Memorandum

Human Resources Division

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TO:	Todd Rent, Chief Examiner Civil Service Commission
FROM:	Human Resources Staff
RE:	Establish a Passing Score for the Economic Development Coordinator register
DATE:	April 15, 2015

A. Summary

Staff recommends a passing score of 40%. This would result in an eligibility register of 16 candidates.

B. Background

The position was open for applications from Feb. 24 – March 20, 2015; in response, the City received 22 applications for the position. Applicant demographics are as follows:
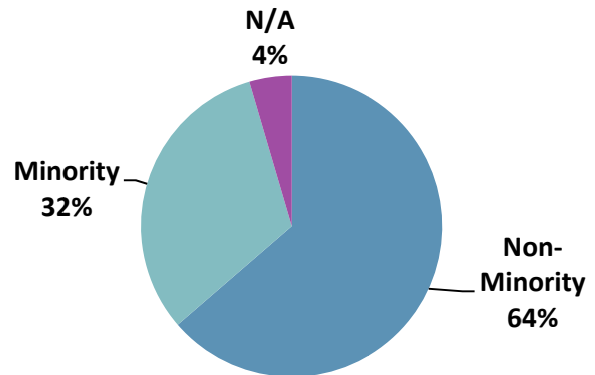
Figure 1

Applicants by Gender
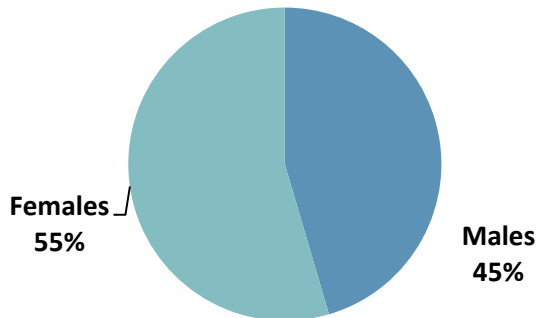
Male	10	45%
Female	12	55%

Applicants by Race

Non-Minority	14	64%
Minority	7	32%
N/A	1	5%

C. Passing Score and Recommendation

The scoring plan (see Appendix A, *Economic Development Coordinator Scoring Plan/Application Questions*) is based on the minimum and preferred qualifications of the position. The highest score achieved was 17 (81%) and the lowest was 0; the average score was 11 (52%) and the median score was 12 (57%). Candidates not recommended to be listed on the eligibility register are demographically represented as follows:
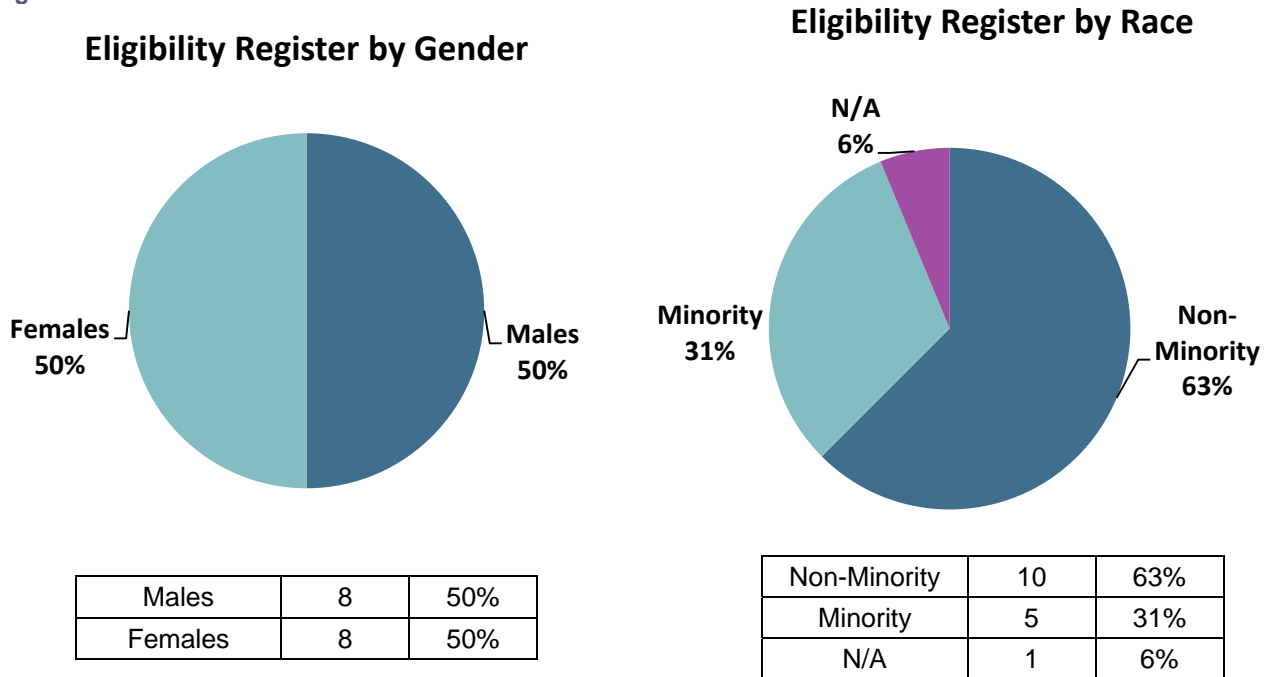
Table 1

