. This line would connect the city center to The Hague Southwest, a cluster of peripheral neighborhoods in the Escamp district that are targeted for new housing development in the coming decades.

The Leyenburg Corridor project is still in an early planning phase, so it presents an opportunity to demonstrate how transportation projects can address the types of shocks and stresses that are prevalent in The Hague Southwest, such as social incohesion and limited access to private investment, employment opportunities, and health resources.

We participated in tours, conversations, presentations, workshops, and interviews over three densely-programmed days in The Hague. We learned about the city’s municipal transit system, social life in Southwest and Escamp, the district’s history, its multicultural population, and the services and opportunities that are available to it—and those that are absent.

During the 2018 fall semester, graduate students in the Columbia University Urban Planning program conducted research on precedent transit projects around the world and investigated ways in which transportation planning can contribute to urban resilience. In each case, students considered the purposes for which precedent projects were conceived and constructed; the political and institutional context in which they were developed; how planning decisions were made; and the standards by which they were evaluated. The students then analyzed these case studies for lessons that may be applied to similar transportation projects in the future.

A companion report contains the research for our partners in The Hague as examples of transportation planning processes that may inspire further ideas for the planning and implementation of the Leyenburg Corridor.
<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
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| September, 2018 | Site Visits  
                  Accelerator Workshop  
                  Interviews with Academic Partners |
| October, 2018 | Workshop Report Delivery                       |
| November, 2018 | Student Case Study Research                    |
| December, 2018 | Student Case Study Presentations               |
| January, 2019 | Case Study Report Delivery                     |

Dymphna Faas, Sam Carter, and Mirjam van der Knaats on their way to a site visit
SITE VISIT

On Monday, September 10, 2018 we made 12 stops on a tour of the Escamp district and its four Southwest neighborhoods. At each stop, we were met by city officials, neighborhood activists, residents, or institutional representatives who discussed their work with us. Cumulatively, these conversations outlined a portrait of the area, its physical and social makeup, its history, and some of the ideas proposed for its future.

Sites and meetings, in order of visitation:

- Den Haag Centraal
  Klaske Hermans, Program Advisor, Municipality of The Hague

- District Office of Escamp at Leyweg
  Rene Baron, City Director of Escamp District

- District History
  Albert Olierook, Area Director Escamp

- Sportcampus Zuiderpark

- Marcustuin Neighborhood Garden
  Bettelies Westerbeek, Missionary Pioneer, Moerwijk

- Activities Centre Jan Luykenlaan
  Denise Rifaela, Public Safety Professional, and others

- House Vestia
  Rob Voogt, Manager of Social Management, Vestia

- Primary School
  Fatima Aarab, Active Mothers Group

- Neighborhood Room/Tolerance Program
  El Hoesne, Representative, Mosque Annour, and Ben Damen, Tolerance Platform

- Green Oasis
  Nander Krapels, Community Builder, Stichting Mooi

- Made in Moerwijk
  Peter Verstappen

- Resto van Harte
  Ben Lachab, Restaurant Manager

---

Den Haag Centraal
Klaske Hermans

The Hague’s Central Station (Den Haag Centraal) supports three rail systems: the regional and state-run Nederlandse Spoorwegen (NS) service, the city-wide tram service, and the Rotterdam Metro’s Erasmuslijn (the E line), which serves commuter stops between the two cities. When the Erasmuslijn was extended to Den Haag Centraal in 2011, nearby residents felt that the construction was disruptive to their neighborhood. They successfully leveraged their concerns to negotiate for the redesign of a nearby park.

Lesson: The Leyenburg Corridor may similarly disrupt neighborhood life in Escamp. The Hague should create opportunities for Southwest neighborhood groups to participate in planning conversations and negotiate for desired amenities.
District Office of Escamp
Rene Baron and Albert Olierook

The Southwest is emblematic of some of The Hague’s most acute social stresses. Poverty rates are high, as is distrust of the government and social isolation. Employment and education opportunities are scarce. These stresses were compounded by decreased public investment during the economic downturn in the late 2000s.

