

Armour Station Office

Arch 449/549 Architectural Programming

Project-4: Energy Program

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Many Metropolitan Areas throughout the United States are rapidly approaching a critical juncture in their development as centers for commerce and trade. Metropolitan Atlanta is one area that's posed for potential doom if regional municipalities and state agencies do not start working together to fix regional issues. Due to the area's large supply of affordable land, places of inhabitant have moved farther and farther away from the centers of employment. As development expanded to the outer suburbs, public transportation was unable to handle this growth because it was minimal and uncoordinated. These factors have lead to increasingly dreadful problem with urban sprawl, pollution, and congestion which has started to affect the quality of life for Atlanta's residents. To overcome the decentralized car-dependent planning traditions of the past, Metro Atlanta must develop a regional multi-modal transit station that will accommodate the Atlanta Regional Commission.

With the expected growth in the region in the next 13 years, the Atlanta Metropolitan area will have to start rethinking the way it handles regional growth and transportation. Inhabitants of the region will require affordable housing near the places where they work or at least have access to public transportation. The public transportation will have to be provided at a scale and efficiently level so that people will prefer to take it rather than drive to work. Communities and neighborhoods will once again have to become pedestrian friendly and have amenities such as stores, schools and parks within walking distance so people don't have to drive. These improvements to the region will require the constituencies work together with the Atlanta Regional Commission to fund and maintain the building and planning of its infrastructure. There is still hope for the Atlanta region but it will take a reversal in the planning policies of sprawl to a high density urban core supported by public transportation.

Due to the fact that the program for my building is primarily office space, the energy consumption for the building will largely occur during the times of 9-5 on Monday-Friday. Since the schedule of the office space is pretty standard, the program can use the assumption that HVAC and lighting will be able to be provided at a minimal level during off hours hence saving energy. The largest energy consumption for the building will be the energy used to cool the building especially during the summer months in Atlanta. In addition to the heat-gain in the summer months from the sun, the building will have a large amount of heat-gain due to the equipment that office buildings require such as, computers, copiers, and task lighting.

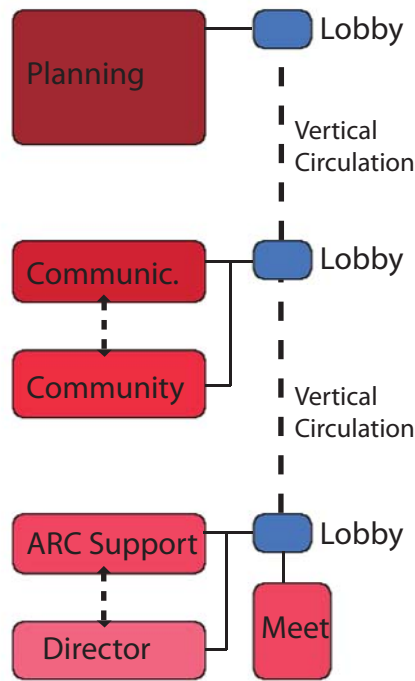
Energy Conservation Strategies:

- Oriented building along east-west axis to provide maximum southern exposure.
- Use open floor plan system to provide daylight to the interior of the office space.
- Translucent wall materials for Private Offices to allow light to infiltrate to the interior.
- Use daylight harvesting systems with dimmers to control light level in office space during day time hours.
- Use Sun Screen on Southern exposure to allow heat-gain during winter months but block it out during summer months.
- Use Double glazed system on Southern exposure to provide stack effect cooling system and separation between outside and inside climate.
- Use of Photovoltaic Panels on Station Canopies as well as building to produce energy on-site
- Operable windows for natural ventilation when outside temperature is appropriate.
- Raise floor system to provide direct user control air to the workstations and offices.