Male	2
Female	4

Non-Minority	2
Minority	4

The hiring manager for this position supports the recommendation of a 40% passing score. Further, disparate impact is not evident (see Attachment B, *Disparate Impact Report*).

Figure 2

Eligibility Register by Gender

Eligibility Register by Race

Males	8	50%
Females	8	50%

Non-Minority	10	63%
Minority	5	31%
N/A	1	6%

Appendix A: Economic Development Coordinator Scoring Plan (Application Questions)

1. What is the highest level of education you have completed?

a. Some college/associate's degree. **(0)**
b. Bachelor's degree in Economics, Urban planning, Public or Business Administration, Finance, or a closely related field. **(2)**
c. Bachelor's degree in an unrelated field. **(1)**
d. Master's degree in Economics, Urban planning, Public or Business Administration, Finance, or a closely related field. **(4)**
e. Master's degree in an unrelated field. **(1)**
f. None of the above. **(0)**

2. This position requires at least two years of related professional experience or a master's degree and one year of experience. Do you meet this minimum requirement? Note: "Professional experience" means full-time paid experience; part-time experience including internships may be accumulated and pro-rated to meet the total experience requirements. (Please be sure to detail your experience in the Work Experience section of the application to receive full credit).

a. Yes **(2)**
b. No **(0)**

2b. If you answered yes, please describe your experience:

3. Preference: Do you have relevant public sector experience? (Please be sure to detail your experience in the Work Experience section of the application to receive full credit.)

    a. Yes, professional experience **(2)**
    b. Yes, at least one internship **(1)**
    c. No **(0)**

    3b. If you answered yes, please describe your experience:

4. Do you have experience with Tax Increment Financing, Enterprise Zones, and/or other economic development incentive programs?

    a. Yes, strong experience **(3)**
    b. Yes, some experience **(2)**
    c. Coursework only **(1)**
    d. No **(0)**

    4b. If you answered yes, please describe your knowledge/experience:

5. Do you have advanced proficiency in any of the following? (Please check all that apply)—**1 pt. each.**

- Microsoft Office
- ESRI ArcGIS
- Microsoft Access
- Adobe Creative Suite

    5b. If you answered yes for ESRI ArcGIS, please briefly explain if your experience is based on classroom work or direct, professional experience, what type(s) of mapping or analysis you performed, and which employer or class you gained this experience through, if applicable.

6. Do you have experience writing professional reports?

    a. Yes, strong experience **(3)**
    b. Yes, some experience **(2)**
    c. Coursework only **(1)**
    d. No **(0)**

    6b. If you answered yes, please briefly explain if your experience is based on classroom work or direct, professional experience, what type(s) of reports you created, and which employer you gained this experience through, if applicable.