Escamp is the largest and poorest of The Hague’s eight districts, and its four Southwest neighborhoods are among the most disadvantaged and ethnically diverse in the Netherlands. These neighborhoods were built in the 1950s to house middle-class Dutch residents in the wake of World War II. They have since been settled by immigrant communities from former Dutch colonies, the Middle East, Eastern Europe, and elsewhere. The neighborhoods’ population declined sharply in the 1980s, as ethnically Dutch residents moved to newly-built suburbs. The physical and social infrastructures have since fallen into disrepair despite a period of renewed investment in the area during the 1990s and early 2000s.

Lesson: A resilience plan should be mindful of the possibility of abrupt or gradual political, economic, and social change.
Marcustuin Neighborhood Garden
Bettelies Westerbeek

Pastor Bettelies Westerbeek is one of many community leaders in Southwest who can facilitate communication between residents and civil service organizations. Westerbeek manages the Marcustuin Neighborhood Garden; when she was appointed to her church in the Moerwijk neighborhood in 2016, she asked nearby residents to suggest programs for a vacant lot adjacent to its building. With the help of local volunteers, she built a public garden with individual lots and a communal herb garden. Westerbeek holds a gathering every Sunday, where dozens of neighbors cook together using the garden’s pizza oven.

Lesson: Community leaders can facilitate communication between residents and institutions, which is needed to prevent new infrastructure from exacerbating, rather than mitigating, existing stresses.
Vestia House

Rob Voojis

The Hague wants the Leyenburg Corridor to support new housing, including subsidized and market-rate units. Southwest’s post-war housing complexes were designed for small Dutch families in the 1950s, and are now inadequate for late-century population changes and larger immigrant families. Many of the current residents require social services, such as mental health services, that are not easily accessible. Vestia, the largest public housing corporation in the Netherlands, operates the vast majority of subsidized housing in the area. Slated for demolition, the mid-century complex we toured will soon be replaced by a new building, similarly designed but with one additional floor.

Lesson: A new model for urban development should accommodate future economic, demographic, and social change.

Primary School

Fatima Aarab

Once children graduate from elementary school in the Southwest, there are few resources for them in their neighborhoods. The students are bused to high schools outside of the Southwest, where they sometimes cause minor mischief or commit acts of vandalism. To address these issues, a group of student mothers maintain open communication with school officials and local police. The relationships between these groups has, by all accounts, been cooperative.

Lesson: The Hague can use the Leyenburg Corridor to make educational opportunities more accessible to Southwest families. Denser neighborhoods may be able to support new high schools, and the corridor can decrease commutes to nearby colleges and vocational schools. Because the new corridor would not be completed for 20 years, The Hague must consider how education and employment needs may change in coming generation and plan the corridor route to be flexible to such uncertainties.
The Tolerance Platform works with local religious institutions, like El Hoesne’s mosque, to organize interfaith programs that celebrate the traditions of Escamp’s diverse population.

Lesson: Individual and communal isolation are major stresses in Southwest. While there are many programs in Escamp that address these, the programs are not always able to reach the populations they try to support. New transportation infrastructure should not only enable the creation of new services, but also strengthen existing ones.

The Green Oasis is an access point for many public resources. Escamp residents can arrive without an appointment and be connected with service providers.

Lesson: The Green Oasis is an important resource for the Southwest, but it is not easy for most residents to reach. As The Hague plans new transportation infrastructure, it should consider establishing similar service centers in coordination with transportation routes.
Made in Moerwijk
Peter Verstappen

Restro van Harte brings Southwest residents together with community activists and civil servants to share meals and encourage communication among neighbors. The traveling pop-up restaurant is open once or twice each week, usually in a community center or other public space with a kitchen. Volunteers, including professional chef Ben Lachab, cook and serve meals.