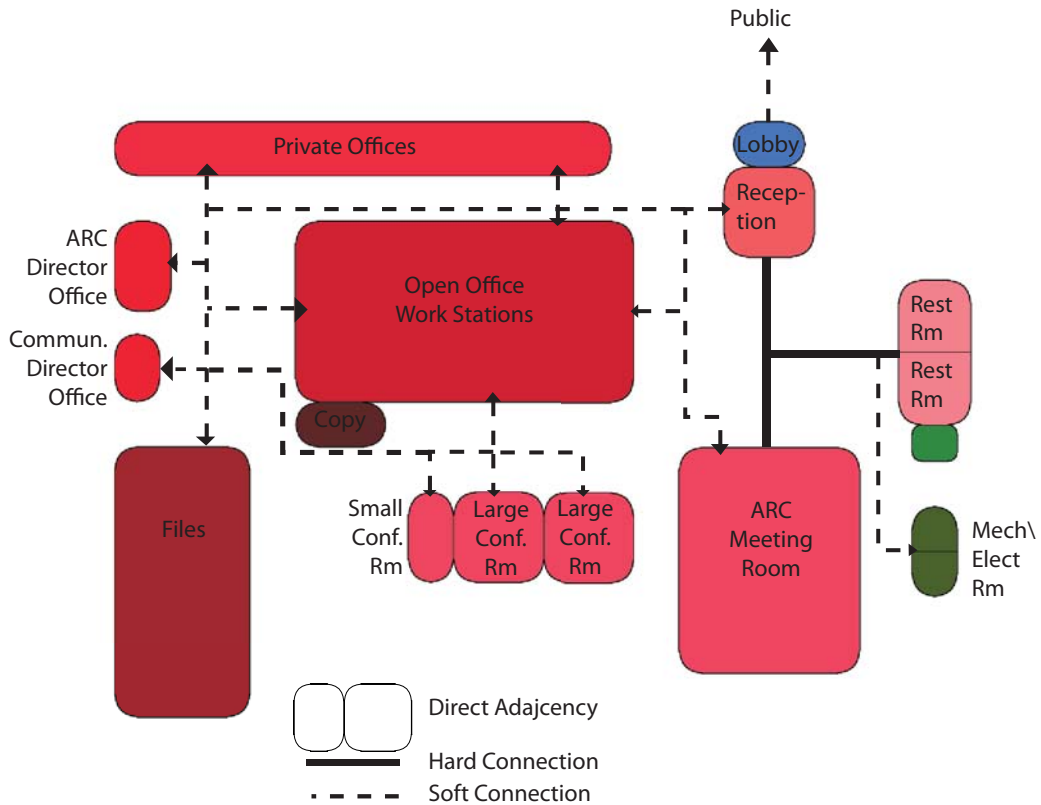
Space	Occupants	Area	Height	Lighting	Temperature Range
ARC Meeting Room	80	2,000 sf	10' at high end 20' at low end	High Ambient / Low Task	High
Lobby	-	160 sf	12'	High Ambient / Med Task	Low
(2) Restrooms	(2) 2	(2) 256 sf	10'	Low Ambient	Low
Open Office Space	30	3000 sf	15'	Low Ambient/ High Task	High
(2) Conference Rooms	(2) 20	(2) 400 sf	12'	High Ambient / Low Task	Med
Conference Room	10	200 sf	12'	High Ambient / Low Task	Med
Director Office	2- Director + Assistant	250 sf	12'	Low Ambient/ High Task	Low
Commun. Director Office	1	150 sf	12'	Low Ambient/ High Task	Low
(11) Private Offices	11	(11) 10' X 12'12'		Low Ambient/ High Task	Low
(2) File Storage	-	(2) 300 sf	9'-6"	High Ambient / Low Task	Low
Copy Room	-	200 sf	9'-6"	Low Ambient /Low Task	Low
Mech / Electrical	-	200 sf	9'-6"	Low Ambient /Low Task	Low
Janitor	-	80 sf	9'-6"	Low Ambient /Low Task	Low