7. Do you have professional experience working with businesses and business groups?

    a. Yes, strong experience **(3)**
    b. Yes, some experience **(2)**
    c. Coursework only **(1)**
    d. No **(0)**

    7b. If yes, please summarize your experience:

8. Please attach one page specifically explaining how your prior work experience and education match the qualifications for this position.

Disparate Impact Analysis
(an On-Line Internet based application)

Instructions: Please fill out the information into the form below. Once you have entered your data below, you may select the types of analysis to be conducted by checking the appropriate boxes. Then press the compute button at the bottom of the form to view the results.

Select the type of employment decision: [Selection ▾]
Enter a title for your report: [Economic Development Coordinator (2015)]

Number of Male		Number of Non-Minority		Number of Younger		Number of Non-Disabled	
10	Applicants	14	Applicants		Applicants		Applicants
8	Selected	10	Selected		Selected		Selected
Number of Female		**Number of Minority**		**Number of Older**		**Number of Disabled**	
12	Applicants	8	Applicants		Applicants		Applicants
8	Selected	5	Selected		Selected		Selected

☑ -Adverse Impact
☑ -Chi-Square
☑ -Standard Deviation
☑ -Confidence Intervals
☑ Probability Distribution

Select the Statistical Tests you wish to execute by checking or unchecking the boxes on the left. Then press the 'Compute' button below.

[Compute]

Display: ☑ Description of Statistic ☑ Interpretation of Results

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Economic Development Coordinator (2015)

Adverse-Impact Report

Adverse Impact and the **"four-fifths rule."** - A selection rate for any race, sex, or ethnic group which is less than four-fifths (4/5ths) (or eighty percent) of the rate for the group with the highest rate will generally be regarded by the Federal enforcement agencies as evidence of adverse impact. *Uniform Guidelines on Employee Selection Procedures*

Rate of Females Applicants Selected	Rate of Males Applicants Selected	Adverse Impact Ratio for Females	Adverse Impact Ratio for Males
(8/ 12) = 0.6667	(8/ 10) = 0.8	(0.6667/ 0.8)= 0.83	(0.8/ 0.6667)= 1.2
Adverse impact as defined by the 4/5ths rule was not found in the above data.			

Rate of Minorities Applicants Selected	Rate of Non-Minorities Applicants Selected	Adverse Impact Ratio for Minorities	Adverse Impact Ratio for Non-Minorities
(5/ 8) = 0.625	(10/ 14) = 0.7143	(0.625/ 0.7143)= 0.88	(0.7143/ 0.625)= 1.14
Adverse impact as defined by the 4/5ths rule was not found in the above data.			

Chi-Square Report

Observed Expected	Selected	Not Selected	Row Totals
Males	8 7.2727	2 2.7273	10
Females	8 8.7273	4 3.2727	12
Column Total	16	6	22

Chi-Square = 0.4889
The value of the statistic is less than 3.841. This indicates that there is a 95 percent chance that these results have been obtained absent any form of bias. Therefore, you may conclude that these results fall within normal random variations and are not the result of bias.

Observed Expected	Selected	Not Selected	Row Totals

Non-Minorities	10 9.5455	4 4.4545	14
Minorities	5 5.4545	3 2.5455	8
Column Total	15	7	22

Chi-Square = 0.1871
The value of the statistic is less than 3.841. This indicates that there is a 95 percent chance that these results have been obtained absent any form of bias. Therefore, you may conclude that these results fall within normal random variations and are not the result of bias.

Standard-Deviation Report

The difference between the proportion of the protected class Selected and the proportion of all Applicants Selected has a normal distribution with a mean and standard deviation. The statistic is shown below:

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        (r / n) - p

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sqrt(p * (1-p) / n) * sqrt(1-q)
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Analysis of proportion of Females Selected where:

- **r = number of Females Selected.**
- **n = number of Selected (Females and Males).**
- **p = proportion of Applicants that are Females.**
- **q = proportion of Applicants Selected.**

	Selected	Not Selected	Row Totals
Males	8	2	10
Females	8	4	12
Column Total	16	6	22

r = 8
n = 16
p = 12 / 22 = 0.545
q = (8 + 8) / (12 + 10) = 0.727

Standard Deviation Statistic = -0.699

These results show that the proportion of Females Selected is -0.699 standard deviations below the proportion of Applicants Selected. A result of less than 2 standard deviations is generally considered non-significant.