Lesson: As with the Green Oasis, organizations like Restro van Harte must be easily accessible to be effective. Transportation corridors can strengthen such institutions if nearby development plans create spaces for them to operate.
Construction of the Leyenburg Corridor, with a stop in Zuid West District, presents a set of challenges that can be informed by past and ongoing major transportation projects. How can we build transportation infrastructure that maximizes the benefit to those who need it most, minimizes harm to the environment, is robust to the future stresses and shocks of the 21st century, and most of all, sets a framework for sustainable, equitable and resilient growth for our cities?

This workshop served as a starting point for a research program conducted by the Columbia University Center for Resilient Cities and Landscapes and 100 Resilient Cities. The workshop objective was to clearly identify the most pressing research questions to apply to both the Leyenburg Corridor and comparable precedents around the world.

**WORKSHOP AGENDA**

**September 11, 2018**

Time | Activity | Location
--- | --- | ---
9:00 – 9:30 | Welcome and Introductions | Anne-Marie Hitipeuw
9:30 – 9:45 | Overview of Resilience Accelerator program and scope of research with the Hague | Thad Pawlowski and Sam Carter
9:45 – 10:00 | Update on the Hague's Resilience Strategy | Anne-Marie Hitipeuw
10:00-10:15 | Zuid-West site visit observations | Gideon Finck
10:15 – 10:45 | Long Term vision for neighborhood | Marije Stelloo
10:45-11:15 | Exercise 1: Mapping the Hague’s future shocks and stresses to Zuid West. | Break into two tables with Sam, Thad, and Gideon facilitating.
11:15 – 11:30 | Leyenburg Corridor Proposal | David van Keulen/
11:30-12:30 | Exercise 2: Defining potential impacts of project (positive and negative) at multiple scales | Breakout tables
12:30 – 1:00 | Lunch | Breakout tables
2:30 – 3:30 | Overview of precedent case studies
3:30 – 3:45 | Exercise 3: Resilient Implementation
3:45 – 5:00 | Exercise 4: Resilient Outcomes
1:00 – 1:30 | 7-line extension to Hudson Yards
1:30 – 2:30 | Breakout tables
2:30 – 3:30 | Miami-Dade SMART plan
3:30 – 3:45 | Bus Rapid Transit system in Curitiba,
3:45 – 5:00 | Metrocable in Medellin
4:45 – 5:00 | Break

*Indicate specific geographies of risk and opportunity on neighborhood map and shocks and stresses matrix*

**Time** | **Activity** | **Location**
--- | --- | ---
2:30 – 3:30 | Overview of precedent case studies | Thad Pawlowski and Gideon Finck
3:30 – 3:45 | Exercise 3: Resilient Implementation | Breakout tables
3:45 – 5:00 | Exercise 4: Resilient Outcomes | Breakout tables

*What are some measurable outcomes that could be tracked as the project is implemented?*

*How do these outcomes relate to the underlying shocks and stresses of the neighborhood?*

*What other factors that may influence the success of the project?*

*Break*

*Synthesis of research questions and Next Steps*

*Thad and Sam to facilitate*
Resilient The Hague and 100 Resilient Cities invited representatives from municipal government, policy advisors, and subject-matter experts from universities and non-profit organizations to participate in the Accelerator Workshop. The group included civil servants from municipal planning and transportation departments with knowledge of The Hague’s development plans, as well as its political and regulatory environments. Participants also included representatives from the Escamp district office, some of whom work closely with neighborhood groups.

