LMAT
LABOR MARKET
ASSESSMENT TOOL

INTRODUCING THE LABOR MARKET ASSESSMENT TOOL

WHAT IS IT? The Labor Market Assessment Tool (LMAT) is the product of a partnership between the Boston Redevelopment Authority's (BRA) Research Division and the Center for Urban and Regional Policy (CURP) at Northeastern University.
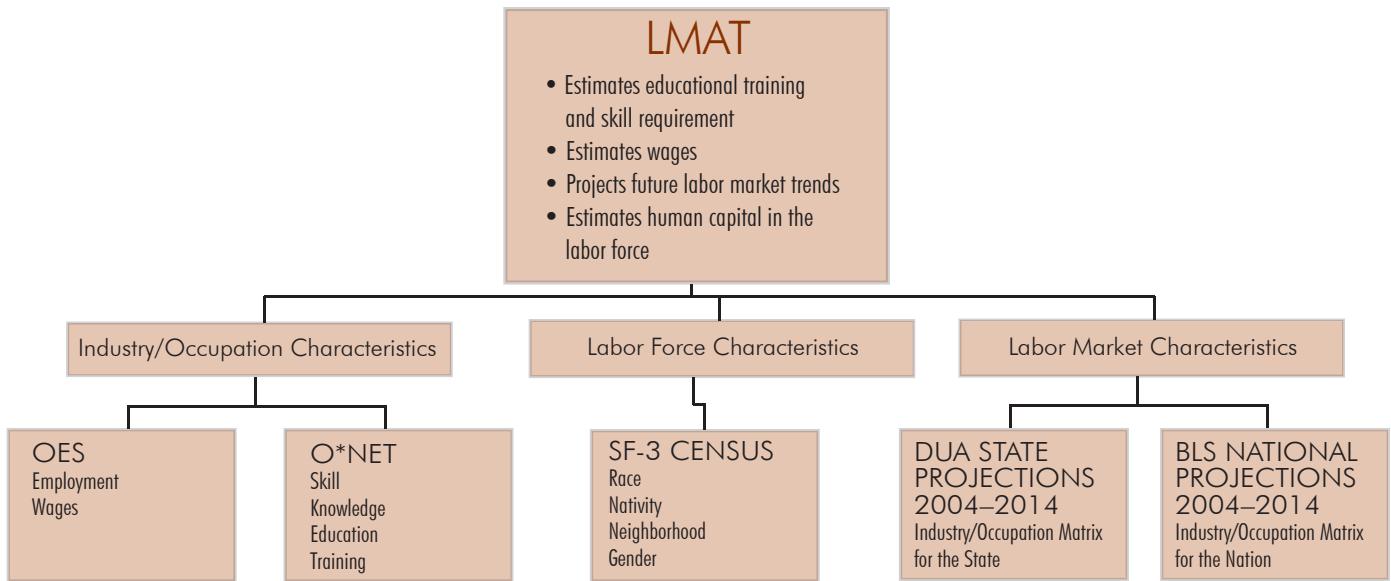
LMAT is an interactive computer-based program developed by Alan Clayton-Matthews, a CURP Senior Fellow and Associate Professor of Public Policy at the University of Massachusetts Boston with the assistance of BRA Senior Research Associate Mark Melnik, CURP's Director Barry Bluestone, and the BRA's Research Director Alvaro Lima.

The BRA Research Division collects and analyzes contemporary, historical, and comparative data related to Boston's economy, population, and commercial markets. BRA Research Division data analysis plays a critical role in informing public policy for the City of Boston related to planning, community, and economic development. In addition, the BRA Research Division acts as a resource for Boston residents, private sector groups, academic institutions, community-based organizations, and other governmental agencies.

The Center for Urban and Regional Policy (CURP) at Northeastern University is a "think and do tank"— an organization that brings together faculty, staff, and students at Northeastern to conduct research on a wide range of topics related to urban areas, focusing primarily on the Greater Boston region. CURP often works with community groups, non-profit organizations, and government agencies to collect and analyze data and inform public policy decisions.

WHAT DOES IT DO? LMAT is comprised of various secondary data sources that can be used to examine Boston's labor market. As an interactive computer program, LMAT is capable of estimating wages and the distribution of occupations by educational, skill, knowledge, and training requirements by industry. In addition, the program provides employment projections by educational, skill, knowledge, and training requirements by industry for future labor market scenarios. LMAT can be used, for example, to estimate the difference between the educational attainment and occupational structure of the current labor pool and the workforce requirements of the current labor market. LMAT can also be used to make future employment projections.