Analysis of proportion of Minorities Selected where:

- **r = number of Minorities Selected.**
- **n = number of Selected (Minorities and Non-Minorities).**
- **p = proportion of Applicants that are Minorities.**
- **q = proportion of Applicants Selected.**

	Selected	Not Selected	Row Totals
Non-Minorities	10	4	14
Minorities	5	3	8
Column Total	15	7	22

r = 5
n = 15
p = 8 / 22 = 0.364
q = (5 + 10) / (8 + 14) = 0.682

Standard Deviation Statistic = -0.433

These results show that the proportion of Minorities Selected is -0.433 standard deviations below the proportion of Applicants Selected. A result of less than 2 standard deviations is generally considered non-significant.

Confidence Interval Report

The proportion of the protected class Selected has an expected value that would fall within a specified confidence interval.
The statistic is shown below:
Observed value = (r / n)
Expected value = p

Standard Deviation = sqrt(p * (1-p) / n) * sqrt(1-q)

Confidence Interval:
Lower Bound = p - 1.96 * Std Dev
Upper Bound = p + 1.96 * Std Dev

Analysis of proportion of Females Applicants Selected **where:**

- **r = number of Females Selected.**
- **n = number of Applicants Selected.**
- **p = proportion of Females among those Selected.**
- **q = proportion of Applicants Selected.**

r = 8
n = 16
p = (12/(12+10))=0.545
q = ((8 + 8)/(12 + 10))=0.727
(r/n)=8/16=0.5

The lower bound of the confidence interval is: 0.545 -(1.96* 0.065)= 0.418
The upper bound of the confidence interval is: 0.545 +(1.96* 0.065)= 0.6729

Confidence Interval = 0.418 to 0.6729

These results show that the proportion of Females Females (r/n=0.5) is contained in the confidence interval. Therefore a finding of disparate impact is not supported by this data.

Analysis of proportion of Minorities Applicants Selected **where:**

- **r = number of Minorities Selected.**
- **n = number of Applicants Selected.**
- **p = proportion of Minorities among those Selected.**
- **q = proportion of Applicants Selected.**

r = 5
n = 15
p = (8/(8+14))=0.364
q = ((5 + 10)/(8 + 14))=0.682
(r/n)=5/15=0.3333

The lower bound of the confidence interval is: 0.364 -(1.96* 0.07)= 0.2263
The upper bound of the confidence interval is: 0.364 +(1.96* 0.07)= 0.501

Confidence Interval = 0.2263 to 0.501

These results show that the proportion of Minorities Minorities (r/n=0.3333) is contained in the confidence interval. Therefore a finding of disparate impact is not supported by this data.

Probability Distribution Report

| Number Females Selected	Number Males Selected	Rate of Females Applicants Selected	Rate of Males Applicants Selected	Adverse Impact Ratio of Females	Adverse Impact against Females ?	Probability	Cumulative Probability
6	10	(6/12)	(10/10)	0.5	YES	0.012384	0.012384
7	9	(7/12)	(9/10)	0.6481	YES	0.106148	0.118532
Selected-> 8	8	(8/12)	(8/10)	0.8333	NO	0.29854	0.417072
9	7	(9/12)	(7/10)	1.0714	NO	0.353826	0.770898
10	6	(10/12)	(6/10)	1.3889	NO	0.185759	0.956656
11	5	(11/12)	(5/10)	1.8333	NO	0.040529	0.997185
12	4	(12/12)	(4/10)	2.5	NO	0.002815	1

Given that 16 were Selected from a pool of 10 Males and 12 Females it was possible to have Selected from 6 to 12 Females.

Adverse Impact would be found if you Selected 7 or fewer Females.