**Participants:**
- Rene Baron
  City Department Director Escamp, The Hague
- Christine Carabain
  Sustainable Society Program Leader, Social and Cultural Planning Office
- Samuel Carter
  Director of the Resilience Accelerator, 100 Resilient Cities
- Serge Eurlings
  Director of Income, Participation and Facilities, The Hague
- Dymphna Faas
  Area Manager City Department Escamp
- Gideon Finck
  Associate Research Scholar, Center for Resilient Cities and Landscapes
- Femke Gubbels
  Program Manager, 100 Resilient Cities
- Anne-Marie Hitipeuw
  Chief Resilience Officer, The Hague
- Thaddeus Pawlowski
  Director, Center for Resilient Cities and Landscapes
- Erik Pruyt
  Associate Professor of System Dynamics and Policy Analysis, TU Delft
- Merijn Schik
  Head of Strategy Unit, The Hague
- Eline van Staalduinen
  Policy Advisor, The Hague
- Marije Stelloo
  Urban Planner, The Hague
- Rene Teule
  Strategy & Research Program Manager, The Hague
- Matthijs de Vries
  Strategy Coordinator, The Hague
- Bob van Meijeren
  Housing Policy Advisor, The Hague
- Thaddeus Pawlowski
  Director, Center for Resilient Cities and Landscapes
- Erik Pruyt
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  Strategy & Research Program Manager, The Hague
- Matthijs de Vries
  Strategy Coordinator, The Hague
- Bob van Meijeren
  Housing Policy Advisor, The Hague

The one-day workshop was held in a pavilion in Zuiderpark, one of two large parks in Escamp.
A proposed master plan for The Hague Southwest argues for as many as 10,000 new housing units and a redesigned neighborhood center on the site of the Leyweg Shopping Center, an aging relic of an early 1990s urban development initiative.

City Planning
Marije Stelloo

Long-term projections show a need for as many as 30,000 new housing units for 70,000 new inhabitants in Escamp, but the precise shape and density of new housing facilities and the phasing of their construction are still a matter of debate. Stelloo presented a few scenarios that would address this need. These included 4,200 new housing units in Southwest neighborhoods in the next 20 years, without major adjustments to infrastructure or amenities; 10,000 new units with a more efficient energy grid, more market-rate housing, renovations in two regional parks, linear corridors between them, five or more new schools, and a larger shopping center.

Transportation consultant Bastiaan Ter Horst explained that 150,000 new daily car movements are anticipated in The Hague by 2040. To reduce that number and decrease travel times, Ter Horst proposed upgrading the existing Koningcorridor, the main rail artery in The Hague, and the Randstad Old Line, which connects the Hague to Leiden and Rotterdam. The Leyenburg Corridor would be part of the same investment initiative. With these improvements, new car trips per day could be reduced to as few as 38,000, carbon emissions could be reduced by 120 million kg per year, and commute times in the Southwest could be reduced by about 30 percent on average. In this plan, the Leyenburg Corridor would terminate at Binckhorst and cost EU$350–500,000,000. Its proposed terminal station could potentially connect to future regional light-rail infrastructure.

A proposed master plan for The Hague Southwest argues for as many as 10,000 new housing units and a redesigned neighborhood center on the site of the Leyweg Shopping Center, an aging relic of an early 1990s urban development initiative.
Precedent Case Studies

Thad Pawlowski, Gideon Finck, and Sam Carter presented five case studies of metropolitan transit projects around the world, and led a conversation about how and why these projects were conceived, planned, implemented, and received.

Case Study 1: Hudson Yards

In 2015, after five years of construction, the New York City Transit Authority completed the extension of the east-west No. 7 subway line, whose western portion bisects midtown Manhattan. The line's western terminus is now at Hudson Yards, a massive new mixed-use development along the Hudson River. Originally proposed as part of a bid for the 2012 Olympics, the subway extension project was pursued despite losing the Olympic bid because the project would nevertheless encourage housing and commercial development on a previously inaccessible and underutilized site. It was funded with a "synthetic TIF," which allowed New York City to leverage future incremental increases in property tax revenue to receive loans for construction.

Lesson: The purpose of a project often changes, but multiple benefits ensure viability.