In order to do this, LMAT utilizes five different secondary data sources, allowing users to examine a combination of industrial, occupational, and labor force characteristics. To identify industrial and occupational characteristics, including the distribution of skills, wages, education, and training the program uses data developed by the U.S. Department of Labor, specifically the Occupational Employment Statistics (OES) and the Occupational Information Network (O*NET). In order to estimate labor market characteristics, LMAT uses employment data and projections developed by the Bureau of Labor Statistics (BLS) for national trends and the Massachusetts Department of Unemployment Assistance (DUA) for state trends. In order to map labor force characteristics, the program utilizes the Summary File 3 (SF-3) tables of the 2000 U.S. Census.

LMAT
- Estimates educational training and skill requirement
- Estimates wages
- Projects future labor market trends
- Estimates human capital in the labor force

Industry/Occupation Characteristics

OES
Employment
Wages

O*NET
Skill
Knowledge
Education
Training

Labor Force Characteristics

SF-3 CENSUS
Race
Nativity
Neighborhood
Gender

Labor Market Characteristics

DUA STATE PROJECTIONS 2004–2014
Industry/Occupation Matrix for the State

BLS NATIONAL PROJECTIONS 2004–2014
Industry/Occupation Matrix for the Nation

With the use of the OES, O*NET, BLS and DUA projections, and the U.S. Census SF-3 data, this computer program can estimate both the labor demands (e.g. educational require-ments, job attributes, and industry characteristics) and the characteristics of the labor supply (e.g. human capital and worker attributes). LMAT can be used to highlight the educa-tional needs and primary skills necessary to work in various occupations or selected industries. By linking together many data sources, LMAT can be used to:

- Simulate different labor market scenarios;
- Analyze the skill compatibility of a single industry, or set of industries with the population of the city;
- Compare labor supply and demand within Boston's labor market;
- Estimate labor supply and demand within projected future labor markets for the City of Boston;
- Identify critical skills as job requirements for selected industries or the entire labor market.

LMAT can be used to highlight the educational needs and primary skills necessary to work in various occupations or selected industries. It can also estimate the typical wages associated with occupations and industries, as well as identify industries and occupations that are likely to grow in the future.

WHAT IS UNIQUE ABOUT LMAT? With over 800 occupational titles, close to 1,200 industrial classifications, approximately 140 different measures of job requirements, and two different sets of employment projections for the year 2014, there are literally a countless number of ways to assess the relationship between industries, occupations, and job requirements in the labor market using LMAT. Being that industries and occupations on LMAT are organized with the most widely used classification systems, it is also possible to link LMAT outputs with other data sources that also use the North American Industrial Classification System (NAICS) and the Standard Occupational Classification (SOC) system.

In terms of looking at the labor force, U.S. Census SF-3 data allows users to look at key human capital and demographic characteristics. These data can be organized by Census Tracts, so it is possible to focus on the human capital and demographic characteristics of specific neighborhoods within the city of Boston.

In short, LMAT is an all-in-one source for analyzing occupational requirements by industry in the labor market, as well as critical demographic and human capital characteristics of the labor force. All of the data sources in LMAT are part of ongoing data collection processes. As a result, LMAT can be updated frequently to use the most up-to-date versions of OES, O*NET, BLS and DUA labor mar-ket projections, and Census data.

THE LMAT SERIES In the coming months, the Research Division at the Boston Redevelopment Authority will be unveiling a new set of reports using this interactive statistical tool. The LMAT Series will be a collection of reports focusing on the various applications of the program, including general discussions of the skill requirements and wage distributions associated with selected industries and the labor market as a whole. In addition, the LMAT Series will analyze the relationship between occupational requirements and worker attributes in Boston's population.