The probability of Adverse Impact occurring even if the employment decisions were random (i.e. unbiased) is 0.1185 (the sum of the probabilities of having Selected 7 or fewer Females).

Since the probability of Adverse Impact occurring even if the employment decisions were random (i.e. unbiased) is greater than 10%, an observed Adverse Impact may be not significant since the probability is greater than 1 in 10 that Adverse Impact would have occurred due to chance.

Probability Distribution of the variable: Number of Females Selected.


Number of female
Applicants Selected
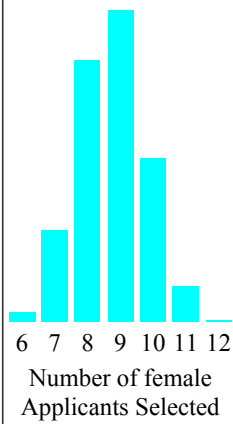
The probability distribution of having Selected from 6 to 12 Females is displayed above. The graph above is shown starting with 6 since the probabilities below this point are near zero. As can be seen, the most likely event (highest probability) to have occurred by chance (or decisions not affected by any form of bias) is to have Selected 9 female Applicants. This represents the mean of the probability distribution. Approximately half of the probability distribution is above this point and approximately half is below this point. The total area contained in the probability distribution is equal to 1. Thus, probabilities for each number of female Applicants Selected are a fraction of the total probability distribution. The larger areas of the distribution represent higher probabilities of occurance. Adding the individual probabilities up to a certain point enable you to compute the probability of having Selected that many or fewer female Applicants. Adding the individual probabilities from a certain point and higher enable you to compute the probability of having Selected that many or more female Applicants.

The characteristics of the probability distribution--its mean and standard deviation--are a function of the number of female and male Applicants and the number of Applicants to be Selected. Though it is possible to have Selected from 6 to 12 female Applicants, the individual probabilities of having Selected each number of female Applicants can be computed and accumulated. As noted before, these individual probabilities are a function of the number of female and male Applicants and the number of Applicants to be Selected.

Using the distribution above, a 90 percent confidence interval on the variable 'Number of Females Selected' would have a lower bound of 7 and an upper bound of 10.

The significance of having Selected 8 or fewer Females is graphically displayed below.
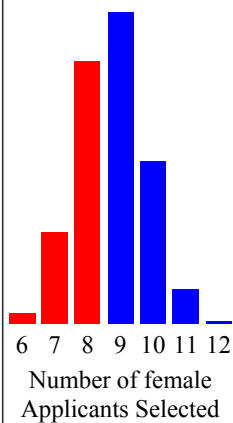
Number of female
Applicants Selected

As noted earlier, Adverse Impact, according to the 4/5ths rule, would be found if you Selected 7 *or fewer* female Applicants.

You have Selected 8 female Applicants. The probability of having Selected 8 *or fewer* Females is equal to the cumulative probability for having Selected 8 Females Applicants. The cumulative probability of having Selected 8 female Applicants is 0.4171 and is graphically displayed, in red, above.

Since the probability is greater than 10%, we are unable to reject the hypothesis that the decisions occurred due to chance. Therefore, we must conclude that it is entirely possible that having Selected 8 or fewer female Applicants is an event that occurred due to chance and not from discriminatory actions by the employer.

| Number Minorities Selected	Number Non-Minorities Selected	Rate of Minorities Applicants Selected	Rate of Non-Minorities Applicants Selected	Adverse Impact Ratio of Minorities	Adverse Impact against Minorities ?	Probability	Cumulative Probability
1	14	(1/8)	(14/14)	0.125	YES	0.000047	0.000047
2	13	(2/8)	(13/14)	0.2692	YES	0.002299	0.002345
3	12	(3/8)	(12/14)	0.4375	YES	0.029881	0.032226
4	11	(4/8)	(11/14)	0.6364	YES	0.149404	0.181631
Selected-> 5	10	(5/8)	(10/14)	0.875	NO	0.328689	0.51032
6	9	(6/8)	(9/14)	1.1667	NO	0.328689	0.839009
7	8	(7/8)	(8/14)	1.5313	NO	0.140867	0.979876
8	7	(8/8)	(7/14)	2	NO	0.020124	1

Given that 15 were Selected from a pool of 14 Non-Minorities and 8 Minorities it was possible to have Selected from 1 to 8 Minorities.