Case Study Two: Curitiba Bus Rapid Transit

The Rede Integrada de Transporte (RIT), the mass transit system in Curitiba, Brazil, is used by about 85 percent of the municipal population every day. The system’s central feature is its Bus Rapid Transit (BRT) infrastructure, first envisioned in the late 1960s. There are five types of bus lines: Some routes circle the city center in concentric rings and others connect intermediary neighborhoods to major stations. Some buses use designated lanes in a trinary road system that physically separates lanes for buses from car lanes with median strips. The city has more recently introduced “tube stations” where passengers purchase tickets before entering in order to expedite boarding times. The buses are owned and operated by 16 private companies, even though the infrastructure is built, maintained, and regulated by the municipal government (for example, all routes use a single, flat fare system). The system is often considered successful because private automobile usage has declined by about 30 percent since 1974, even as the municipal population doubled. Nevertheless, private automobile ownership remains high, and the city is now considering investing heavily in rail transport to meet the needs of a population that continues to grow.

Lesson: Transit systems serve different roles in a city’s development. A fixed system may require modification over time.
Case Study Three: Medellin Metrocable

Medellin, Colombia has a system of four cable car lines that connect mountainside residential areas to the city’s main commercial district, its central valley. The lines transport about 5,000 passengers apiece in each direction. The first of these lines opened in 2004 and was designed to decrease burdensome commuter times; it was also hoped the line would mitigate high unemployment and crime rates in a high-density residential neighborhood famous for both. The latter three lines were conceived with different purposes in mind: To spur development in a low-density neighborhood, for example, or to promote tourism to a peripheral and relatively inaccessible nature park. Each of these lines was planned and built in under five years. The lines are owned and operated by the municipality and are integrated with other public amenities, such as arts and cultural institutions and programs, which are sometimes privately funded. The Metrocable is wholly integrated with other mass transit systems, most notably the central valley’s pre-existing subway system.

Lesson: A successful transit project design responds to the unique conditions of a place and needs of its users.

Case Study Four: Brightline

Brightline is a new rail link serving the Florida cities of Miami, Fort Lauderdale, and West Palm Beach, with an extension to Orlando underway and an extension to Jacksonville under discussion. It is privately owned and operated by All Aboard Florida, a subsidiary of Florida East Coast Industries. Brightline provides a more comfortable, more expensive, and quicker alternative to Tri Rail, an existing publicly-managed rail line. Part of the Brightline route uses existing Florida East Coast Railway tracks that are shared with freight rail. As Brightline upgrades these tracks, it’s possible that Tri Rail will begin using them as well. In order to extend its reach to Orlando, Brightline hoped to lay new tracks along a public right-of-way along Florida’s Beachline Expressway, but after determining that the space was too narrow, Brightline reached a land deal with adjacent landowners in 2013.

Lesson: Private transportation can serve dynamic public need.
Case Study Five: Access to the Region’s Core (ARC)

The U.S. Federal Transportation Administration granted funding to the state of New Jersey in 2009 to build a new rail tunnel from Newark to Manhattan to supplement an existing 100-year-old tunnel under the Hudson River. The tunnel would be operated and partly funded by the interstate Port Authority of New York and New Jersey, and would serve New Jersey Transit commuter lines. Despite clearing all technical and environmental requirements, and securing all necessary funding, the project was vetoed by New Jersey Governor Chris Christie, who worried that the project would hurt his credibility as a fiscal conservative as he prepared to run for national office.

Lesson: Without a broad base of public support, even the most vital and rational projects are politically vulnerable.
WORKSHOP EXERCISES

Exercise One: Mapping The Hague’s future shocks and stresses to Zuid West.

Exercise Two: Defining potential positive and negative impacts of project at multiple scales.