EXAMPLE 1

COMPARING INDUSTRIAL EDUCATIONAL REQUIREMENTS AND EDUCATIONAL ATTAINMENT OF BOSTON RESIDENTS

Required Education in Selected Industries and Educational Attainment in Boston

- Finance and Insurance
- Accomodations and Food Services
- Boston Population 2000
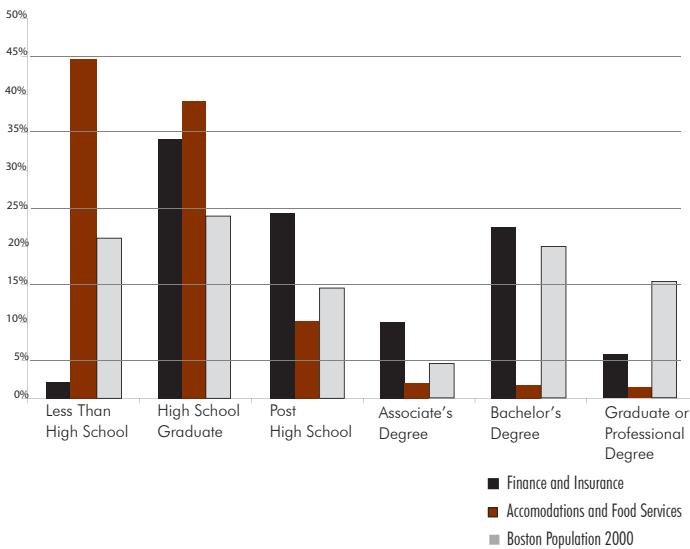
LMAT can plot the educational requirements for industries and compare them with the educational attainment of Boston's population. Here we compare the educational requirements of the Finance and Insurance Industry with that of the Accommodations and Food Services Industry and the actual educational distribution of Boston's labor force. As shown, more than 25% of the jobs in the Finance and Insurance Industry requires at least a Bachelor's Degree, while only about 5% of the jobs in the Accommodations and Food Services Industry require this much education.

EXAMPLE 2

LANGUAGE AND SKILL REQUIREMENTS IN THE LABOR MARKET

### Projected Job Growth Between 2004-2014 in Metro Boston by English Language Skill Requirements

Language Skill	Low	Med-Low	Med-High	High
Growth	2%	5.8%	9.5%	14.7%
Average Wage	$12,765	$26,853	$58,013	$69,826

The data above was part of a project the BRA Research Division worked on with the Massachusetts Immigration and Refugee Advocacy Coalition (MIRA). We used LMAT to project job growth between 2004-2014 by language skill requirements for Metro Boston, as well as the expected average wages for new jobs. As these data indicate, the number of new jobs available to individuals with low English language skills is severely limited. In addition, new jobs requiring low language skill tend to be extremely low paying. This suggests that individuals with limited English language skills will have a very difficult time finding employment in occupations that pay an adequate wage.
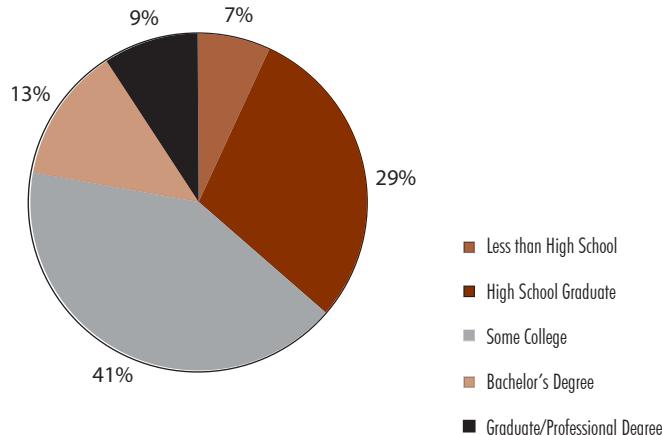
EXAMPLE 3

COMPARING THE EDUCATIONAL REQUIREMENTS OF DIFFERENT INDUSTRIES

Retail Trade
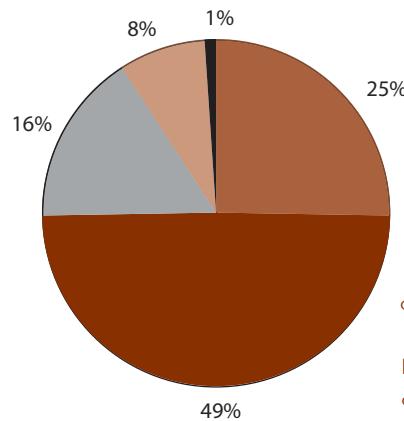
To the left we see that almost three quarters of occupations in the Retail Trade Industry require a High School Diploma or less, whereas 64% of jobs in the Health Care and Social Assistance Industry require at least some college classes.

Health Care & Social Assistance

- Less than High School
- High School Graduate
- Some College
- Bachelor's Degree
- Graduate/Professional Degree

DATA SOURCES

The Occupational Employment Statistics (OES) is based on a semian-nual mail survey administered as part of a Federal-State cooperative program between the Bureau of Labor Statistics (BLS) and State Workforce Agencies (SWAs). The OES estimates the number of people employed in various industries and their earned wages. The survey consists of six semiannual panels over a three-year period (conducted in May and November of each year). Each panel includes approximately 200,000 establishments. At the end of the three-year cycle, the OES contacts roughly 1.2 million employers. LMAT uses the May 2005 OES data set.

LMAT uses the OES data sources organized by the NAICS 3, 4, and 5 digit coding system. Each industry is assigned a numeric code in NAICS. The longer the code, the more specific the information is related to that industry. In general, the NAICS 5-digit code data set provides the most specific and narrowed set of job titles associated with a given industry. This is particularly useful when trying to understand the distribution of occupations for a proposed facility in a given industry[1].