Adverse Impact would be found if you Selected 4 or fewer Minorities.

The probability of Adverse Impact occurring even if the employment decisions were random (i.e. unbiased) is 0.1816 (the sum of the probabilities of having Selected 4 or fewer Minorities).

Since the probability of Adverse Impact occurring even if the employment decisions were random (i.e. unbiased) is greater than 10%, an observed Adverse Impact may be not significant since the probability is greater than 1 in 10 that Adverse Impact would have occurred due to chance.

## Probability Distribution of the variable: Number of Minorities Selected.
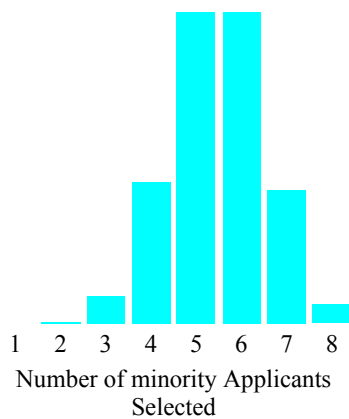
The probability distribution of having Selected from 1 to 8 Minorities is displayed above. The graph above is shown starting with 1 since the probabilities below this point are near zero. As can be seen, the most likely event (highest probability) to have occurred by chance (or decisions not affected by any form of bias) is to have Selected 6 minority Applicants. This represents the mean of the probability distribution. Approximately half of the probability distribution is above this point and approximately half is below this point. The total area contained in the probability distribution is equal to 1. Thus, probabilities for each number of minority Applicants Selected are a fraction of the total probability distribution. The larger areas of the distribution represent higher probabilities of occurance. Adding the individual probabilities up to a certain point enable you to compute the probability of having Selected that many or fewer minority Applicants. Adding the individual probabilities from a certain point and higher enable you to compute the probability of having Selected that many or more minority Applicants.

The characteristics of the probability distribution--its mean and standard deviation--are a function of the number of minority and non-minority Applicants and the number of Applicants to be Selected. Though it is possible to have Selected from 1 to 8 minority Applicants, the individual probabilities of having Selected each number of minority Applicants can be computed and accumulated. As noted before, these individual probabilities are a function of the number of minority and non-minority Applicants and the number of Applicants to be Selected.

Using the distribution above, a 90 percent confidence interval on the variable 'Number of Minorities Selected' would have a lower bound of 4 and an upper bound of 7.

The significance of having Selected 5 or fewer Minorities is graphically displayed below.
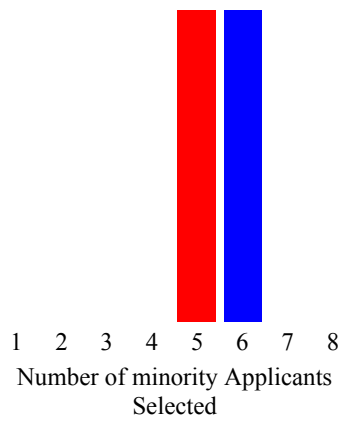
1   2   3   4   5   6   7   8

Number of minority Applicants
Selected

As noted earlier, Adverse Impact, according to the 4/5ths rule, would be found if you Selected 4 *or fewer* minority Applicants.

You have Selected 5 minority Applicants. The probability of having Selected 5 *or fewer* Minorities is equal to the cumulative probability for having Selected 5 Minorities Applicants. The cumulative probability of having Selected 5 minority Applicants is 0.5103 and is graphically displayed, in red, above.

Since the probability is greater than 10%, we are unable to reject the hypothesis that the decisions occurred due to chance. Therefore, we must conclude that it is entirely possible that having Selected 5 or fewer minority Applicants is an event that occurred due to chance and not from discriminatory actions by the employer.

View Source Code

Send questions or comments to webmaster@hr-guide.com. Thank you.

Friday, April 10, 2015