Exercise Three: Resilient Implementation

Exercise Four: Resilient Outcomes

### Table One
- More stresses than shocks
- Shocks are national/global scale
- Stresses are neighborhood scale
- Focus on neighborhood impacts
- Positive impacts are mostly social, not environmental

### Table Two
- Stresses are neighborhood scale
- Some stresses are physical
- Some stresses are intangible
- Most impacts are social or economic
- Only one environmental impact
- Interest in regional connection to Westland

- Highest interest/impact stakeholders are transportation service providers
- Other stakeholders are neighborhood organizations, national ministries and city agencies
- Regional focus
- Regional stakeholders: Port of Rotterdam, Greenport institutions, trade schools, and provincial and national government.
- Creation of a “resilience district” in The Hague Southwest
- City-wide effort with interdisciplinary project team and community committee
- Develop a resilience vision before implementing a project
- Transportation project can address a broad range of neighborhood goals and facilitate beneficial civic outcomes
RESEARCH QUESTIONS

The participants summarized key emergent issues into a set of questions to guide the Leyenburg Corridor project team.

1. Can transit change perceptions?
2. Can it solve social problems?
3. Who should own the project?
4. How does transit reshape physical and institutional borders?
5. How to define the limits/scale of the project and manage complexity?
6. How do you select station locations (capture and disperse value, pick winners and losers)?
7. How do you define your constituency?
8. What models of cost-benefit analysis or “criteria analysis” can be applied to transit projects? What models can be used to measure the performance of the built project?
INTERVIEWS

In a series of interviews, professors and researchers from The Hague University and TU Delft discussed academic work that could be relevant to Leyenburg Corridor planning. The academics we spoke with study various topics, including ways to involve citizens in urban planning processes, and construction technologies and implementation practices. Some of their research projects can be useful to The Hague as it considers ways to include Southwest residents and neighborhood leaders in the planning of the Leyenburg Corridor.

Following these interviews, we met Peter Hennephof, the Municipal Secretary of The Hague, whose support for an interdisciplinary approach to mass transit in Escamp is essential to the success of the project.

Interview Participants:

Frances Brazier, Professor of Engineering Systems Foundations, and Tina Comes, Associate Professor and Delft Technology Fellow on Designing Resilience at TU Delft

Technological components integrated in physical infrastructure projects to share information and feedback across sectors

Erwin Cardol, Director of the World Horti Center

Future development of horticultural and agricultural tech industries

Peter Hennephof, City Manager of The Hague

Interdisciplinary in early stage planning

Jos van Leeuwen, Professor of Interaction Design, and Arnold Jan Quanjer, Teacher of Interaction Design at The Hague University

Interactive visualizations as tools for community participation in project design

Niek Mouter, Faculty of Technology, Policy and Management, TU Delft

Tools for participatory planning and public engagement during the planning process

Rob Ruts, Quartermaster of Urban Innovation Laboratories at The Hague University

Neighborhood convenings, mapping and storytelling workshops as experiments in inclusive planning

The World Horti Center in Westland is part school, part showroom, and part laboratory dedicated to the study and development of emerging horticultural and agricultural technologies.
Niek Mouter, Faculty of Technology, Policy and Management, TU Delft

Niek Mouter is an economist at the Faculty of Technology, Policy and Management at TU Delft. He is interested in participatory budgeting, specifically how people think differently about personal versus collective spending. Through his research, he found that when it comes to transportation decisions, people are more likely to approve personal spending to save time in transit than public investment to similar ends.

Mouter has developed a tool designed to make government spending more comprehensible to the public. He writes surveys that are mailed to residents who may be affected by a proposed civic project. These explain the scope of the project, its intentions, and costs compared to other civic projects that could be paid for with the same amount of money. Participants are then asked to vote for their preferred options. They are also allowed to “donate” their vote to other people they think are either more qualified or more directly affected by the outcome. The tool has not been used to make binding decisions (nor do participants want it to be used this way), but rather to raise political pressure on public officials and ease communication between government and residents.

Lesson: Participatory planning tools can reveal discrepant priorities and encourage trust.