OES data provides a full list of the occupational titles associated with each NAICS code, as well as information on the wages and number of people working in those occupations. Occupational titles in OES are categorized by the SOC system---a 6 to 8 digit code assigned to each job title. These codes are typically used to organize occupational data, including the Occupational Information Network (O*NET) and the U.S. Census. More information can be found on OES's website: http://www.bls.gov/oes/.

The Occupational Information Network (O*NET) is a new database that has replaced the Dictionary of Occupational Titles (DOT) as the main source of information on worker attributes and job characteristics associ-ated with specific job titles. O*NET provides both summary and detailed information on more than 800 occupational titles on over 400 scales that measure job characteristics[2]. The O*NET Data Collection Program is an ongoing project. Data are collected on roughly 200 occupational titles per year, with the goal of replenishing the data set every five years. The first cycle of data collection is scheduled for completion in December 2007. This software package utilizes O*NET version 11.0[3].

LMAT uses four main parts of the O*NET database: skills (35 items), knowledge (33 items), educational requirements, and job zone. The data on skills, knowledge, and educational requirements are primarily based on incumbent ratings of job characteristics[4]. For skills and knowledge, respon-dents are asked a series of questions regarding the level[5] and importance[6] of characteristics related to the job. In terms of educational requirements, incumbents are asked the level of education necessary to perform their job.

Additionally, O*NET classifies occupational titles by job zone. For each occupation, the job zone classification indicates the education, job training, overall experience, examples of other occupations within the same job zone, and Specific Vocational Preparation (SVP) scores[7]. O*NET Online classifies occupations into five different job zones. The lower the job zone number, the less training, education, and previous work experience needed to perform the job.

Bureau of Labor Statistics 2014 Projections
LMAT includes Bureau of Labor Statistics (BLS) bi-annual national employ-ment projections by industry and occupation for the years 2004-2014. These projections can be used to estimate potential shifts in the industrial, occupational, and/or demand-side of the labor market. More information regarding the BLS projections can be found at: http://www.bls.gov/emp/.

Massachusetts Division of Unemployment Assistance 2014 Projections
LMAT also utilizes industry and occupation projections for the Common-wealth for the years 2004-2014. These projections are a combination of information provided by the Massachusetts Division of Unemployment Assistance (DUA) and the Commonwealth's Wages and Employment (ES 202) data. These projections can be used to estimate potential shifts in the industrial and occupational distrubution of the labor market.

Summary File 3 Tables of the 2000 U.S. Census (SF-3)
In order to estimate basic labor force characteristics, LMAT uses the Sum-mary File 3 Tables of the 2000 U.S. Census (SF-3). The SF-3 tables provide a detailed sketch of the key demographic and human capital characteristics for a specifically defined geographic region. These data are available at the Census Tract level. Examples of economic and demographic variables available within the SF-3 tables include: race, gender, nativity status, age, ethnicity, educational attainment, labor force status, and earnings. More information regarding the Census can be found at: http://www.census.gov/main/www/cen2000.html.

END NOTES

1 The NAICS 5-digit code data set does not have information on all possible industries. In those instances, it would be necessary to use either the NAICS 4-digit code or 3-digit code data.

2 Job attribute data are organized by 12 different groupings-skills, tasks, abilities, work activities, work context, job zone, educational requirement, personal interests, work style, work value, related occupations, and wages-measured by a varying number of characteristics.

3 O*NET data are collected in two stages. First, establishments that are expected to employ people in the targeted occupational titles are randomly selected. Next, a random sample of workers in the targeted occupational titles are chosen to answer standardized questionnaires. All workers selected are asked questions related to job tasks and demographics. Beyond that, each worker selected is given one of four surveys related to specifics about the job---either on skills, knowledge, generalized work activities, or work context.

4 Initially, O*NET data consisted of job analysts' ratings on various occupa-tional titles associated with the DOT. Starting in 2001, O*NET began a new data collection program that surveyed actual workers on the various attributes associated with their job.

5 The level questions are scored on a 0-7 scale, where 7 means the job requires high levels of the skill measured and zero means it requires no skill.

6 The importance questions are scored on a 1-5 scale, where 5 indicates that the skill measured is extremely important to the occupation and 1 means it not important at all.

7 SVP is used in the Dictionary of Occupational Titles as a measure of the amount of time need to acquire the necessary skills to work in an occupa-tion. SVP is measured on a 1-9 scale. The higher the number, the more training and education necessary to work in the occupation. The Job Zone classifications on O*NET were developed to transition from SVP scores, as a measures of the experience, education, and job training necessary to work in various occupations.