SPACE MATRIX

ARC OFFICE SPACE

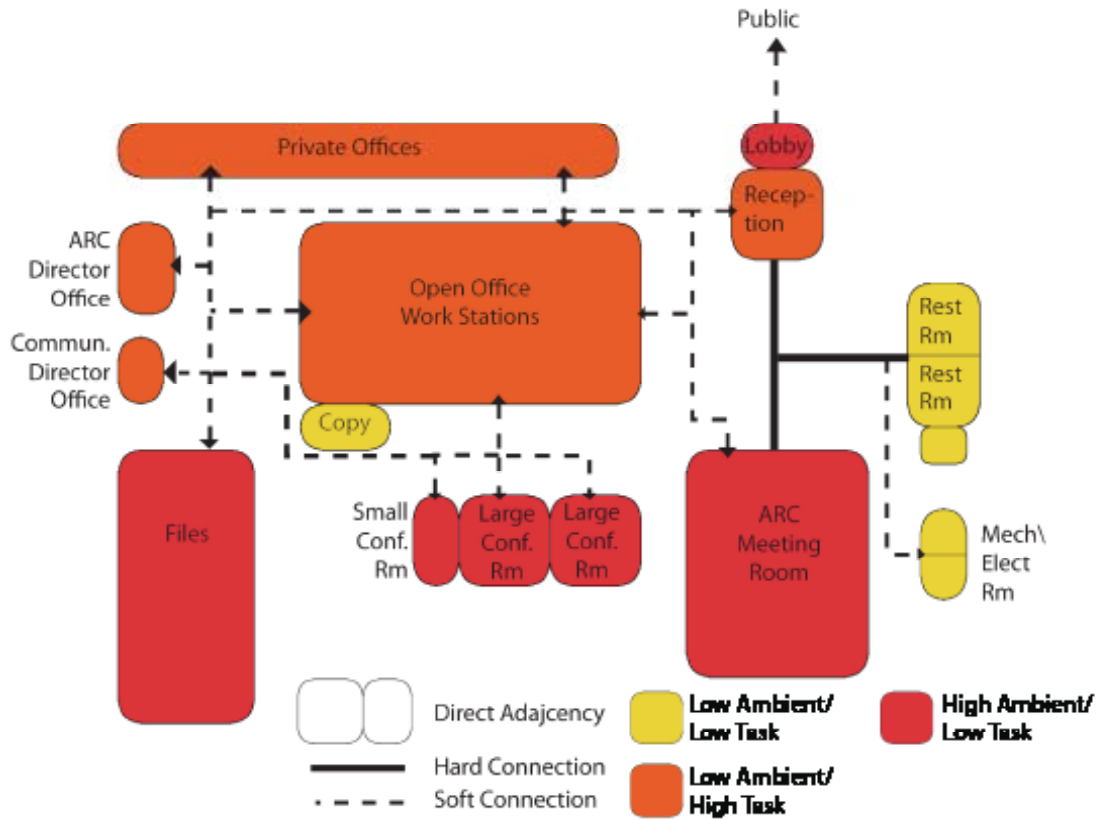


1ST LEVEL OF ARC OFFICE SPACE

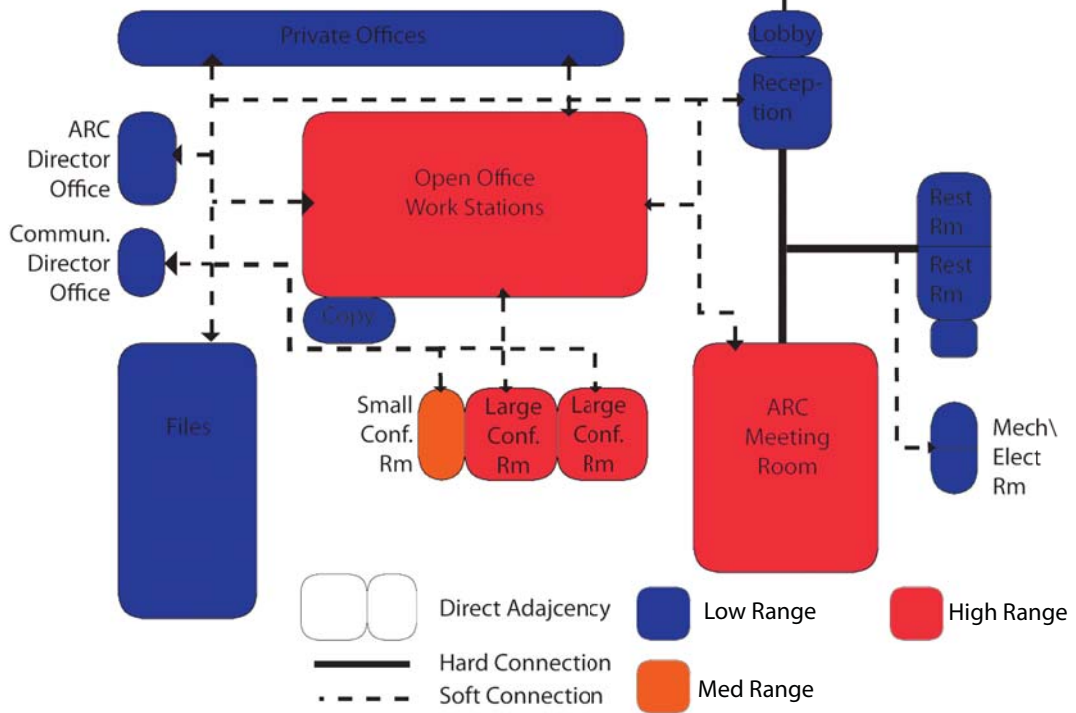


RELATIONSHIP DIAGRAMS

LIGHTING REQUIREMENTS



TEMPERATURE REQUIREMENTS



NEEDS DIAGRAMS

Books

Bernick, Michael, and Robert Cervero. Transit Villages in the 21st Century. New York City, New York: McGraw-Hill, 1997.

Kenneth W. Griffen. Building Type Basics for Transit Facilities. Hoboken, New Jersey: John Wiley & Sons, Inc, 2004

The Images Publishing Group Pty Ltd. Transport Spaces. Melbourne, Australia: The Images Publishing Group Pty Ltd, 1999

Francisco Asensio Cerver. The architecture of Stations and Terminals. New York, New York: Hearst Books International, 1997

Meadows, Meadows, Randers. Beyond the Limits. Post Mills, Vermont: Chelsea Green Publishing Company, 1992

Will Jones. New Transport Architecture. Great Britain: Octopus Publishing Group Ltd, 2006

Merrel Publishers Limited. Modern Trains and Splendid Stations. London, England: Merrel Publishers Ltd, 2001

This book provides many different case studies to study for use for precedents for the design of my thesis project.

Charles Waldheim. The Landscape Urbanism Reader. New York, New York: Princeton architectural Press, 2006

Benjamin Stein and John S. Reynolds. Mechanical and Electrical Equipment for Buildings 9th Ed.
New York, New York: John Wiley & Sons, Inc, 2000

Websites

“Atlanta Neighborhood Change Report.” Geographic Distribution. 2002. Georgia Institute of Technology. October 12, 2007 <<http://www.arch.gatech.edu/~dapa/reports/atlneighchg/page-Images>>.

“Welcome to the Atlanta Regional.” Atlanta Regional Commission 2005 Atlanta Regional Commission
October 25, 2007 <<http://www.atlantaregional.com/cps/rde/xchg/>>.

“Atlanta, Georgia Climate.” Atlanta Weather. 2004 Freed RSS World Weather
October 30, 2007 <<http://www.rssweather.com/climate/Georgia/Atlanta/>>.

“Livable Communities Coalition.” Past Projects. 2005–2006. Livable Communities.
November 1, 2007 <<http://livablecommunitiescoalition.org/home/>>.