Jos van Leeuwen and Arnold Jan Quanjer, Professors of Interaction Design, The Hague University

Jos Van Leeuwen and Arnold Jan Quanjer are interested in how virtual reality visualizations and simulations can be used in public engagement processes. According to Klaske Hermans, The Hague requires public engagement during the planning of public projects, but exactly how to engage the public is a matter of discretion. In a recent park upgrade project, Hermans’ office used virtual reality tools to solicit feedback from residents in the park’s vicinity on a few design options for park facilities. After the visualizations were made public, residents were asked to vote for their favorite designs and 1,400 residents responded (out of 11,600 solicited).

Lesson: Visualizations are powerful communication tools that can be used to clarify civic projects.

Rob Ruts, Quartermaster of Urban Innovation Laboratories, The Hague University

Rob Rutz is an activist philosopher, artist, and director of Innolab. At the moment, his primary research is focused on policing, and creating avenues of communication between police and policed. He is interested in conflict resolution and the organized processes that bring communities together. According to Rutz, cities are fundamentally spaces of conflict. Community engagement therefore should enable people to cope with struggle. The term “community,” according to Rutz, should include teachers, employees, civil servants, entrepreneurs, and other local stakeholders, as well as residents. He invites community members to his labs and believes his workshops could provide a resource to Escamp and The Hague to involve a wide range of community members in public projects.

Lesson: Communication should include everyone who shapes civic life, not just residents and civil servants.

Frances Brazier and Tina Comes, Professors of Engineering at TU Delft

Frances Brazier and Tina Comes research public engagement in civic infrastructure projects, and how signage and other modes of communication establish trust between citizens, civic institutions, and government.

Lesson: Effective project planning requires clear communication between stakeholders.

Erwin Cardol, Director of the World Horti Center

The World Horti Center in Westland, the Netherlands houses three integrated institutions: a horticultural/agricultural trade school, a showroom for agricultural technology, and greenhouse laboratories. The institutional focus is not on traditional agricultural production, but on a future-oriented vision of horticulture as biotech. The 1,200 students who study at the Horti Center are local commuters, but agro-tech industries are becoming increasingly global. As horticultural technologies progress, the Netherlands may be poised to lead the world in horticultural knowledge and technological development, if not in agricultural production.

Lesson: Connecting Southwest to schools and jobs in Westland requires anticipating changes in the agricultural industries.

Peter Hennephof, Municipal Secretary of The Hague

Peter Hennephof is interested in examining international case studies to better understand when and how infrastructure projects benefit vulnerable communities, and applying those lessons to The Hague Southwest. To do so, he hypothesizes that an inter-agency task force is necessary to “break the silos” of government. He believes that there is funding and political support available for such projects, as evidenced by large urban development initiatives in Rotterdam. He would like the Center for Resilient Cities and Landscapes and 100 Resilient Cities to convince him and his colleagues of the value of a “resilience approach” to transportation planning by finding examples of coalition efforts in similar projects elsewhere.
SYNTHESIS

Inclusive, forward-looking planning will enable the Leyenburg Corridor to facilitate a more sustainable future for residents of Escamp and the Southwest.

When we toured Escamp and the Southwest, the people we met hardly spoke about transportation. They were eager to talk about a number of other urgent stresses: a lack of health services; loneliness; a bad reputation; segregation; unemployment; domestic problems hidden from public view; and more. Nevertheless, it was understood in the workshop that the planning of the Leyenburg Corridor could shape the future development of the area, from the quantity and type of housing that will be built to the socio-demographic composition of its population.

Two concerns underlie many of the conversations that emerged in the workshop and subsequent interviews with researchers. First, any transportation corridor will not be completed for about 20 years, and the Southwest's current vulnerabilities and opportunities may change by then. This concern was reinforced at the World Horti Center. In the workshop, there was quite a bit of interest in using the Leyenburg Corridor to increase access to Westland, on the basis that a Westland connection would provide employment opportunities for unskilled laborers, thus addressing unemployment in Southwest and demand in Westland. But upon visiting the Horti Center, it became clear that the most important opportunities in Westland 20 years from now may be educational opportunities or training for skilled jobs, rather than unskilled labor. We heard repeatedly that there are no nearby opportunities for Southwest teenagers and young adults to build careers and stay in the area. Bringing the Southwest closer to Westland, to the educational and future career opportunities available in the high-tech horticultural industries of the future, may indeed prove to be an even stronger proposition than previously assumed.

The second concern that came up throughout our visit was that Southwest residents feel marginalized, and there is a perception problem both in and out of the area. This poses a serious risk that any project, however well intended, will be perceived by the Southwest residents as yet another example of the city ignoring their real needs.

Next Steps: Seminar Research

CRCL will compile a report of international transit-oriented development projects. These case studies will be studied by teams of graduate students at Columbia University, who will gather critical research, including primary-source interviews, about the processes by which transit projects have been planned and implemented. For each precedent, students will investigate:

- Why the project was proposed
- How alternatives were (or weren't) considered
- How the public was (or wasn't) engaged in the planning process
- How projects are financed and built in various jurisdictional contexts
- How the relative success of the project has been evaluated

Furthermore, students will choose proposed projects that share some contextual similarities to their precedents, and assess how the lessons learned from built projects can inform the planning process.

Concerns:
- Project length
- Demographic uncertainty
- Economic uncertainty
- Neighborhood perception

Neighborhood stresses:
- Lack of health services
- Unemployment
- Isolation
- Domestic problems

Research outline:

1. Built Project
   - 1.1 Context
     - Facts and figures comparing study area to its regional environment
     - Map of transit environment
   - 1.2 Overview
     - Project location
     - Project extents
     - Summary of project definition, purpose, owner, cost, and timeframe
     - Facilitating environment
     - Project delivery chart
     - Project timeline
   - 1.3 Lessons learned
     - Questions for primary sources
     - Conclusions from interviews

2. Proposed Project
   - 2.1 Context
     - Facts and figures comparing study area to its regional environment
     - Map of transit environment
     - Social/demographic environments
     - Historic changes in study area
     - Shocks and stresses in study area
     - Study area's Adaptive Cycle location
   - 2.2 Overview
     - Project location
     - Project extents
     - Summary of project definition, purpose, owner, cost, and timeframe
     - Facilitating environment
     - Proposed delivery chart
     - Proposed timeline
   - 2.3 Resilience Assessment and Recommendations
     - System resilience
     - Community resilience
     - Ecological resilience
     - Recommendations
CASE STUDY CITIES AND RESEARCH TEAMS

Accra Bus Rapid Transit (BRT)
Darkar BRT
Boyin Li and Jialin Zhai

Amsterdam Metro North-South Line
Copenhagen - Northavn Extension
Savannah Ryder and Etienne d'Anglejan

Boston Fairmount Line
Michael Montilla and William Reis

Dar es Salaam Bus Rapid Transit (DART)
Nairobi Proposed MTS (BRT)
Claire Yang

Guangzhou-Shenzhen-Hong Kong Express Rail Link (GHS Rail Link)
Shanghai-Juxing-Ningbo Express Rail Link (SJN Rail Link)
Zheya Liu and Luyun Shao

Hudson Yards
Brooklyn-Queens Connector
Yue Han and Hana Dunston

Medellin Metrocable and Master Plan
Argelis Gonzalez Samot and Alexandros Balili

Mexico City Metrobus
Guadalajara Light Rail System
Shivani Gahwas

Mombasa-Nairobi Heavy Rail
Savannah Wu and Yuan Gao

Seattle LINK
Denver Light Rail
Da Wu and Junteng Zhao

Tsukuba Express (Japan)
Beijing-Xiongan Express Line (China)
Danting Liu and Shulin Zhang

Washington Dulles Corridor Metrorail
Laguardia AirTrain
Cheryl Lim and Eunhee Son